

APPENDIX A: IPH – Stakeholders List

Addenbrooke's NHS Trust
Aintree Hospitals NHS Trust
Association for Perioperative Practice
Association of Anaesthetists of Great Britain and Ireland
Association of Paediatric Anaesthetists of Great Britain and Ireland
Association of the British Pharmaceutical Industry (ABPI)
Barnsley Acute Trust
Barnsley PCT
Brighton & Sussex University Hospitals Trust
British Association of Day Surgery
British Association of Paediatric Surgeons
British Geriatrics Society
British National Formulary (BNF)
BUPA
Caldedale PCT
CASPE
Central Medical Supplies Ltd
Commission for Social Care Inspection
Connecting for Health
Conwy & Denbighshire NHS Trust
Coventry and Warwickshire Cardiac Network
David Lewis Centre, The
Department of Health
Department of Health, Social Security and Public Safety of Northern Ireland
East and North Hertfordshire NHS Trust
Great Ormond Street Hospital for Children NHS Trust
Guys & St Thomas NHS Trust
Health and Safety Executive
Health Protection Agency
Health Protection Scotland
Healthcare Commission
Heart of England NHS Foundation Trust
Inditherm Medical
KCI Medical Ltd
Kimal Plc
Kimberly-Clark Health Care
King's College Hospital NHS Trust
Luton and Dunstable Hospital NHS Trust

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Maidstone and Tunbridge Wells NHS Trust
Medicines and Healthcare Products Regulatory Agency (MHRA)
National Association of Assistants in Surgical Practice
National Patient Safety Agency
National Public Health Service – Wales
NCCHTA
NCEPOD
NHS Health and Social Care Information Centre
NHS Plus
NHS Purchasing & Supply Agency
NHS Quality Improvement Scotland
Northwest London Hospitals NHS Trust
Nottingham City PCT
Papworth Hospital NHS Trust
Pennine Healthcare
PERIGON (formerly The NHS Modernisation Agency)
Peterborough & Stamford NHS Hospitals Trust
Queen Victoria Hospital NHS Foundation Trust
Regional Public Health Group - London
Royal Brompton and Harefield NHS Trust
Royal College of Anaesthetists
Royal College of Midwives
Royal College of Nursing (RCN)
Royal College of Paediatrics and Child Health
Royal College of Pathologists
Royal College of Surgeons of England
Royal Society of Medicine
Scottish Intercollegiate Guidelines Network (SIGN)
Sheffield South West PCT
Sheffield Teaching Hospitals NHS Trust
Society of Cardiothoracic Surgeons
Staffordshire Moorlans PCT
Stockport PCT
Tameside and Glossop Acute Services NHS Trust
Tyco Healthcare
University College London Hospitals NHS Trust
University Hospital Birmingham NHSFT
University of Cardiff
Walsall Teaching PCT
Welsh Assembly Government (formerly National Assembly for Wales)

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Welsh Scientific Advisory Committee (WSAC)

Withybush Hospital

York Hospitals NHS Trust

APPENDIX B: SEARCH STRATEGIES AND DATABASES SEARCHED

This appendix details the search strategies used in the identification of relevant studies for the guideline on Inadvertent Perioperative Hypothermia (IPH). A broad search was carried out initially to encompass the whole topic of this guideline. This was supplemented where necessary with more specific searches.

The National Collaborating Centre for Nursing and Supportive Care (NCC-NSC) conducted all searches on the following databases: Medline, Embase, Cinahl (using the OVID interface) and The Cochrane Library.

All searches were performed for articles published since the inception of each database.

Search filters were applied where appropriate, including filters for randomised controlled trials (RCT) and systematic reviews (SR). The RCT filter used was based on that recommended by Cochrane (Higgins, 2005). An exclusions filter was designed to remove irrelevant results.

The search strategies are reproduced below. Note that the searches make use of the controlled vocabulary which varies between databases and between search interfaces. Amendments were made where necessary in order to take these variations into account.

Where possible, searches were restricted to articles written in English. All searches were updated to August 2007.

Hand searching was not undertaken by the NCC-NSC following NICE advice that exhaustive searching on every guideline review topic is not practical (Mason et al., 2002). Reference lists of articles were checked for further articles of potential relevance.

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RCT Filter

The following filter is based on that recommended in the Cochrane Handbook (Higgins, 2005).

Medline

1	randomized controlled trial.pt.
2	controlled clinical trial.pt.
3	randomized controlled trials/
4	random allocation/
5	double blind method/
6	single blind method/
7	or/1-6
8	animals/ not humans/
9	7 not 8
10	clinical trial.pt.
11	exp clinical trials/
12	(clin\$ adj25 trial\$).ti,ab.
13	((singl\$ or doubl\$ or trebl\$ or tripl\$) adj25 (blind\$ or mask\$)).ti,ab.
14	placebos/
15	placebo\$.ti,ab.
16	random\$.ti,ab.
17	research design/
18	or/10-17
19	18 not 8
20	19 not 9
21	9 or 20

Embase

- 1 exp randomized controlled trial/
- 2 (random\$ or placebo\$).ti,ab.
- 3 ((singl\$ or doubl\$ or trebl\$ or tripl\$) adj25 (blind\$ or mask\$)).ti,ab.
- 4 (clin\$ adj25 trial\$).ti,ab.
- 5 exp comparative study/
- 6 exp evaluation/
- 7 exp follow up/
- 8 exp prospective study/
- 9 (control\$ or prospective\$ or volunteer\$).ti,ab.
- 10 or/1-9
- 11 exp human/
- 12 10 and 11

Cinahl

- 1 exp clinical trials/
- 2 clinical trial.pt.
- 3 (clin\$ adj25 trial\$).ti,ab.
- 4 ((singl\$ or doubl\$ or trebl\$ or tripl\$) adj25 (blind\$ or mask\$)).ti,ab.
- 5 (random\$ or placebo\$).ti,ab.
- 6 random assignment/
- 7 placebos/
- 8 quantitative studies/
- 9 (control\$ or prospective\$ or volunteer\$).ti,ab.
- 10 or/1-9

SR Filter

Medline / Embase

1	review.pt. or review.ti.
2	(systematic\$ or evidence\$ or methodol\$ or quantitativ\$ or analys\$ or assessment\$).ti,sh,ab.
3	1 and 2
4	meta-analysis.pt.
5	meta-analysis/
6	(meta-analy\$ or metanaly\$ or metaanaly\$ or meta analy\$).ti,ab.
7	((systematic\$ or evidence\$ or methodol\$ or quantitativ\$) adj5 (review\$ or survey\$ or overview\$)).ti,ab,sh.
8	((pool\$ or combined or combining) adj2 (data or trials or studies or results)).ti,ab.
9	or/3-8

Cinahl

- 1 review.pt. or review.ti. or "systematic review".pt.
- 2 (systematic\$ or evidence\$ or methodol\$ or quantitativ\$ or analys\$ or assessment\$).ti,sh,ab.
- 3 1 and 2
- 4 meta-analysis/
- 5 (meta-analy\$ or metanaly\$ or metaanaly\$ or meta analy\$).ti,ab.
- 6 ((systematic\$ or evidence\$ or methodol\$ or quantitativ\$) adj5 (review\$ or survey\$ or overview\$)).ti,ab,sh.
- 7 ((pool\$ or combined or combining) adj2 (data or trials or studies or results)).ti,ab.
- 8 or/1-7

Exclusions Filter

The following filter was designed to remove irrelevant results from searches. If used it was combined into search strategies using the NOT operator.

Medline / Embase / Cinahl

1	letter.pt.
2	letter/
3	letter\$/
4	editorial.pt.
5	historical article.pt.
6	anecdote.pt.
7	commentary.pt.
8	note.pt.
9	case report/
10	case report\$.pt.
11	case study/
12	case study.pt.
13	exp animal/ not human/
14	nonhuman/
15	exp animal studies/
16	animals, laboratory/
17	exp experimental animal/
18	exp animal experiment/
19	exp animal model/
20	exp rodentia/
21	exp rodents/
22	exp rodent/
23	or/1-22

Broad IPH Search

The following search strategies were combined with the exclusions filter described above. They were limited by RCT and SR study design filters.

Medline

- 1 exp hypothermia/
- 2 exp body temperature regulation/
- 3 hypo?therm\$.mp.
- 4 normo?therm\$.mp.
- 5 thermo?regulat\$.mp.
- 6 ((thermal or temperature) adj2 (regulat\$ or manage\$ or maintain\$)).mp.
- 7 exp piloerection/
- 8 exp shivering/
- 9 shiver\$.mp.
- 10 (low\$ adj2 temperature\$).mp.
- 11 thermo?genesis.mp.
- 12 (pre?warm\$ or re?warm\$).mp.
- 13 (warm\$ adj3 (patient\$ or passive\$ or active\$ or fluid\$ or gas\$ or skin or surg\$)).mp.
- 14 (warm\$ adj device\$).mp.
- 15 (core adj2 (thermal or temperature\$)).mp.
- 16 exp hyperthermia, induced/
- 17 (heat adj2 (preserv\$ or loss or retention or retain\$ or balance)).mp.
- 18 or/1-17

Embase

- 1 exp hypothermia/
- 2 accidental hypothermia/
- 3 thermoregulation/
- 4 hypo?therm\$.mp.
- 5 normo?therm\$.mp.
- 6 thermo?regulat\$.mp.
- 7 ((thermal or temperature) adj2 (regulat\$ or manage\$ or maintain\$)).mp.
- 8 piloerection.mp.
- 9 shivering/
- 10 shiver\$.mp.
- 11 (low\$ adj2 temperature\$).mp.
- 12 thermo?genesis.mp.
- 13 exp thermogenesis/
- 14 (pre?warm\$ or re?warm\$).mp.
- 15 warming/
- 16 (warm\$ adj3 (patient\$ or passive\$ or active\$ or fluid\$ or gas\$ or skin or surg\$)).mp.
- 17 (warm\$ adj device\$).mp.
- 18 (core adj2 (thermal or temperature\$)).mp.
- 19 hyperthermic therapy/
- 20 (heat adj2 (preserv\$ or loss or retention or retain\$ or balance)).mp.
- 21 or/1-20

Cinahl

- 1 exp hypothermia/
- 2 exp body temperature regulation/
- 3 hypo?therm\$.mp.
- 4 normo?therm\$.mp.
- 5 thermo?regulat\$.mp.
- 6 ((thermal or temperature) adj2 (regulat\$ or manage\$ or maintain\$)).mp.
- 7 piloerection.mp.
- 8 shivering/
- 9 shiver\$.mp.
- 10 (low\$ adj2 temperature\$).mp.
- 11 thermo?genesis.mp.
- 12 (pre?warm\$ or re?warm\$).mp.
- 13 warming techniques/
- 14 (warm\$ adj3 (patient\$ or passive\$ or active\$ or fluid\$ or gas\$ or skin or surg\$)).mp.
- 15 (warm\$ adj device\$).mp.
- 16 (core adj2 (thermal or temperature\$)).mp.
- 17 hyperthermia, induced/
- 18 (heat adj2 (preserv\$ or loss or retention or retain\$ or balance)).mp.
- 19 or/1-18

The Cochrane Library

- #1 hypo*therm* or normo*therm* or thermo*regulat* or thermo*genesis or piloerection or shiver* or pre*warm* or re*warm*
- #2 ((thermal or temperature) near/2 (regulat* or manage* or maintain*))
- #3 low* near/2 temperature*
- #4 (warm* near/3 (patient* or passive* or active* or fluid* or gas* or skin or surg*))
- #5 warm* next device*
- #6 (core near/2 (thermal or temperature*))
- #7 ((local* or therap* or induce*) near/2 hyperthermia)
- #8 (heat near/2 (preserv* or loss or retention or retain* or balance))
- #9 (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8)

Physiology of IPH

The following "quick and dirty" search was used to retrieve supplementary papers on the physiology of IPH and mechanisms of heat loss.

Medline

- 1 exp *body temperature regulation/ph
- 2 limit 1 to (humans and english language)
- 3 limit 2 to "review articles"
- 4 heat loss.mp.
- 5 limit 4 to (humans and english language and "review articles")
- 6 3 and 4
- 7 (mechanism\$ adj2 heat los\$).ti,ab.
- 8 limit 7 to (humans and english language)
- 9 2 and 7
- 10 exp *anesthesia/
- 11 10 or su.fs.
- 12 3 and 11
- 13 5 or 6 or 8 or 8 or 12

Risk Factors for IPH

Medline

- 1 (risk\$ adj2 (factor\$ or assessment\$)).mp.
- 2 (logistic\$ adj model\$).mp.
- 3 exp risk/
- 4 exp causality/
- 5 et.fs.
- 6 or/1-4
- 7 exp hypothermia/et
- 8 hypo?therm\$.ti,ab.
- 9 normo?therm\$.ti,ab.
- 10 thermo?regulat\$.ti,ab.
- 11 or/7-10
- 12 6 and 11
- 13 exp hypothermia/
- 14 or/1-5
- 15 13 and 14
- 16 12 or 15
- 17 exp anesthesia/
- 18 su.fs.
- 19 exp surgical procedures, operative/
- 20 or/17-19
- 21 16 and 20

Embase

- 1 (risk\$ adj2 (factor\$ or assessment\$)).mp.
- 2 (logistic\$ adj model\$).mp.
- 3 exp risk/
- 4 exp etiology/
- 5 et.fs.
- 6 or/1-4
- 7 exp hypothermia/et
- 8 accidental hypothermia/et
- 9 hypo?therm\$.ti,ab.
- 10 normo?therm\$.ti,ab.
- 11 thermo?regulat\$.ti,ab.
- 12 or/7-11
- 13 6 and 12
- 14 exp hypothermia/
- 15 accidental hypothermia/
- 16 or/1-5
- 17 (14 or 15) and 16
- 18 13 or 17
- 19 exp anesthesia/
- 20 exp anesthesia complication/
- 21 exp surgery/
- 22 su.fs.
- 23 or/19-22
- 24 18 and 23

Cinahl

- 1 (risk\$ adj2 (factor\$ or assessment\$)).mp.
- 2 (logistic\$ adj model\$).mp.
- 3 exp risk factors/
- 4 et.fs.
- 5 rf.fs.
- 6 or/1-5
- 7 exp hypothermia/et, rf
- 8 hypo?therm\$.ti,ab.
- 9 normo?therm\$.ti,ab.
- 10 thermo?regulat\$.ti,ab.
- 11 or/7-10
- 12 or/1-3
- 13 11 and 12
- 14 exp hypothermia/
- 15 6 and 14
- 16 13 or 15

The Cochrane Library

- #1 (hypo*therm* or normo*therm* or thermo*regulat* or thermo*genesis):ti,ab,kw
- #2 risk* near/2 (factor* or assessment*):ti,ab,kw
- #3 (logistic* next model*):ti,ab,kw
- #4 (risk next factor*):ti,kw,ab
- #5 (causality or aetiology or etiology):ti,ab,kw
- #6 (#2 OR #3 OR #4 OR #5)
- #7 (#1 AND #6)

Health Economics Filter

For this review the broad IPH searches above were combined with the following filters for health economics studies. They were also combined with the exclusions filter described above.

Medline

- 1 exp "costs and cost analysis"/
- 2 economics/
- 3 exp economics, hospital/
- 4 exp economics, medical/
- 5 exp economics, nursing/
- 6 exp economics, pharmaceutical/
- 7 exp "fees and charges"/
- 8 exp budgets/
- 9 ec.fs.
- 10 (economic\$ or pharmaco-economic\$ or cost\$ or price\$ or pricing\$ or budget\$).ti,ab.
- 11 (value adj2 (money or monetary)).ti,ab.
- 12 (expenditure not energy).ti,ab.
- 13 or/1-13
- 14 ((metabolic or energy or oxygen) adj1 cost\$).ti,ab.
- 15 14 not 13
- 16 exp quality-adjusted life years/
- 17 exp "quality of life"/
- 18 (qaly\$ or qald\$ or qale\$ or qtime\$).tw.
- 19 daly\$.tw.
- 20 adjusted life\$.tw.
- 21 or/16-20
- 22 15 or 21

Embase

- 1 health economics/
- 2 exp economic evaluation/
- 3 exp health care cost/
- 4 exp pharmaco-economics/
- 5 exp fee/
- 6 budget/
- 7 (economic\$ or pharmaco-economic\$ or cost\$ or price\$ or pricing\$ or budget\$).ti,ab.
- 8 (value adj2 (money or monetary\$)).ti,ab.
- 9 (expenditure not energy).ti,ab.
- 10 or/1-9
- 11 ((metabolic or energy or oxygen) adj1 cost\$).ti,ab.
- 12 10 not 11
- 13 quality adjusted life year/
- 14 quality of life/
- 15 (qaly\$ or qald\$ or qale\$ or qtime\$).tw.
- 16 daly\$.tw.
- 17 adjusted life\$.tw.
- 18 or/13-17
- 19 12 or 18

Cinahl

- 1 exp economics/
- 2 exp financial management/
- 3 exp financial support/
- 4 exp financing organized/
- 5 exp business/
- 6 or/2-5
- 7 1 not 6
- 8 health resource allocation/
- 9 health resource utilization/
- 10 8 or 9
- 11 7 or 10
- 12 budgets/
- 13 ec.fs.
- 14 (economic\$ or pharmaco-economic\$ or cost\$ or price\$ or pricing\$ or budget\$).ti,ab.
- 15 (value adj2 (money or monetary)).ti,ab.
- 16 (expenditure not energy).ti,ab.
- 17 or/11-16
- 18 ((metabolic or energy or oxygen) adj1 cost\$).ti,ab.
- 19 17 not 18
- 20 exp "quality of life"/
- 21 (qaly\$ or qald\$ or qale\$ or qtime\$ or daly\$).tw.
- 22 adjusted life\$.tw.
- 23 or/20-22
- 24 19 or 23

NHS Economic Evaluations Database (NHS EED)

The broad IPH search on The Cochrane Library was repeated to get references specifically from NHS EED.

Detection and Monitoring

The following searches were combined with the exclusions filter described above. They were limited by age group to include all adults.

Medline

- 1 exp tympanic membrane/
- 2 exp esophagus/
- 3 exp pulmonary artery/
- 4 exp temporal arteries/
- 5 exp nasopharynx/
- 6 exp mouth mucosa/
- 7 exp rectum/
- 8 exp axilla/
- 9 exp urinary bladder/
- 10 or/1-9
- 11 body temperature/
- 12 exp thermometers/
- 13 or/11-12
- 14 10 and 13
- 15 monitoring, physiologic/
- 16 monitoring, intraoperative/
- 17 or/15-16
- 18 13 and 17
- 19 ((core or body) adj temperature\$ adj3 (monitor\$ or measur\$)).ti,ab.
- 20 hypothermia/di
- 21 exp postoperative complications/di
- 22 exp intraoperative complications/di
- 23 or/20-22
- 24 13 and 23
- 25 14 or 18 or 19 or 24
- 26 exp surgical procedures, operative/
- 27 su.fs.
- 28 exp anesthesia/
- 29 or/26-28
- 30 25 and 29

Embase

- 1 eardrum/
- 2 esophagus/
- 3 pulmonary artery/
- 4 temporal artery/
- 5 nasopharynx/
- 6 mouth mucosa/
- 7 rectum/
- 8 axilla/
- 9 bladder/
- 10 or/1-9
- 11 core temperature/
- 12 exp body temperature/
- 13 exp thermometer/
- 14 or/11-13
- 15 10 and 14

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- 16 monitoring/
- 17 exp patient monitoring/
- 18 exp temperature measurement/
- 19 or/16-18
- 20 14 and 19
- 21 ((core or body) adj temperature\$ adj3 (monitor\$ or measur\$)).ti,ab.
- 22 hypothermia/di
- 23 accidental hypothermia/di
- 24 exp postoperative complication/di
- 25 peroperative complication/di
- 26 or/22-25
- 27 14 and 26
- 28 15 or 20 or 21 or 27
- 29 exp anesthesia/
- 30 exp anesthesia complication/
- 31 exp surgery/
- 32 su.fs.
- 33 or/29-32
- 34 28 and 33

Cinahl

- 1 tympanic membrane/
- 2 esophagus/
- 3 pulmonary artery/
- 4 temporal arteries/
- 5 nasopharynx.mp.
- 6 mouth mucosa/
- 7 rectum/
- 8 axilla/
- 9 bladder/
- 10 or/1-9
- 11 exp body temperature/
- 12 exp thermometers/
- 13 or/11-12
- 14 10 and 13
- 15 monitoring, physiologic/
- 16 intraoperative monitoring/
- 17 body temperature determination/
- 18 or/15-17
- 19 13 and 18
- 20 ((core or body) adj temperature\$ adj3 (monitor\$ or measur\$)).ti,ab.
- 21 hypothermia/di
- 22 exp postoperative complications/di
- 23 exp intraoperative complications/di
- 24 or/21-23
- 25 13 and 24
- 26 14 or 19 or 20 or 25
- 27 exp surgery, operative/
- 28 su.fs.
- 29 exp anesthesia/
- 30 or/27-29
- 31 26 and 30

The Cochrane Library

- #1 ((tympanic NEXT membrane*) or eardrum* or oesophag* or esophag* or (pulmonary NEXT artery) or (temporal NEXT arter*) or nasopharyn* or (mouth NEXT mucosa) or oral or rectum or rectal or axilla* or bladder):kw,ab,ti
- #2 (thermometer*):ti,kw,ab
- #3 ((body NEXT temperature*) or (core NEXT temperature*)):ti,kw,ab
- #4 (monitor* or measure* or determin*):kw,ab,ti
- #5 (#1 AND (#2 OR #3))
- #6 (#3 AND #4)
- #7 (sensitiv* or diagnos*):kw,ab,ti
- #8 (hypotherm* or normotherm*):kw,ab,ti
- #9 (#7 AND #8)
- #10 (#5 OR #6 OR #9)
- #11 (surg* or operat* or anesthe* or anaesthe*):ti,kw,ab
- #12 (#10 AND #11)
- #13 (newborn* or neonat* or child*):ti,ab,kw
- #14 (#12 AND NOT #13)

Adverse Effects of Warming Devices

The following “quick and dirty” search was used to retrieve supplementary papers on the adverse effects of warming devices.

Medline

- 1 (warm\$ adj3 device\$).mp.
- 2 ae.fs.
- 3 1 and 2
- 4 *heating/ae
- 5 *rewarming/ae
- 6 or/3-5

Embase

- 1 (warm\$ adj3 device\$).mp.
- 2 ae.fs.
- 3 co.fs.
- 4 1 and (2 or 3)

Pharmacological Prevention and Treatment of IPH / Shivering

The following search strategies were combined with the exclusions filter described above. They were limited by RCT and SR study design filters.

Medline

- 1 shivering/
- 2 tremor/
- 3 (shiver\$ or shake\$ or shaking or tremor\$).ti,ab.
- 4 or/1-3
- 5 exp anesthesia/
- 6 (anaesthe\$ or anesthe\$).ti,ab.
- 7 or/5-6
- 8 exp surgical procedures, operative/
- 9 su.fs.
- 10 (surger\$ or surgical).ti,ab.
- 11 or/8-10
- 12 7 or 11
- 13 4 and 12

Embase

- 1 shivering/
- 2 exp tremor/
- 3 (shiver\$ or shake\$ or shaking or tremor\$).ti,ab.
- 4 or/1-3
- 5 exp anesthesia/
- 6 exp anesthesia complication/
- 7 (anaesthe\$ or anesthe\$).ti,ab.
- 8 exp surgery/
- 9 su.fs.
- 10 (surger\$ or surgical).ti,ab.
- 11 or/5-10
- 12 4 and 11

Cinahl

- 1 shivering/
- 2 tremor/
- 3 (shiver\$ or shake\$ or shaking or tremor\$).ti,ab.
- 4 or/1-3
- 5 exp anesthesia/
- 6 (anaesthe\$ or anesthe\$).ti,ab.
- 7 exp surgery, operative/
- 8 su.fs.
- 9 (surger\$ or surgical).ti,ab.
- 10 or/5-9
- 11 4 and 10

The Cochrane Library

- #1 (shiver* or shake* or shaking or tremor*):ti,ab,kw
- #2 (anaesthe* or aneste*):ti,kw,ab
- #3 (surger* or surgical):ti,ab,kw
- #4 (#2 OR #3)
- #5 (#1 AND #4)

APPENDIX C: CHARACTERISTICS OF INCLUDED STUDIES

C1: RISK FACTORS PHARMACOLOGICAL AGENTS

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Alfonsi 1998 Trial held in France RCT	Inclusion and exclusion criteria: 18-40 years; lower limb orthopaedic surgery that lasted at least 1 hr. Exclusions: obese, febrile, beta-blockers, alpha2 receptor antagonists, maois, chlorpromazine, tricyclic antidepressants, th yearoid/neuromuscular disease, dysautonomia, raynaud's syndrome age (range): mean 28 years (18-40 years); gender (m/f): 20: 10; comorbidities: not stated; No active warming; passive insulation restricted to 1 layer surgical draping; IV fluids not warmed; postoperatively covered by single blanket; postoperative ambient temperature 20.8°C	1) Meperidine (pethidine) (opioid); duration: 30 min before surgery to several hrafter; infusion with target conc. 0.15-0.6microgram/ml; n=15 2) Sufentanil (opioid); duration: not stated; infusion with target conc. 0.1-0.2nanogram/ml; n=15
Bilotta 2002 Trial held in Italy RCT	Inclusion and exclusion criteria: lower limb orthopaedic surgery Age (range): mean 46 years; gender (m/f): 44: 46; comorbidities: not stated; Theatre temperature 22°C (SD 1)	1) Nefopam (centrally activg analgesic); duration: immediately before anaesthesia; 0.15mg/kg; n=30 2) saline (placebo); duration: not stated; n=30 3) Tramadol 0.5mg/kg; n=30
Buggy Trial held in Ireland RCT	Inclusion and exclusion criteria: elective orthopaedic surgery on the limbs Age (range): not stated; gender (m/f): not stated; comorbidities: not stated; Cotton covering; nasopharyngeal temperature measured; abstract only	1) Clonidine (alpha adrenergic agonist); duration: at induction of anaesthesia; 150 µg n=not stated 2) Saline (placebo); duration: at induction of anaesthesia; n=not stated

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Cheong 1998 Trial held in Singapore RCT</p>	<p>Inclusion and exclusion criteria: ent, dental, gynae, orthopaedic or general minor surgery. Excluded: fever, hypertension, ihd, blood transfusion within 24 hours Age (range): mean around 35 years; gender (m/f): 58: 102; comorbidities: not stated; Theatre temperature 22°C; no warming blanket; no blood products given; covered with standard gown and drapes</p>	<ol style="list-style-type: none"> 1) Thiopentone (barbiturate); duration: at induction; 4mg/kg; n=80 2) Propofol (anaesthetic); duration: at induction; 2.5mg/kg; n=80
<p>Crozier 2004 Trial held in Germany, Sweden, Norway RCT</p>	<p>Inclusion and exclusion criteria: excl: alcohol abuse, renal, hepatic or emotional disorders, chronic medication with opioids, benzodiazepines or similar substances. Age (range): mean 42 years; gender (m/f): 58: 40; comorbidities: not stated; Active warming with Bair Hugger to prevent intra-operation heat loss; opioid infusion rate could be varied according to clinical need</p>	<ol style="list-style-type: none"> 1) Remifentanil (opioid); duration: not stated; 1 microg/kg loading dose, then 0.1microg/ kg/min; n=49 2) Alfentanil (opioid); duration: not stated; 30microg/kg loading dose then 0.16microg/ kg/min; n=49
<p>De witte 1995 Trial held in Belgium RCT</p>	<p>Inclusion and exclusion criteria: gynaecological laparoscopic surgery of around 1 hr duration. Exclusion: obese, febrile, taking vasoactive, antidepressant or analgesic drugs; history of CV, respiratory, endocrine or neurological disease Age (range): mean around 35 years; gender (m/f): all female; comorbidities: not stated; Abstract only</p>	<ol style="list-style-type: none"> 3) Tramadol and glycopyrronium (centrally acting analgesic); duration: premedication 1 hr before surgery; 1.5mg/kg tramadol and glycopyrronium 5microg/kg; n=10 4) Glycopyrronium (anticholinergic); duration: premedication 1 hr before surgery; 5microg/kg; n=11 5) Saline; n=11

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
De witte 1998 Trial held in Belgium RCT	Inclusion and exclusion criteria: laparoscopic surgery. Exclusion: obese, febrile, taking vasoactive, antidepressant or analgesic drugs; history of CV, respiratory, endocrine or neurological disease, pregnant. Age (range): 47 years (SD 13) (18-65 years); gender (m/f): 30: 10; comorbidities: not stated; No active warming; theatre temperature 21.8°C	6) Tramadol (centrally acting analgesic); duration: at beginning of wound closure; 3mg/kg; n=20 7) Saline (placebo); duration: not stated; n=20
Delauney 1991 Trial held in France RCT	Inclusion and exclusion criteria: thyroid surgery; hyper or hypothyroid patients excluded; also excluded if beta-blockers, psychotropic drugs, alpha-2 adrenergic agonists. Age (range): mean 37 years (range 20-52 years); gender (m/f): 2: 18; comorbidities: not stated;	3) Clonidine (alpha 2 antagonist); duration: over 20 minutes at end of surgery; 2 microgram/kg; n=10 4) Isotonic saline solution (placebo); duration: over 20 minutes at end of surgery; n=10
Goto 1999 Trial held in Japan RCT	Inclusion and exclusion criteria: excl; history of thyroid disease; dysautonomia; Raynaud's syndrome; malignant hyperthermia; cerebrovascular or other CNS disease Age (range): 32-65 years, mean around 56 years; gender (m/f): 27: 11; comorbidities: not stated; Patients covered with 1 layer surgical draping; ambient temperature near 22-23°C	5) Xenon and isoflurane (general anaesthetic); duration: anaesthesia; n=15 6) Isoflurane only (general anaesthetic); duration: anaesthesia; n=15 7) Nitrous oxide and isoflurane; n=15

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Study	Participants	Interventions
Grover 2002 Trial held in India RCT	Inclusion and exclusion criteria: brachytherapy for cervical cancer Age (range): mean 42 years; gender (m/f): all female; comorbidities: not stated;	1) Midazolam (benzodiazepine); duration: at end of pr°C edure; 0.04mg/kg; n=20 2) Saline (placebo); duration: at end of pr°C edure; n=20
Holdcroft 1978 Trial held in UK RCT	Inclusion and exclusion criteria: microscopic surgery of the fallopian tubes Age (range): mean around 29 years; gender (m/f): all women; comorbidities: not stated; Theatre temperature 24°C; no warming blanket	1) Halothane 0.5% (anaesthetic); duration: at induction of anaesthesia; not stated; n=8 2) Fentanyl (opioid); duration: at induction of anaesthesia; 0.8-1.5mg; n=8 3) Halothane 1%; n=7
Hong 2005 Trial held in South Korea RCT	Inclusion and exclusion criteria: casearean delivery under combined spinal-epidural anaesthesia. Excluded if contra-indications to regional anaesthesia, allergy to study medication, severe obesity, pre-eclampsia, placenta paevia, diabetes Age (range): mean around 30 years; gender (m/f): all female; comorbidities: not stated; Theatre 23-25°C	1) Morphine and 0.5% bupivacaine (opioid); duration: unclear; 0.1mg morphine and 8-10mg bupivacaine; n=29 2) 0.5% bupivacaine alone (usual treatment); duration: unclear; 8-10mg bupivacaine; n=30 3) 0.2mg morphine and bupivacaine; n=30; 4) 10mg pethidine and bupivacaine; n=30
Horn 1997 Trial held in Germany RCT	Inclusion and exclusion criteria: excluded: vasoconstrictive drugs required during surgery Age (range): mean around 41 years; gender (m/f): 32: 28; comorbidities: not stated; Patients covered with warmed sheets	1) Clonidine and isoflurane (alpha 2 antagonist); duration: 5 mins before extubation; 3 microgram/kg; n=15 2) Saline and isoflurane (placebo); duration: 5 mins before extubation; n=15

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Horn 1998 Trial held in Germany RCT	Inclusion and exclusion criteria: excl: vasoconstrictors required for surgery; long term alpha-2 agonist treatment; parkinson's disease-type sympatientsoms or signs Age (range): mean around 41 years; gender (m/f): 35: 25; comorbidities: not stated; Covered with warmed sheets during anaesthesia; ambient temperature 23°C .	<ol style="list-style-type: none"> 1) Physostigmine (cholinesterase inhibitor); duration: at end of surgery; 0.04mg/kg; n=15 2) Saline control (placebo); duration: at end of surgery; n=15 3) Meperidine 0.5mg/kg; n=15 4) clonidine 1.5microgram/kg; n=15
Ikeda 2001 Trial held in Japan RCT	Inclusion and exclusion criteria: elective oral and superficial surgery; excl: obese, taking medication, history of thyroid disease, dysautonomia, Raynaud's syndrome, diabetes mellitus, hypertension Age (range): mean around 35 years; gender (m/f): 11: 9; comorbidities: not stated; IV fluids warmed to 37°C; ambient temperature 25-26°C; patients covered with single cotton blanket and surgical drapes during surgery	<ol style="list-style-type: none"> 1) Ketamine (general anaesthetic); duration: anaesthetic; 1.5mg/kg; n=10 2) Propofol (general anaesthetic); duration: anaesthetic; 2.5mg/kg; n=10
Kelsaka 2006 Trial held in Turkey RCT	Inclusion and exclusion criteria: 20-60 years; elective orthopaedic surgery with leg tourniquet under spinal anaesthesia. Exclusion: obese, fever, hypo-/hyperthyroid, Parkinson's disease, dysautonomia, Raynaud's syndrome, blood transfusion, vasodilators, drugs like age (range): mean around 36 years; gender (m/f): 56:19; comorbidities: not stated; Lactated Ringer's solution warmed to 37°C infused 10ml/kg/hr for 30 min before surgery; ambient temperature 21-22°C; patients covered with 1 layer surgical drape during operation and 1 cotton blanket postoperative	<ol style="list-style-type: none"> 1) Ondansteron (serotonin receptors or antagonist); duration: immediately before spinal anaesthesia; 8mg IV; n=25 2) Saline 0.9% (placebo); duration: not stated; n=25 3) Meperidine 0.4mg/kg IV; n=25

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<p>Kimberger 2007 Trial held in Austria RCT</p>	<p>Inclusion and exclusion criteria: german-speaking patients aged 18-75 years; excluded if psychiatric history; chronic sedative drugs, alcohol addiction, drug abuse, prior neurosurgery Age (range): mean age around 49 years; gender (m/f): 44: 36; comorbidities: not stated; Pre-operation thermal comfort/anxiety/temperature measured; no info on anaesthetic or operation itself. Ambient temperature at start and end around 19.25°C. Core temperature start 36.55°C.</p>	<ol style="list-style-type: none"> 1) Midazolam and passive insulation (benzodiazepine); duration: 34 (3.0)min; 30microgram/kg and passive insulation; n=20 2) Passive insulation alone (single blanket) and placebo (ringer's lactate) (passive warming device); duration: 34.5 (3.5)min; n=20 3) Warm air and placebo; n=20 4) warm air and midazolam; n=20
<p>Kinoshita 2004 Trial held in Japan RCT</p>	<p>Inclusion and exclusion criteria: excl: morbid obesity, febrile tendency, cardiopulmonary disease, endocrine disease; pre-menopausal if female. Age (range): 20-72 mean 54 years; gender (m/f): 14: 6; comorbidities: not stated;; ambient temperature 25°C; no active warming</p>	<ol style="list-style-type: none"> 1) Ketamine and propofol (general anaesthetic); duration: anaesthesia; ketamine 0.3mg/kg/hr; n=10 2) Placebo and propofol (placebo); duration: anaesthesia; n=10
<p>Mao 1998 Trial held in Taiwan RCT</p>	<p>Inclusion and exclusion criteria: aged above 40 years; elective urological surgery under spinal anaesthesia. Exclusion: bradycardia, hypotension, av conduction block, left bundle branch block, sepsis, chronic clonidine exposure, allergy Age (range): mean around 69 years; gender (m/f): all male; comorbidities: not stated; Ambient temperature 22-23°C</p>	<ol style="list-style-type: none"> 1) Clonidine (alpha adrenergic agonist); duration: 90 min before spinal anaesthesia; 150microgram (oral); n=48 2) Starch placebo (oral) (placebo); duration: 90 min before spinal anaesthesia; 2 tablets; n=52

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<p>Mathews 2002 Trial held in Kuwait RCT</p>	<p>Inclusion and exclusion criteria: elective general surgical or laparoscopic procedures with expected duration >1 hour. Excl if required blood or blood products or urological endoscopic procedure; BMI>30 kg/m²; history of convulsions or multiple allergies; vasoact age (range): mean around 38 years; gender (m/f): 84: 66; comorbidities: not stated; IV fluid not warmed; temperature probe in nasopharynx; ambient temperature 21.2-24.9°C</p>	<ol style="list-style-type: none"> 1) Tramadol (centrally acting analgesic); duration: at wound closure; 2mg/kg; n=50 2) Saline (placebo); duration: at wound closure; n=50 3) Rramadol 1mg/kg; n=50
<p>Matsukawa 2001 Trial held in Japan RCT</p>	<p>Inclusion and exclusion criteria: aged over 60 years; scheduled for surgery lasting at least 3 hours. Excluded if obese, coronary artery disease, on medication, thyroid disease, dysautonomia, Raynaud's syndrome Age (range): mean 73 years (SD 8 years); gender (m/f): 14: 26; comorbidities: not stated; Patients minimally clothed and covered with single layer cotton blanket; ambient temperature 23-24°C; outcome temperature before start of operation</p>	<ol style="list-style-type: none"> 1) Midazolam (benzodiazepine); duration: 30 minutes before anaesthesia; 0.05mg/kg; n=10 2) Saline control (placebo); duration: not stated; n=10 3) Atropine 0.01mg/kg; n=10 4) Atropine 0.01mg/kg plus midazolam 0.05mg/kg; n=10
<p>Mizobe 2005 Trial held in Japan RCT</p>	<p>Inclusion and exclusion criteria: excl: obese, febrile, vasodilators, medication altering thermoregulation, history of thyroid disease or autonomic dysfunction Age (range): 20-60 years; gender (m/f): 9: 13; comorbidities: not stated; Patients covered with one cotton sheet; ambient temperature 24°C</p>	<ol style="list-style-type: none"> 1) Clonidine (alpha adrenergic agonist); duration: not stated; 150microg; n=8 2) Placebo (placebo); duration: not stated; n=8 3) Clonidine 300 micrograms

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<p>Piper 2002 Trial held in Germany RCT</p>	<p>Inclusion and exclusion criteria: abdominal or urological surgery. Exclusion: myocardial insufficiency, arrhythmias, muscle disease, parkinson's disease, fever, vasoconstrictors peri-operatively, long-term alpha-2 agonist Age (range): mean around 53 years; gender (m/f): 45: 45; comorbidities: not stated; Not actively warmed</p>	<ol style="list-style-type: none"> 1) Dolasetron (serotonin receptor antagonist); duration: after induction of anaesthesia; 12.5mg; n=30 2) Saline (placebo); duration: after induction of anaesthesia; n=30 3) Clonidine 3µg/kg; n=30
<p>Piper 2004 Trial held in Germany/Switzerland RCT</p>	<p>Inclusion and exclusion criteria: elective abdominal or orthopaedic surgery; excluded if needed vasoconstrictors ; cardiac arrhythmias/heart failure; allergy to study drug; fever; muscle disease; Parkinson's disease; alcohol abuse Age (range): mean around 55 years; gender (m/f): 191: 180; comorbidities: not stated; Patients not actively warmed; drug administered IV At end of surgery.</p>	<ol style="list-style-type: none"> 1) Nefopam (centrally acting analgesic); duration: at end surgery; 0.2mg/kg; n=73 2) Placebo (saline 0.9%) (placebo); duration: not stated; n=74 3) Nefopam 0.1mg/kg; n=75 4) Nefopam 0.05mg/kg; n=75 5) Clonidine 1.5microgram/kg; n=73
<p>Powell 2000 Trial held in UK RCT</p>	<p>Inclusion and exclusion criteria: minor orthopaedic, general or urological surgery. Exclusion: fever, allergy to ondansetron, surgery anticipated to be >90min or require ventilation; use of vasoconstrictors or vasodilators Age (range): mean 46 years (18-60 years); gender (m/f): 61: 21; comorbidities: not stated;</p>	<ol style="list-style-type: none"> 1) Ondansetron (serotonin receptor antagonist); duration: at induction; 4mg; n=27 2) Saline (placebo); duration: not stated; 4ml; n=28 3) Ondansetron 8mg; n=27

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<p>Rohm 2005 Trial held in Germany RCT</p>	<p>Inclusion and exclusion criteria: abdominal or urological surgery. Exclusion: alpha2agonist treatment; cardiac arrhythmias; myocardial insufficiency; vasoconstrictors; muscle disease, parkinson's disease; other neurological or psychiatric disorder; fever Age (range): mean around 60 years; gender (m/f): 63: 26; comorbidities: not stated; Covered with sheets during anaesthesia</p>	<ol style="list-style-type: none"> 1) Physostigmine (cholinesterase inhibitor); duration: over 15 minutes at start of skin closure; 2mg; n=31 2) Saline (placebo); duration: over 15 minutes at start of skin closure; n=28 3) Nefopam 10mg; n=30
<p>Sagir 2007 Trial held in Turkey RCT</p>	<p>Inclusion and exclusion criteria: excl: hyperthyroidism, cardiopulmonary disease, psychological disorder, temperature >38°C or <36.5°C Age (range): mean around 43 years (18-65 years); gender (m/f): 112: 48; comorbidities: not stated; Theatre temperature 24°C; irrigation and IV fluids pre-heated to 37°C; covered with 1 layer cotton blanket.</p>	<ol style="list-style-type: none"> 1) Ketamine (nmda receptor antagonist); duration: just after induction of anaesthesia; 0.5mg; n=40 2) Saline (placebo); duration: just after induction of anaesthesia; n=40 3) Granisetron 3mg; n=40; ketamine 0.25mg and granisetron 1.5mg; n=40
<p>Stapelfeldt 2005 Trial held in USA RCT</p>	<p>Inclusion and exclusion criteria: supratentorial procedures. Exclusion: raised intracranial pressure, emergency surgery, on clonidine Age (range): mean 49 years; gender (m/f): 14: 20; comorbidities: not stated;</p>	<ol style="list-style-type: none"> 1) Clonidine (alpha 2 antagonist); duration: at beginning of dural closure; 3µg/kg; n=17 2) Saline (placebo); duration: at beginning of dural closure; n=17

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<p>Toyota 2004 Trial held in Japan RCT</p>	<p>Inclusion and exclusion criteria: arthroscopic knee ligament reconstruction lasting >2 hours. Exclusion: obese, thyroid disease, dysautonomia, Raynaud's syndrome, vasodilators. Age (range): range 13-52 years; gender (m/f): 19: 26; comorbidities: not stated; Room temperature 24-25°C; covered with single surgical drape</p>	<p>1) Midazolam as premedication (benzodiazepine); duration: 30 min prior to anaesthesia; 0.04mg/kg im; n=15 2) No premedication usual care; duration: not stated; n=15 3) Midazolam 0.08mg/kg; n=15</p>
<p>Weinbroum 2001 Trial held in Israel RCT</p>	<p>Inclusion and exclusion criteria: inguinal hernioplasty, breast biopsy or diagnostic arthroscopy. Exclusion: benzodiazepine within last 2 weeks; chronic benzodiazepine use; significant cardiovascular/respiratory disease; pregnancy; age<18 years; previous administrat age (range): mean around 51 years; gender (m/f): 71: 31; comorbidities: not stated;</p>	<p>1) Flumenazil (benzodiazepine antagonist); duration: when patient began to awaken; 1mg; n=46 2) Saline (placebo); duration: when patient began to awaken; n=50 3) a) With halothane 0.75%; b) with enflurane 1.7%; c) with isoflurane 1.2%</p>

C2: RISK FACTORS NON-PHARMACOLOGICAL

<i>Study details</i>	<i>Patient details</i>	<i>Factors adjusted for</i>	<i>Anaesthesia/surgery</i>	<i>Further details</i>
Abelha 2005; prospective cohort study; country portugal; total number of patients: 185	Age: 66.0 y (sd 12.6), range 25 to 94; ASA grade ASA I 3%, ASA ii 39%, ASA III 49%, ASA IV 10%; temperature measured at tympanic membrane; some had warming mechanisms	Magnitude of surgery, IV crystalloids, preop patient temp, saps ii + adjusted for: anaesthesia type, anaesthesia duration, temperature monitoring, FAW, packed erythrocytes. Univariate: age, gender, body weight, BMI, ASA , emergency, IV colloids, plasma	Type of anaesthesia: mixed general/regional/combined; type of surgery: non-cardiac; theatre temperature 20-22°C(not adjusted for)	Multivariate analysis only contained those with p<0.1 in univariate analysis. 29/185 patients died. Preop ward temperature 36.37 (sd 0.49); range 35.00 to 38.60°C. 22/185 (12%) had temperature monitoring; 81/185 (44%) had FAW.
Baker 1995; prospective cohort study; country Canada; total number of patients: 56	Age: 59.9 (sd 11.9); ASA grade: not stated; temperature measured at pulmonary artery; no FAW, but warmed blankets and blood warmed	Age, gender, weight, height, history of previous cardiac surgery, pre-bypass temperature, time on cpb, fluid balance on cpb, type of surgery, nitroglycerin in theatre, airway humidifier, alpha agonists, volume warmed IV fluids, volume of unwarmed fluids	Type of anaesthesia: general; type of surgery: cardiac normothermia cpb; theatre temperature not stated	Patients having elective/urgent cardiac surgery under normothermic bypass. No FAW, but warmed blankets used at nurse's discretion; blood kept at 37°C, but IV fluids not warmed. Premed morphine/perphenazine. 15 had IPH.
Closs 1986; prospective cohort study; country UK; total number of patients: 31	Age: 53.6 y (cholecystectomy) and 72 y (fnf); ASA grade: not stated; temperature measured at aural; no warming mechanisms stated	Multivariate analysis only recorded r and r ² not coefficients or p-values. Adjusted for age, theatre temperature, time spent in recovery, triceps skinfold thickness or body density	Type of anaesthesia: not stated; type of surgery: abdominal and orthopaedic; theatre temperature not stated (even though in regression analysis)	Temperature not measured during surgery or in immediate postoperative period because of problems of access. Cholecystectomy; n=17) and fractured femur; n=14)

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Danelli 2002; RCT study; country Italy; total number of patients: 44	Age: mean 64 and 62 y (sd 8); range 18 minm to 75 max); ASA gradel-II; temperature measured at bladder; no warming devices but fluids warmed	RCT, comparable at baseline for age, gender, weight, height, blood loss, crystalloid infusion. Duration of surgery was significantly longer in the laparoscopic group (mean difference 1.1 h)	Type of anaesthesia: combined general/regional; type of surgery: abdominal; theatre temperature 21-23°C, laminar flow, rel humidity 40-45%	Colorectal resection, duration 255 and 180 min (medians). Obese patients excluded. Premed with midazolam. Ga induction thiopental/fentanyl/atracurium; maintained isoflurane. Epidural block up to t4 with ropivacaine. Infused solns warmed to 37°C.
El-gamal 2000; prospective cohort study; country Egypt; total number of patients: 40	Age: 2 groups: 33 y (sem 2); 20-40 & 67 (sem 2); 60-75y; ASA gradel-II; temperature measured at tympanic membrane; no warming mechanisms stated	2 selected cohorts, 20 aged 20-40y, 20 aged 60-75. Following held constant: ASA I-II , type of surgery (lower extremity orthopaedic), type of anaesthetic (GA). Comparable at baseline for bmi, duration of surgery, IV fluid volume; preop core temperature	Type of anaesthesia: general; type of surgery: orthopaedic; theatre temperature 25.6 or 25.9°C(SEM 0.3); range 24.2 to 28.5	Exclusions cardiac/pulmonary disease, thyroid disorders, raynaud's disease, dysautonomia, preoperative fever. Duration of surgery 1.7-1.8 h (sem 0.08). IV crystalloids given at room temperature
Flores-maldonado 1997; prospective cohort study; country México; total number of patients: 130	Age: 5 to 90 y (mean 42 sd20); ASA gradel: 50%; ASA II:40%; ASA III/IV 10%; temperature measured at tympanic membrane; no warming mechanisms stated	Age, gender, theatre temperature, duration of surgery, magnitude of surgery, blood transfusion, type of anaesthesia x3	Type of anaesthesia: mixed general/regional groups; type of surgery: mixed; theatre temperature mean 22.9 (sd 1.2)°C	Patients with fever, head or neck surgery and ear or upper respiratory tract infection not admitted into follow up. Emergency (35%) and elective. 53 patients had IPH. 19% had 'miscellaneous' anaesthesia. Initial temp not stated.

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Frank 1992; RCT study; country USA; total number of patients: 97	Age: 35 to 94y; mean 64.5, sd 1.1; ASA grade: not stated or considered; temperature measured at sublingual reliable; no wd but fluids warmed	Anova/multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of IV crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii)	Type of anaesthesia: RCT general/epidural; type of surgery: vascular; theatre temperature mean 20.9 °C (SD 0.13); range 18.7 to 22.9°C	Assignment to theatres based on scheduling rules/availability. Different analgesia for general (morphine pca) and epidural (fentanyl) anaesthesia. All had im midazolam premed. Lower extremity vascular bypass grafting. Preop temp not stated. Although this was an RCT for type of anaesthesia, we assessed it as a cohort study because the other variables were assigned in non-random way.
Frank 1994; RCT study; country USA; total number of patients: 30	Age: median 62 y (48-70); ASA grade: II; temperature measured at tympanic membrane; no warming devices but fluids warmed	Stratified RCT (on surgeon); also analysed as subgroups by age. Baseline comparable for age, body weight, duration surgery, theatre temp, PACU temperature, blood transfusion. Not comparable: crystalloid admin (significantly higher in GA)	Type of anaesthesia: randomised to epidural/general; type of surgery: urology; theatre temperature 21.7 (sem 0.4) ea and 22.0 (sem 0.4) ga	Radical prostatectomy for prostate cancer, all had midazolam on arrival in or. Pre-induction IV ringers at room temp, then fluids warmed to 37°C. Gases warmed to 38°C & humidified. No warming devices. All patients had epidural catheter. PACU temp 23.3°C. (sem 0.3) EA; 23.0°C (sem 0.3) GA. No patient had Raynauds disease, preop fever, thyroid disorder.

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Frank 2000; prospective cohort study; country USA; total number of patients: 44	Age: 57years (SD 7) range 47-67; ASA grade not stated or considered; temperature measured at tympanic membrane; no warming devices but fluids warmed	Age, duration of surgery, theatre temperature, body mass, %body fat, height of spinal block (+ univariate bmi)	Type of anaesthesia: spinal; type of surgery: urology; theatre temperature mean 20.9°C(sd 0.13) range 18.7 to 22.9.	All patients male undergoing radical prostatectomy under spinal anaesthesia (midazolam + 18-20mg bupivacaine/20 mcg fentanyl). Regression with backward elimination. Preop temperature 37°C.
Hendolin 1982; RCT study; country Finland; total number of patients: 38	Age: GA 66.6y (SD6.6); EA 70.9 (SD8.9); ASA grade mean 2.3 or 2.6 (SD 0.6); temperature measured at aural and nasopharyngeal; wd not stated but blood warmed	RCT. Baseline comparability age, weight, height, bmi, ASA . Factors kept constant: type of surgery, duration of surgery	Type of anaesthesia: randomised to epidural/general; type of surgery: urology; theatre temperature 24°C; rel humidity 40-55%	Retropubic prostatectomy, all had diazepam premedication 45 min preop. GA: induction thiopentone; 70% N ₂ O/O ₂ + pethidine. Ventilator 10 ml/kg. EA at 3 rd lumbar vertebra (up to t5); butanilcaine. Blood warmed. Half had polygeline. Sig diff in periop blood loss. Preoperative temperature 36.2°C (SEM 0.1). Note that nasopharyngeal temperature measurement is not thought to be very accurate.

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Hind 1994a; prospective cohort study; country UK; total number of patients: 30	Age: 51.43 y (SD 12.01); range 37 to 76; ASA gradenot stated; temperature measured at oesophageal; no warming mechanisms stated	1 st of 2 multivariate analyses that fitted the data. Factors included: age, theatre temperature, body fat index, IV fluids, total blood loss (from univariate correlations). Excluded: surgery duration, theatre humidity. Constant: type of anaesthesia.	Type of anaesthesia: general; type of surgery: abdominal; theatre temperature 21.3°C(SD 1.2); 19.6-23.3. Rh: 56% (4); 50- 65	All patients female and surgery was in afternoon. Elective gynaecological surgery. GA: induction: omnopon/scopolamine; maintenance: thiopentone/suxamethonium/vecuroni- um/isoflurane/augmentin. Skin prep prewarmed (38-40°C), abdominal packs (40°C) duration of surgery 1-2h. Significant correlations found between age and theatre temperature, body fat, IV fluids, blood loss. Body fat correlated with theatre temperature.
Hind 1994b; prospective cohort study; country UK; total number of patients: 30	Age: 51.43 years (SD 12.01); range 37 to 76; ASA gradenot stated; temperature measured at oesophageal; no warming mechanisms stated	2nd of 2 multivariate analyses that fitted the data. Factors included: theatre temperature, body fat index, IV fluids, total blood loss (from univariate correlations). Excluded: surgery duration, theatre humidity. Constant: type of anaesthesia.	Type of anaesthesia: general; type of surgery: abdominal; theatre temperature 21.3°C(SD1.2); 19.6-23.3. Rh: 56% (4); 50- 65	All patients female and surgery was in afternoon. Elective gynaecological surgery. Ga: induction: omnopon/scopolamine; maintenance: thiopentone/ suxamethonium/ vecuronium/ isoflurane/augmentin. Skin prep prewarmed (38-40°C), abdominal packs (40°C) duration of surgery 1-2h. Significant correlations found between age and theatre temperature (high correlation), body fat, IV fluids, blood loss. Body fat correlated with theatre temperature.

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Kasai 2002; case control study; country Japan; total number of patients: 400	Age: 63 (SD11); ASA grade I-II; temperature measured at tympanic membrane; circulating water mattress 38 °C + warmed fluids	Age, height, weight, gender, preop systolic bp, preop core temperature, preop heart rate	Type of anaesthesia: combined general/regional; type of surgery: abdominal; theatre temperature 22 to 24°C	Cases >36.0°C; controls <35.0°C. Patients excluded if had blood transfusion or CV drugs for hypotension. Preop temp 36.7 °C (SD 0.6).
Kitamura 2000; prospective cohort study; country Japan; total number of patients: 27	Age: 59 and 62 years (SD12) (data given by subgroup); ASA grade: not stated; temperature measured at tympanic membrane; no warming devices	2 cohorts, diabetic & controls, divided into young and old controls, & diabetic neuropathy positive or not. All groups comparable for age, bmi, IV fluid rate, surgery duration, ambient temp. Constant: type of anaesthesia. Sig diff for diastolic bp in tilt	Type of anaesthesia: general; type of surgery: abdominal; theatre temperature 23°C	Unclear how cohorts selected. Patients with bmi > 28% excluded. No premeds. Induction fentanyl/propofol; maintenance 70% N ₂ O/isoflurane; IV fluids not warmed (10-15 ml/kg/h). Patients had FAW after study. 70-90% operations were >2h. No blood transfusion.

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Study details	Patient details	Factors adjusted for	Anaesthesia/surgery	Further details
Kongsa yareepong 2003; prospective cohort study; country Thailand; total number of patients: 184	Age: 15-93 years; ASA grade 19% ASA I; 55% ASA II; 26% ASA > II; temperature measured at tympanic membrane; some had active warming	Age, body weight, preop body temp, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temp monitoring used, type of anaesthesia, IV fluid, duration of surgery, ambient temp (+ univariate: gender, FAW, duration of anaesthesia)	Type of anaesthesia: mixed general/regional/combined; type of surgery: non-cardiac; theatre temperature mean 19.5 to 20.6°C (SD 1.9)	Patients <15y/hyperthermic excluded. 21% <41y; 47% 41-70y; 32% >70y. Multivariate analysis only contained those with p<0.2 in univariate analysis. 11/184 patients died. Preop temperature 37.0 (sd 0.7) range 34.5 to 39.3°C. 53/184 (29%) had temperature monitoring; 90/184 (49%) had FAW.
Kurz 1995; prospective cohort study; country Austria; total number of patients: 40	Age: mean 59 years (SD 14), range 26-79 y; ASA grade I-II; temperature measured at oesophageal; no wd but fluids warmed	Multivariate included gender, height, weight, % body fat, surface area and weight/surface area ratio. Type of surgery comparable for different size patients. Type of anaesthesia constant. No consideration taken of age or ASA grade.	Type of anaesthesia: general; type of surgery: abdominal; theatre temperature maintained at 21.0°C (SD 0.4)	Elective colon surgery; mean duration of surgery 3.8 h (SD 1.3). Irrigation fluids warmed to body temperature, but no warming devices or fluid warmers. GA: induction thiopental/fentanyl/vercuronium; maintenance isoflurane/60% N ₂ O/O ₂
Lau 2001; prospective cohort study; country China (Hong Kong); total number of patients: 18759	Age: 13% <15y; 62% 15- 64; 24% >65; ASA grade I: 52%; ASA II: 33%; ASA III 8%; ASA IV 2%; ASA V: 0.3%; not identified 4%; temperature measured at not stated; warming mechanism not stated	Age, ASA grade, type of anaesthesia, hospital. All of these were categorical variables.	Type of anaesthesia: mixed general/regional/combined; type of surgery: mixed; theatre temperature not stated	Only for patients having surgery greater than 2 h duration. All 23 public hospitals in Hong Kong June/July 1998. 13.4% patients were <15y. 69% elective. 45% major surgery; 29% intermediate. Theatre temperature, warming devices not mentioned.

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study details</i>	<i>Patient details</i>	<i>Factors adjusted for</i>	<i>Anaesthesia/surgery</i>	<i>Further details</i>
Mizobe 2005; RCT study; country Japan; total number of patients: 16	Age: 20 to 60 y; ASA grade I-II; temperature measured at oesophageal; no warming mechanisms stated	RCT. Comparable at baseline for age, gender, weight, height, arterial pressure, heart rate, core temperature	Type of anaesthesia: combined general/regional; type of surgery: abdominal; theatre temperature 24°C; rel humidity 40%	Positive end expiratory pressure (peep) 10cm H ₂ O vs zero end expiratory pressure (zeep). Lower abdominal surgery. Induction: propofol/vecuronium bromide; maintained: isoflurane/66%N ₂ O/O ₂ .
Morris 1971; prospective cohort study; country USA; total number of patients: 22	Age: mean 53 y (23 to 85); ASA grade; temperature measured at oesophageal; no warming mechanisms stated	Sub group analysis for age, theatre temperature, operative site and fluids infused. No significant difference in age or volume of fluids infused or site of op between lower and higher temperature theatres. Type of anaesthesia constant; surgery >2h.	Type of anaesthesia: general; type of surgery: abdominal; theatre temperature cool theatre 18-21°C; warm theatre 21-24°C	All operations lasted >2h and evaluated during 0-2h. Intra-abdominal. Premed varied. Ga: induction thiamylal/succinylcholine. Maintenance IV narcotic/N ₂ O (2-4l/m)/O ₂ (2l/m). Mean preop temperatures 36.9°C(SD 0.2)
Nakajima 2002; RCT study; country Japan; total number of patients: 16	Age: mean 47 to 52 y (range 20-60); ASA grade I-II; temperature measured at tympanic membrane; no warming mechanisms stated	RCT, comparable at baseline for age, gender, height, weight, heart rate, arterial pressure, theatre temperature, fluids, sensory block, pre-induction temperature	Type of anaesthesia: combined general/regional; type of surgery: abdominal; theatre temperature mean 23.9 to 24.2°C (SD 0.4); rel humidity 40%	Open lower abdominal surgery (colorectal or gynae). None obese. All fasted for 8h, am operations; positioned after 10min. In theatre 30 min before induction. GA: propofol induction, isoflurane/ 66%N ₂ O/O ₂ ; epidural: bupivacaine, median T9 or T10 (T7-T12)

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study details</i>	<i>Patient details</i>	<i>Factors adjusted for</i>	<i>Anaesthesia/surgery</i>	<i>Further details</i>
Nguyen 2001; RCT study; country USA; total number of patients: 101	Age: mean 43 to 48 years (SD 8); ASA gradenot stated; temperature measured at tympanic membrane; all had FAW but fluids not warmed	Type of anaesthesia: general; type of surgery: abdominal; theatre temperature 20 to 22°C	Gastric bypass. Stratified into twoBMI groups: 40-49 kg/m ² and 50-60 kg/m ² . All patients obese and <60y. All patients had compression sleeves and thigh high anti-embolic stockings. Midazolam premed; induction: pentothal+succinylcholine; fentanyl/isoflurane oral temperatures preoperatively; oesophageal intraoperatively and tympanic membrane postoperatively.	
Roberts 1994; retrospective cohort study; country USA; total number of patients: 77	Age: mean 51 years; ASA grade; temperature measured at oesophageal; no warming devices	Univariate analysis	Type of anaesthesia: general; type of surgery: urology; theatre temperature not stated	Percutaneous nephrolithotomy. Passive warming (hat, including plastic seal), room temperature fluids. Mean core temperature at induction 36.7°C.
Steinbrook 1997; RCT study; country USA; total number of patients: 13	Age: GA: 47years (SD 5); combined: 38 (SD 13); ASA gradeI-III (IV and above excluded); temperature measured at oesophageal; no warming devices	RCT. Comparable at baseline for height, blood loss, opioids, preop temperature. Not comparable for age, weight, intraoperative fluids (may not be significant difference).	Type of anaesthesia: mixed; type of surgery: abdominal; theatre temperature 20 to 22°C	All had premedication midazolam/fentanyl. Major intra-abdominal surgery. Fluids not warmed. FAW or fluid warming given if temperature <35°C. May be confounded by this process.

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study details</i>	<i>Patient details</i>	<i>Factors adjusted for</i>	<i>Anaesthesia/surgery</i>	<i>Further details</i>
Stewart 1998; prospective cohort study; country Australia; total number of patients: 107	Age.; ASA grade; temperature measured at bladder; all had active warming	Anova	Type of anaesthesia: mixed; type of surgery: abdominal; theatre temperature 22°C	This study was not considered further because it was confounded: all having open surgery had combined gen/epidural & all receiving laparoscopic surgery had general anaesthesia. All patients were warmed with a FAW set at 40°C and IV fluids were warmed
Vorrakitpokatorn 2006; prospective cohort study; country Thailand; total number of patients: 128	Age: 48.9 years (SD 13.54); 12.5% >65years; ASA grade I 59%; ASA II: 31%; ASA III 9%; temperature measured at tympanic membrane; no warming mechanisms stated	Age, duration of surgery, volume of irrigation fluid, blood transfusion units. Constant: type of anaesthesia.	Type of anaesthesia: general; type of surgery: urology; theatre temperature not stated	Age >18y; all patients had first time surgery for percutaneous nephrolithotomy. All patients had antibiotics. 56% had IPH intraoperatively. Some patients appeared to have FAW.
Yamakage 2000; prospective cohort study; country Japan; total number of patients: 60	Age: 58 years (SD10); ASA grade I-II; temperature measured at rectal; no warming devices but fluids warmed	Type of anaesthesia held constant at baseline: duration of anaesthesia effectively constant because considered at particular times less than duration of operation. Age partly adjusted in body fat calculator.	Type of anaesthesia: general; type of surgery: orthopaedic; theatre temperature 23.2°C(SD 0.7); rel humidity 31% (sd 8%)	Surgery on lumbar vertebrae (e.g. Disk herniation, spondylolisthesis); prone position. Premed pentobarbital. GA: induction thiopental/vercuronium; maintenance isoflurane/N ₂ O/O ₂ ; fluids warmed to 37°C. Initial temperature 37.1°C(SD 0.4).

C3: CONSEQUENCES OF INADVERTENT PERIOPERATIVE HYPOTHERMIA - RCT STUDIES

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Bennett 1994 Trial held in UK	<p>Inclusion: Patients undergoing hip arthroplasty; Exclusion: patients who were grossly obese or malnourished or who had endocrine abnormalities or pyrexia Age (range):71(range 59-88): 74 (range 54-84); 73 (range 63-89); gender (m/f): 30:15; Duration of surgery: 2.0 hours (SD 0.3); 2.5 hours (SD 0.6); 2.3 hours (SD 0.3); Comorbidities: not stated; ambient temperature: 19-21°C; IV at ambient temperature at rate of 6ml/kg/h. Blood warmed to 37°C before infusion. Relative humidity maintained at 40-50%; ambient temperature (recovery)-23-25°C</p>	<ol style="list-style-type: none"> 1) Metallized plastic garment (Thermolite, techstyles (thermal insulation); duration: after induction until end of surgery; n=15 2) usual care; duration: not stated; n=15 3) Convective warm air blanket (Bair Hugger); 43°C; n=15
Casati 1999 Trial held in Italy	<p>Inclusion: patients undergoing total hip astthroplasty Exclusion: patients with severe CV and respiratory disease, obese, thyroid disease, dysautonomi or Raynaud's syndrome Age (range):68 years (SD 11): 66 (SD 7); gender (m/f): not stated; Duration of surgery: 100 min (SD 37): 105 (SD 18); Comorbidities: not stated; 3 ml of Ringer's solution infused every 1ml of blood loss; all patients were in supine position; autologus blood warmed to 37°C before infusion</p>	<ol style="list-style-type: none"> 1) Forced air warming (Bair Hugger) + IV Ringer's solution (37°C) (active warming device); duration: after loss of sensation at t10 until end of surgery; not stated; n=25 2) Reflective blankets (thermal insulation); duration: after loss of sensation at t10 until end of surgery; n=25

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Fleisher 1998 Trial held in USA	<p>Inclusion: patients classified as ASA physical status I, II, or III, aged 18 to 85 yr scheduled for gynaecologic, plastic orthopaedic, or general surgery and for post surgical admission to one PACU location, included elective surgery scheduled for at least 2h and the use of general endotracheal anaesthesia</p> <p>Exclusion: patients with coronary artery disease, combined general and regional anaesthesia, perioperative fever (>38°C oral), minor peripheral procedures, factors that precluded the use of a lower body FAW blanket (i.e. use of leg stirrups or lower extremity surgery)</p> <p>Age (range): 45 years (SD3) (for 95/99 patients included) (18 to 85); gender (m/f): 18:77 (of 95 patients included)</p> <p>Comorbidities: not stated; room temperature: 21°C; core temperatures maintained between 34.5°C and 38°C in all patients and if increased to >38°C anaesthesiology and surgical teams were notified; extubation based on criteria of adequate spontaneous ventilation, return of airway reflexes, sustained head lift for 5s as determined by anaesthesiologist; times from completion of surgical dressing until extubation measured in both groups and used as a measure of post surgical emergence time from anaesthesia</p>	<ol style="list-style-type: none"> 1) Forced-air warming cover (Mallinckrodt Medical) + prewarmed crystalloid, passive airway humidification and a lower extremity warming blanket completely covered by a cotton blanket and surgical drapes; units turned on to high and high flow settings after drapes placed; duration: not stated; duration: discontinued once temperature increased to >34.5°C; n=48 2) Routine thermal care + prewarmed crystalloid, passive airway humidification and a lower extremity warming blanket completely covered by a cotton blanket and surgical drapes; blankets connected to warming unit which was turned on but not programmed to deliver air; duration: not stated; if routine thermal care temperature decreased to <34.5 FAW initiated to prevent decrease in core temperature; n=47

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Frank 1995 Trial held in USA</p>	<p>Inclusion: patients age > 60 years; scheduled for lower vascular, abdominal or thoracic procedures; presence of 2 or more risk factors for CAD Exclusion: patients with ECG abnormalities, preoperative temperature < 36°C or > 38°C; history of Raynaud's or thyroid disease Age (range):71 (SEM 1); gender (m/f): 85:82 Comorbidities: not stated; room temperature: 21°C; endotracheal tube removed at end of surgery unless standard extubation criteria not met; in PACU for the control group: warmed blankets placed over patients at nurse's discretion; FAW group: intervention continued for 2 hr and similar to control group</p>	<ol style="list-style-type: none"> 1) Forced-air warming cover (Mallinckrodt Medical) + IV fluid and blood warmed (model bw-5) + HME (thermovent) (active patients + active fl); duration: not stated; set at height and adjusted to maintain core temperature at 37°C; n=37 2) Warmed IV fluids (usual care+ active fl); duration: not stated; n=37
<p>Frank 1997 Trial held in USA</p>	<p>Inclusion: patients age > 60 years; scheduled for peripheral vascular, abdominal or thoracic procedures; scheduled for postoperative admission to theICU; documented or at high risk of CAD (age criterion to preselect patients at risk for both perioperative CV complications and inadvertent hypothermia) Exclusion: patients with ecg abnormalities, preoperative temperature < 36°C or > 38°C; patients with Raynaud's or thyroid disease Age (range):71; gender (m/f): 85:82 Comorbidities: not stated; room temperature: 21°C; endotracheal tube removed at end of surgery unless standard extubation criteria not met; surgery duration 3.4 and 3.6h (SEM 1.1)</p>	<ol style="list-style-type: none"> 1) Forced-air warming cover (Mallinckrodt Medical) + IV fluid and blood warmed (model bw-5) + HME (thermovent) (active patients + active fl); duration: not stated; set to maintain core temperature at 37°C; n=142 2) 1 layer of paper of surgical field+ IV fluid and blood warmed + heat moisture exchanger (usual care+ active fl); duration: not stated; n=158

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Hofer 2005 Trial held in Switzerland	<p>Inclusion: Patients undergoing elective multiple off-pump coronary artery bypass grafting, with preserved left ventricular function (ejection fraction >40%), absence of platelet glycoprotein inhibitor therapy, preoperative hematocrit 30% or higher, preoperative normothermia and no pre-existing coagulation disorders.</p> <p>Age: 66.3 years (SD 10.9): 64.4 (SD 10.7): 65.6 (SD 11.8); gender (m/f): 72:18; All patients received warmed transfusions (40°C); Duration of surgery: 232 min (SD 65): 248 (SD 46): 249 (SD 68)</p>	<ol style="list-style-type: none"> 1) Forced air warming (Warm Touch; Mallinckrodt Inc); (active warming device); duration:after induction of anaesthesia; 42oC; n=29 2) Electric blanket (Thermamed SmartCare OP; (active warming device) system); duration:after induction of anaesthesia;42oC; n=30 3) Water garment (Allon 2001 system; MTRE); (active warming device); duration:after induction of anaesthesia; 36.7oC; n=29
Johansson 1999 Trial held in Sweden	<p>Inclusion: elective total unilateral primary hip arthroplasty, no pathologic fracture, no anamnestic evidence of coagulopathy, and prothrombin and activated partial thrombin time within normal limits. Age (range):69 (SD 7): 67 (SD 7); gender (m/f): 21:29; comorbidities: not stated; Duration of surgery: 102 min (SD 20): 100 min (SD 23); Premedication: diazepam, 5 mg by mouth used for sedation; ephedrine (5(7.6) v 4.3(6) mg); midazolam IV (2(1.8) v 1.3(1.5)mg); NSAIDs/aspirin discontinued 1 wk before operation in 8 patients in each group; fl and blood warmed; or temperature: 20.9°C</p>	<ol style="list-style-type: none"> 1) Bair hugger (Augustine Medical) + pre-warmed gel-filled mattress + warmed fluids (active patients + active pt); duration: not stated; n=25 2) Usual care + pre-warmed gel-filled mattress + warmed fluids (active warming device); duration: not stated; n=25

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Kurz 1996 Trial held in USA	<p>Inclusion: colorectal resection for cancer or IBD; surgery duration 3.1 h (SD 1.0)</p> <p>Exclusion: patients scheduled for minor colon surgery, use of corticosteroids or other immunosuppressive drugs including cancer chemo 4 weeks before surgery; recent history of fever, infection or both; serious malnutrition or bowel obstruction</p> <p>Age (range):60 years (18-80); gender (m/f): 108:92 comorbidities: not stated; inflammatory bowel disease; mechanical bowel prep night before surgery</p>	<ol style="list-style-type: none"> 1) Forced air cover (Augustine Medical) + warmed IV fluids (fluid warmer)-activated (active warming device); duration: not stated; 40°C; n=104 2) Forced air cover (Augustine Medical) + warmed IV fluids (fluid warmer)- not activated (active + passive); duration: not stated; 'ambient temperature'; n=96
Lenhardt 1997 Trial held in USA	<p>Inclusion: patients aged 18-80 years undergoing abdominal surgery (colon resection with or without abdominal peritoneal pull stable, systemic disease); ASA I-III; Exclusion: patients scheduled for minor abdominal surgery; Duration of surgery: 3.4 hours (SD 1.2): 3.2 (SD 1.1)</p> <p>Age (range):56 (SD 17): 55 (SD 16); gender (m/f): 74:76 Comorbidities: not stated; 100 of the patients participated in kurz 1996</p>	<ol style="list-style-type: none"> 1) Extra warming (active warming device); duration: not stated; core temperature maintained near 36.5°C; n=74 2) usual care; duration: not stated; n=76
Mason 1998 Trial held in USA	<p>Inclusion: Roux-en-y gastric bypass surgery for morbid obesity</p> <p>Exclusion criteria not stated</p> <p>Age (range): 38.5 (SD 6.1): 40.7 (SD9.6); (17-59 years); gender (m/f): 9:55; Duration of surgery: 156.1 min (SD 27.4): 156.9 (SD 31.6)comorbidities: not stated; or temperature: 20.9°C; PACU temperature: 24.75°C</p> <p>*significantly different between the groups length of incision (cm). Length of incision longer in warmed blanket group</p>	<ol style="list-style-type: none"> 1) Forced air warming [Bair Hugger (Model 500 Augustine Medical)] (active warming device); duration: not stated; 'medium'= 38°C (SD 3); n=32 2) Warmed cotton blankets (active warming device); duration: not stated; n=32

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Scott 2001 Trial held in UK</p>	<p>Inclusion: Patients over 40 years undergoing orthopaedic, colorectal, gastrointestinal, urological and vascular surgery; ASA I-IV; undergoing major surgery with an expected hospital stay of 5 days; no existing sacral pressure ulcers and provided informed consent Exclusion: patients undergoing procedures in which intraoperative warming standard practice; lateral or prone position Age (range):68.4 years (SD 9.1): 68.2 (SD 9.2) (41-89); gender (m/f): 149:175; Duration of surgery: 111 min (SD 47.4): 115.5 (SD 46.8); comorbidities: not stated; 27 protocol violations; 17 patients allocated to warming treated as usual care and 10 patients assigned to usual care given warming because of clinical need; some control patients may have received warmed IV fluids</p>	<ol style="list-style-type: none"> 1) Forced air warming + warmed IV fluids (active warming device); duration: not stated; n=161 2) Usual care + warmed IV infusions, as determined by clinical need.usual care; duration: not stated; n=163
<p>Smith 1998 Trial held in USA Funding: not stated</p>	<p>Inclusion: type of surgery: laparascopy (74%), hysterectomy (21%), cone biopsy (14%); Exclusion: head injury, otitis, and preoperative temperature greater or equal to 38°C or less than or equal to 35.5°C and patients taking calcium channel blockers. Age: 33 (SEM 2); Surgery type: elective; surgical speciality: gynaecology; Duration of surgery: 67 min (SEM 16): 75 (SEM 15) Anaesthesia type: general; anaesthesia duration more than 1h; premed: not stated; ASA grade: I-III; age (range): 33; gender (m/f): 0:38; BMI: not stated; comorbidities: not stated; gas flow: 2l/min;room temp:@ 21°C;</p>	<ol style="list-style-type: none"> 1) Hotline (Level 1) (active fl); duration: until end of surgery; then room temperature fluids; set point: 42°C (delivers at 38-39 °C); n=18 2) Room temperature fluids usual care; duration: not stated; 21°C; n=20

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

Study	Participants	Interventions
<p>Smith 2007 Trial held in USA Funding: metro-Health medical center, Smiths medical and inc (formerly Sims)</p>	<p>Inclusion: gynaecological, orthopaedic, urological, general surgery scheduled >30mins</p> <p>Exclusion: <18/>85 years; abnormal bleeding; malignant Hyperthermia (or fh); pre-operation temperature >38/<35 c, chemo/major <input type="checkbox"/> rvine <input type="checkbox"/> last 3 mo; immuno-suppressed/steroids last 2 wk; coagulatinins/vasospasm; pregnancy</p> <p>Perioperative phase: pre and intra; surgery type: elective; surgical speciality: mixed surgery Duration: 30 to 60 min; anaesthesia type: general; anaesthesia duration more than 1h; premed: midazolam; some patients ASA grade: mixed Age (range): 40 and/-13 years; gender (m/f): 98: 238; BMI: not stated; comorbidities: not stated; 6 patients in each group had diabetes; 67 and 72 were smokers; ambient temperature 21°C; temperature measures; sublingually pre-operation and postoperatively and oesophageal or nasopharyngeal intra-operatively</p>	<ol style="list-style-type: none"> 1) Snuggle warm convective warming system, Sims, <input type="checkbox"/> rvine, ca and warmed IV fluids (active warming device); duration: aim for 30 mins; actually 42 and/-38 min pre- and intra-op; 40 and/-1 degree c; intervention body area covered: 40%; proportion covered; n=156 2) Convective air warming and/or warmed IV fluids at discretion of anaesthetist usual care; duration: not stated; control body area covered:; proportion covered: not stated; n=180
<p>Widman 2002 Trial held in Sweden RCT</p>	<p>Inclusion and exclusion criteria: age: 67 (SD 7) years; gender (m/f): 23: 23; comorbidities: not stated; ambient temperature 21°C. Hip arthroplasty; duration of surgery 78 (SD 15) and 80 (SD 20) min</p>	<ol style="list-style-type: none"> 1) Amino acid (amino acid); duration: 1 h before surgery and during; n=22 2) Acetated Ringer's solution (placebo); duration: not stated; n=24

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Wills 2001 Trial held in Australia Funding: Cook Medical loaned equipment</p>	<p>Inclusion criteria: laparoscopic fundoplication; Exclusion: if patient allergic to morphine, large hiatal hernia (>6cm), previous oesophageal surgery, requiring concomitant procedure such as cholecystectomy, postoperative intubation, conversion to an open procedure Surgery type: elective; surgical speciality: Surgery duration: 30 to 60 min Anaesthesia type: general; anaesthesia duration not stated; premed: midazolam (0.1mg/kg) i.m; ASA grade: not stated; age (range): 47.5 (21-71): 52.2 (28-74); gender (m/f): 22:18; BMI: 28 kg/m² comorbidities: not stated; Warming device placed over the upper torso and head (Bair Hugger); OR temp: 20 to 22°C.</p>	<ol style="list-style-type: none"> 1) Heated CO₂ (lins-2000, Cook Australia) (active pt + active gas); duration: not stated; 22 to 30.5°C (at 1 to 6 l/min); n= 19 2) Standard CO₂ (active pt + usual care gas); duration: not stated; amount; n=21
<p>Winkler 2000 Trial held in Austria</p>	<p>Inclusion: patients scheduled to undergo primary, unilateral, cement-free total hip arthroplasty. None performed for treatment of tumour Exclusion: preoperative coagulation tests abnormal, aspirin products consumed within a week of surgery, history of bleeding disorders, dvt, pulmonary embolism Age (range): 64.5 (40-80) years; gender (m/f): 65:85 comorbidities: not stated; concurrent treatments, ward temperature, irrigation fluid, IV fluid, humidity, air flow</p>	<ol style="list-style-type: none"> 1) Forced air covers attached to individual forced air heater (Bair Hugger, Augustine Medical) (active warming device); duration: not stated; temperature adjusted to maintain core temperature at 36.5°C; n=75 2) Forced air covers attached to individual forced air heater (Bair Hugger, Augustine Medical) (active warming device); duration: not stated; temperature adjusted to maintain core temperature at 36.0°C; n=75

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Zhao 2005 Trial held in China Funding: not stated</p>	<p>Inclusion & exclusion criteria: inc: Patients scheduled for abdominal surgery lasting at least 2 hours; Ex: pts w/coagulation disorder, severe malnutrition (total plasma albumin <3.0 g/l, white blood count <2.5x10⁹/l), recent history of fever or infection, history of endocrine disease; Patients with recent use of immunosuppressants perioperative phase: intrafluids Surgery type: not stated; surgical speciality: not stated; surgery duration: not stated Anaesthesia type: general; anaesthesia duration more than 1h; Premedication; no; ASA grade: I-II; age (range):52(SD 13): 44 (SD 15); 18-70; gender (m/f): 23:17; BMI: not stated comorbidities: not stated; Concurrent treatments, ward temperature, irrigation fluid, IV fluid, humidity, air flow *FAW: lowered to medium 41-42 if core temperature went above 37.8oC. Colloid infusion: 800 ml (SD 474) v 945 (SD 394);</p>	<ol style="list-style-type: none"> 1) Forced air warming + actively warmed intravenous solutions including blood (39°C (active pt + active fl); duration: not stated; FAW: high (42-43°C)*fluid: warmflo:39°C; n=20 2) Single layer of cotton sheet usual care; duration: not stated; amount; n=20

C4: CONSEQUENCES OF HYPOTHERMIA - COHORT STUDIES

<i>Study details</i>	<i>Patient details</i>	<i>Factors adjusted for</i>	<i>Anaesthesia/surgery</i>	<i>Further details</i>
Surgical wound infection				
Flores Maldonado 2001; prospective cohort study; country Mexico; total N=290	Age: 40 (SD 12) years; ASA grade I (77%) and II (23%); temperature measured at tympanic membrane; surgical wound infection	Age, diabetes mellitus precedents, prophylactic antibiotic, non-prophylactic antibiotic, wound drains, surgical time, mild IPH (7). Only one hospital so constant.	Type of anaesthesia: general; type of surgery: abdominal; theatre temperature	Clean-contaminated surgery only; surgical time <120 min; hospital stay <2 days; positive or negative precedents of diabetes. Exclusions: blood transfusion 30 d before or during operation or 30 d after. PACU temperature >38 °C; respiratory or ear infections; single hospital. SWI task force definition+positive cultures. All had major elective surgery. 20 patients had SWI. Cholecystectomy.
Walz 2006; retrospective cohort study; country USA; total N=1472	Age: median 57 (range 18-96) years; ASA grade I (6%), II (46%), III (40%), IV (7%), V (1%); temperature measured at not stated; surgical wound infection	Perioperative transfusion, intraoperative temperature nadir, presence of current infection, wound class, surgical time (> or <4h), perioperative antibiotics (6)	Type of anaesthesia: mixed general/regional/combined; type of surgery: abdominal; theatre temperature not stated	Multi-centre study. Data from University database Sept-Dec 2002; excluded if HLoS was >3SD from median (n=26). Surgery of small bowel and colon only. Elective/urgent/emergent surgery. 51% bowel prep.; Rate of SSI: Clean-contaminated wounds 7.9% of 1233, contaminated 12% of 125, dirty/infected 20.4% of 49 (total 122). 3% patients had current infection.

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study details</i>	<i>Patient details</i>	<i>Factors adjusted for</i>	<i>Anaesthesia/surgery</i>	<i>Further details</i>
Morbid cardiac event				
Frank 1993; prospective cohort study; country USA; total N=100	Age: 65 years mean (SEM 2); 35-94 years; ASA grade; temperature measured at sublingual reliable; morbid cardiac event	Age >65y; gender; preoperative diabetes; smoking; hypertension; beta blockade; angina; history of MI; prior coronary artery bypass surgery; type of anaesthesia; temperature on admission to ICU; postoperative shivering; postop haemocrit; intraop blood loss	Type of anaesthesia: mixed general/regional groups; type of surgery: vascular; theatre temperature 21 to 24 °C	Patients from RCT of anaesthesia type. Multicentre study. Lower extremity vascular surgery (expected high incidence of CA disease and perioperative morbidity). Exclusions: left bundle branch block, pacemaker rhythm, LV hypertrophy with strain pattern. Sublingual temperatures placed by experienced nurses. No warming apart from fluids. Outcome myocardial ischaemia. 21 events.
Blood				
Stapelfeldt 1996; retrospective cohort study; country USA; total N=100	Age: not stated; ASA grade not stated; temperature measured at not stated; blood transfusion intraoperatively	Unclear: probably baseline platelet count, Hgb levels, intraoperative PC and Hgb, duration of operative stages x 3, time in hypothermic state x 2 (minimum 9)	Type of anaesthesia: not stated; type of surgery: liver transplant; theatre temperature not stated	Abstract - limited details. 100 most recent liver transplant records from the VA Medical Center. Average number of units transfused per case hour was outcome measure.
Vorrakitpokatorn 2006; prospective cohort study; country Thailand; total N=128	Age: 48.9 y (SD 13.54); 12.5% >65y; ASA grade ASA I 59%; ASA II 31%; ASA III 9%; temperature measured at tympanic membrane; blood transfusion intraoperatively	Age, duration of surgery, volume of irrigation fluid, intraoperative hypothermia (4)	Type of anaesthesia: general; type of surgery: urology; theatre temperature not stated	All patients had first time surgery for percutaneous nephrolithotomy. All patients had antibiotics. Some patients appeared to have FAW; Intraoperative blood transfusion required for 16% of patients (19) and the maximum transfusion was 2 units in 7.6% patients.

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<i>Study details</i>	<i>Patient details</i>	<i>Factors adjusted for</i>	<i>Anaesthesia/surgery</i>	<i>Further details</i>
Blood transfusion postoperatively				
Vorrakitpokatorn 2006; prospective cohort study; country Thailand; total N=128	Age: 48.9 y (SD 13.54); 12.5% >65y; ASA grade ASA I 59%; ASA II 31%; ASA III 9%; temperature measured at tympanic membrane; blood transfusion postoperatively	Age, duration of surgery, intraoperative transfusion, volume of irrigation fluid, postoperative fever, intraoperative hypothermia (5)	Type of anaesthesia: general; type of surgery: urology; theatre temperature not stated	All patients had first time surgery for percutaneous nephrolithotomy. All patients had antibiotics. Some patients appeared to have FAW. Postoperative blood transfusion required for 20.2% of patients (26).
Death				
Abelha 2005; prospective cohort study; country Portugal; total N=185	Age: ; ASA grade ASA I 3%, ASA II 39%, ASA III 49%, ASA IV 10%.; temperature measured at tympanic membrane; death	Temperature on admission, SAPS II, magnitude of surgery, type of surgery, ICU length of stay, hospital length of stay, BMI, body weight (8)	Type of anaesthesia: mixed general/regional groups; type of surgery: non-cardiac; theatre temperature 20-22°C (not adjusted for)	14 deaths
Bush 1995; part prospective part retrospective study; country USA; total N=262	Age: 70.3 (SD 1.3) and 73.1 (SD 1.0); ASA gradenot stated; temperature measured at pulmonary artery; death	Norepinephrine therapy, dobutamine therapy, acute MI, multiple organ dysfunctions (4). Some other variables may have been used but were non-significant. Unclear if IPH included	Type of anaesthesia: general; type of surgery: abdominal aortic aneurysms; theatre temperature not stated	Data collected from ICU/PACU patients following elective aortic aneurysm repairs. Postop data were collected prospectively. All patients with T<36.0 were rewarmed in ICU. In hospital mortality rate. 4.2% N= 11
Janczyk 2004; retrospective cohort study; country USA; total N=100	Age: 74 (SD 8.6) years; ASA gradenot stated; temperature measured at not stated; death	Age, gender, blood volume transfused, crystalloid volume, intraoperative base deficit, lowest intraop temperature, lowest intraop systolic blood pressure, preop haemoglobin, lowest preop bp, operating room time (10)	Type of anaesthesia: not stated; type of surgery: abdominal aortic aneurysms; theatre temperature not stated	Surgery for ruptured aortic aneurysm; 70% men. Emergency surgery; 47 deaths

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<i>Study details</i>	<i>Patient details</i>	<i>Factors adjusted for</i>	<i>Anaesthesia/surgery</i>	<i>Further details</i>
ICU length of stay				
Abelha 2005; prospective cohort study; country Portugal; total N=185	Age: ; ASA grade ASA I 3%, ASA II 39%, ASA III 49%, ASA IV 10%.; temperature measured at tympanic membrane; ICU length of stay	Temperature on admission, previous temperature in ward, ASA , SAPS II, magnitude of surgery, type of anaesthesia, use of temperature monitoring, use of warming technique, total IVcrystalloids, total packed erythrocytes, duration of anaesthesia, BMI (9)	Type of anaesthesia: mixed general/regional groups; type of surgery: non-cardiac; theatre temperature 20-22 °C (not adjusted for)	Outcome measured was number of patients with length of stay longer than 2 days, of which 25.4% (n=47) had this outcome.
Hospital length of stay				
Bush 1995; part prospective part retrospective study; country USA; total N=262	Age: 70.3 (SD 1.3) and 73.1 (SD 1.0); ASA gradenot stated; temperature measured at pulmonary artery; hospital length of stay	Multiple organ dysfunction, aneurysm diameter, low body temperature (3). Some other variables may have been used but were non-significant,	Type of anaesthesia: general; type of surgery: abdominal aortic aneurysms; theatre temperature not stated	Data collected from ICU/PACU patients following elective aortic aneurysm repairs. Postop data were collected prospectively. All patients with T<36.0 were rewarmed in ICU.; Outcome measured was prolonged hospital length of stay, but 'prolonged' not defined

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<i>Study details</i>	<i>Patient details</i>	<i>Factors adjusted for</i>	<i>Anaesthesia/surgery</i>	<i>Further details</i>
Hospital length of stay				
Selldén 1999; prospective cohort study; country Sweden; total N= 75	Age: 49 (SD 0.7) and 50 (0.5) years; ASA grade I only; temperature measured at pulmonary artery and rectal; hospital length of stay	Age, height, weight, gender, baseline temperature, awakening temperature, duration of surgery, amino acids (8)	Type of anaesthesia: general; type of surgery: abdominal; theatre temperature 20 to 23 °C	Patients from quasi RCT and RCT+non-randomised patients. General abdominal surgery (26/75) and hysterectomy. Amino Acid treated group HLoS 6.4 (SD 2) days; control 8.2 (SD 4).
Vorrakitpokatorn 2006; prospective cohort study; country Thailand; total N=128	Age: 48.9 y (SD 13.54); 12.5% >65y; ASA grade I 59%; ASA II 31%; ASA III 9%; temperature measured at tympanic membrane; hospital length of stay	Age, duration of surgery, intraoperative blood transfusion, volume of irrigation fluid, postoperative blood transfusion, postoperative fever, intraoperative hypothermia (7)	Type of anaesthesia: general; type of surgery: urology; theatre temperature not stated	All patients had first time surgery for percutaneous nephrolithotomy. All patients had antibiotics. Some patients appeared to have FAW. Postoperative length of stay reported as number of patients with LoS ≥ 5 days; 57/117 (49%) had longer stay.

C5: PREOPERATIVE WARMING DEVICES

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Camus 1995 Trial held in France Funding: mallinckrodt products donated thermocouples</p>	<p>Perioperative phase: preoperative; surgery type: elective; surgical speciality: abdominal; surgery duration: not stated Anaesthesia type: general; anaesthesia duration: more than 1h; premedication: oral hydroxyzine 100mg one hr prior to surgery All patients; ASA grade: I-II Age (range): 44; gender (m/f): 5:11; BMI: not stated comorbidities: not stated; preoperative ambient temperature was significantly higher in the prewarmed group than control group; intraoperative temperature was not significantly different between the groups; IV fluid: infused at ambient temperature and same volume used for both groups; gas flow: 2 l/min</p>	<ol style="list-style-type: none"> 1) Forced air warming (Bair Hugger model 500) and a cotton sheet placed over the forced-air warming cover (active + passive); duration: 60 min (1); temperature setting at 41°C; intervention body area covered: covered up to the shoulders; proportion covered ≥ 50% treated; n=8 2) Wool blanket (usual treatment); duration: not stated; control body area covered: not stated; proportion covered not stated; n=8
<p>Fossum 2001 Trial held in USA Funding: augustine medical-equipment & financial support</p>	<p>Perioperative phase: preoperative; surgery type: not stated; surgical speciality: mixed; surgery duration: not stated Anaesthesia type: general; anaesthesia duration: more than 1h; premedication: not stated ASA grade: mixed Age (range): 45.23 years; gender (m/f): 57:43; BMI: not stated comorbidities: not stated; patients with hypothyroidism</p>	<ol style="list-style-type: none"> 1) Forced warm air(Bair hugger model # 505) and warmed single layer cotton blanket (active warming device); duration: 45 min; temperature at 38 (3)°C; intervention body area covered: not stated; proportion covered not stated; n=50 2) Single cotton sheet warmed in a continental metal products blanket warmer(model#sw1ae-24) (active warming device); duration: 45 min; warmed at 66°Control body area covered: not stated; proportion covered not stated; n=50

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Just 1993 Trial held in USA Funding: not stated</p>	<p>Perioperative phase: preoperative; surgery type: elective; surgical speciality: orthopaedics; surgery duration: over 3 h Anaesthesia type: general; anaesthesia duration: not stated; premedication: flunitrazepam (1 mg) orally 1 hr prior ASA grade: I-II Age (range): 64 (60-68 years); gender (m/f): 8:8; BMI: not stated comorbidities: not stated; Ambient temperature: 21-23°C; or temperature: 21-22°C; gas flow of 2 l/min</p>	<ol style="list-style-type: none"> 1) Electric blanket (cm-an220, chromex) + sheet (warmed) (active warming device); duration: 90 min; 42-43°C; intervention body area covered: during surgery shoulders and thorax covered; proportion covered not stated; n=8 2) Paper shirt covered with cotton sheet (passive warming device); duration: until during surgery; not stated control body area covered: during surgery-covered shoulders and thorax; proportion covered not stated; n= 8
<p>Melling 2001 Trial held in UK Funding: smith & nephew foundation; augustine medical inc</p>	<p>Perioperative phase: preoperative; surgery type: elective; surgical speciality: mixed; surgery duration: 1 to 3 h Anaesthesia type: not stated/unclear; anaesthesia duration: not stated; premedication: not stated ASA grade: not stated Age (range): not stated; gender (m/f): 119:158; BMI: comorbidities: not stated; mean duration of surgery: 48 to 49.5 min</p>	<ol style="list-style-type: none"> 1) Forced air warming blanket-systemic warming (active warming device); duration: 30 min (left on until just before surgery) (average: 44.94min); not stated; intervention body area covered: whole body; proportion covered; n=139 2) Non contact radiant heat dressing- local warming; usual care; duration: 30 min (average: 38.73min); not stated control body area covered.; proportion covered wound treated only; n=138

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Sheng 2003 (1) Trial held in USA Funding: not stated</p>	<p>Perioperative phase: preoperative; surgery type: not stated; surgical speciality; surgery duration: not stated Anaesthesia type: not stated/unclear; anaesthesia duration; premedication: not stated; ASA grade: mixed Age (range): 37.5 years; gender (m/f): 23:30; BMI: not stated comorbidities: not stated; outpatient setting surgery; holding room temperature: not stated; or temperature: 21°C ;iv fluid: room temperature</p>	<ol style="list-style-type: none"> 1) Reflective hat and jackets (thermo-lite) (passive warming device); duration: on arrival to outpatients clinic and just prior to transfer to or; intervention body area covered: not stated; proportion covered: not stated; n=26 2) No hats or jackets; usual care; duration: not stated; control body area covered; proportion covered: not stated; n=26
<p>Sheng 2003 (2) Trial held in USA Funding: not stated</p>	<p>Perioperative phase: preoperative; surgery type: not stated; surgical speciality; surgery duration: not stated; Anaesthesia type: not stated/unclear; anaesthesia duration; premedication: not stated ASA grade: mixed Age (range): 37.5 years; gender (m/f): 23:28; BMI: not stated comorbidities: not stated; outpatient setting surgery; holding room temperature: not stated; or temperature: 21°C; IV fluid: room temperature</p>	<ol style="list-style-type: none"> 1) Reflective hat (thermolite) (passive warming device); duration: upon arrival int°Clinic and removed prior to transfer to or; intervention body area covered: head; proportion covered not stated; n=30 2) No warming; usual care; duration: not stated; control body area covered.; proportion covered; n=23

C6: INTRAOPERATIVE WARMING DEVICES

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Baxendale 2007 Trial held in UK	Inclusion: major abdominal or orthopaedic surgery Age (range):not stated; gender (m/f): not stated comorbidities: not stated; all patients received IV fluids warmed via a Bair Hugger hose thought surgery. Numbers randomised to each group not stated; n=80	1) Bair Hugger (active warming device); duration: after induction for the duration of surgery; 43°C; n=not stated 2) Inditherm mattress (active warming device); duration: from induction until transfer to recovery unit; 37°C; n=not stated
Bennett 1994 Trial held in UK	Inclusion: Patients undergoing hip arthroplasty; Exclusion: patients who were grossly obese or malnourished or who had endocrine abnormalities or pyrexia Age (range):71(range 59-88): 74 (range 54-84); 73 (range 63-89): gender (m/f): 30:15; Duration of surgery: 2.0 hours (SD 0.3): 2.5 hours (SD 0.6): 2.3 hours (SD 0.3); comorbidities: not stated; ambient temperature: 19-21°C; IV at ambient temperature at rate of 6ml/kg/h. Blood warmed to 37°C before infusion. Relative humidity maintained at 40-50%; ambient temperature (recovery)-23-25°C	1) Metallized plastic garment (thermolite, techstyles (thermal insulation); duration: after induction until end of surgery; n=15 2) usual care; duration: not stated; n=15 3) Convective warm air blanket (Bair Hugger); 43°C; n=15
Berti 1997 Trial held in Italy	Inclusion: Patients undergoing total knee or hip arthroplasty. None of the subjects were obese, taking medications, or history of thyroid disease, dyautonomia or Raynaud's syndrome; Exclusion criteria not stated. Age (range):68 years; gender (m/f): not stated comorbidities: not stated; room temperature: 21-23°C; IV fluid and skin disinfectants:room temperature; laminar air flow humidity maintained 40-45%	1) FAW (Bair Hugger, Augustine Medical + low flow anaesthesia (active warming device; duration: not stated; 38°C; n=10 2) Low flow anaesthesia (heat retentive therapy); duration: not stated; n/r; n=10 3) Insulated blanket (thermadrape) + low drape anaesthesia system; covering head, trunk, upper limbs and unoperated lower limb

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Borms 1994 Trial held in Belgium</p>	<p>Inclusion: total hip arthroplasty Exclusion: no patients had infections, fever, metabolic disease including diabetes and thyroid dysfunction Age (range):68.5(55-75); gender (m/f): 5:15 Comorbidities: not stated; IV fluid warmed to 37°C; inspiratory gases humidified by hme; or temperature -19°C; ventilation: maintain P_{ET} CO₂ 35mmhg; gas flow: 4l/min; in both groups, the dependent leg was covered with single layer of cotton shirt and disposable surgical drape</p>	<p>1) FAW, lower body cover (model 525, Augustine medical inc + single blanket + warmed IV fluid (active warming device; duration: applied immediately after patients positioned laterally; 'high'-40°C; n=10 2) Reflective thermoplastic aluminium composite (thermo-lite) + warmed IV fluid (thermal insulation); duration: not stated; n=10</p>
<p>Bourke 1984(study 1) Trial held in USA</p>	<p>Type of surgery: carotid endarterectomy Age (range):not stated; gender (m/f): not stated comorbidities: not stated; or temperature: 19.5°C; humidity: 47%</p>	<p>1) Aluminized blanket + surgical drape (thermal insulation; duration: not stated; n=30 2) Surgical draping usual care; duration: not stated; n=30</p>
<p>Bourke 1984(study 2) Trial held in USA</p>	<p>Patients undergoing neurosurgery. Age (range):not stated; gender (m/f): not stated Comorbidities: not stated; all patients rested on active warming blankets, equilibrated to room temperature .device turned on between 3-4hrin the control group. Or temperature: 19.7°C; humidity: 49%; shivering not assessed as some patients remained intubated and paralysed</p>	<p>1) Aluminized blanket (thermal insulation; duration: not stated; n=15 2) Usual care (active warming device); duration: not stated; n=15 All patients rested on an active heating pad equilibrated to the room temperature; this was turned on after 3 hr for the patients in the control group</p>

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Camus 1993a Trial held in France	Inclusion: surgery lasting 2h; none were obese, febrile, or had a history of endocrine disease Age (range):48.5 years; gender (m/f): 10:12 comorbidities: not stated; IV: ambient temperature; irrigation fluids: 37°C; or temperature: 20°C; lungs ventilated via a semi closed circle system, 2l/min of fresh gas flow to maintain end-tidal pCO ₂ at 30-35mmHg. Inspiratory gases not warmed; opioids not administered during recovery from anaesthesia	1) Elecontrol group warming blanket (cm-an 220, chromex; 120 cm wide (active warming device; duration: positioned as soon as patients lay on or table; 42-43°C; n=11 2) usual care; duration: not stated; n=11
Camus 1993b Trial held in France	Inclusion: surgery lasting 2 hr; none were obese, febrile, or had a history of endocrine disease Age (range):48.5 years; gender (m/f): not stated comorbidities: not stated; IV: ambient temperature; irrigation fluids: 37°C; or temperature: 21.5°C; lungs ventilated via a semi closed circle system, 2l/min of fresh gas flow to maintain end-tidal pCO ₂ at 30-35mmhg. inspiratory gases not warmed; opioids not administered during recovery from anaesthesia	1) 1 insulated lower body forced-air blower cover (Bair hugger model 200, augustine medical + 2 cotton sheets (active warming device; duration: not stated; 43°C; n=11 2) usual care; duration: not stated; n=11) 3) Lower body forced air blower (Bair hugger model 200, augustine medical); 43°C
Camus 1993b2 Trial held in France	Inclusion: surgery lasting 2 hr; none were obese, febrile, or had a history of endocrine disease Age (range):48.5 years; gender (m/f): not stated comorbidities: not stated; IV ambient temperature; irrigation fluids: 37°C; or temperature: 21.5°C; lungs ventilated via a semi closed circle system, 2l/min of fresh gas flow to maintain end-tidal pCO ₂ at 30-35mm Hg. Inspiratory gases not warmed; opioids not administered during recovery from anaesthesia	1) 1 lower body forced-air blower cover (Bair hugger model 200, augustine medical + 2 cotton sheets (active warming device; duration: not stated; 43°C; n=11 2) usual care; duration: not stated; n=11 3) Lower body forced air blower (Bair hugger model 200, augustine medical); 43°C

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Camus 1997 Trial held in France</p>	<p>Inclusion: non-haemorrhagic abdominal surgery in the supine position; at least 2hrs Age (range):50 (24-65) years; gender (m/f): not stated comorbidities: not stated; or temperature: 20.5°C (SD 0.1); lower body FAW (Bair hugger model 500e)set high(43°C) applied to control group (n=3/8) when temperature decreased < 35°C; IV fluids: RT; mean IV fluids: 1.7(SD 0.1); no postoperative thermal skin lesions were detected</p>	<ol style="list-style-type: none"> 1) 2 electric group blankets (ElectroConcept); model cb2 (covered leg. To pubis); model cb3 (over head, trunk and arms) + single cotton sheeting between skin and blanket (active warming device); duration: blanket 1: once on or table; blanket2: after tracheal intubation; 40°C; n=10 2) Usual care; duration: not stated; n=8
<p>Casati 1999 Trial held in Italy</p>	<p>Inclusion: patients undergoing total hip astroplasty Exclusion: patients with severe CV and respiratory disease, obese, thyroid disease, dysautonomi or Raynaud's syndrome Age (range):68 years (SD 11): 66 (SD 7); gender (m/f): not stated; Duration of surgery: 100 min (SD 37): 105 (SD 18); comorbidities: not stated; 3 ml of Ringer's solution infused every 1ml of blood loss; all patients were in supine position; autologus blood warmed to 37°C before infusion</p>	<ol style="list-style-type: none"> 1) Forced air warming (Bair Hugger) + IV Ringer's solution (37°C) (active warming device); duration: after loss of sensation at t10 until end of surgery; not stated; n=25 2) Reflective blankets (thermal insulation); duration: after loss of sensation at t10 until end of surgery; n=25

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Dyer 1986 Trial held in Australia</p>	<p>Inclusion: transurethral resection of prostate under spinal anaesthesia Age (range):69 years; gender (m/f): 100:0 comorbidities: not stated; theatre temperature: 20.7-21.3; resection time: w: 25.4min(SD 10.8)vs c: 32.4(SD 15.4)</p>	<p>1) Reflective blanket (thermal insulation); duration: not stated; n=24 2) usual care; duration: not stated; n=25</p>
<p>Erickson 1991 Trial held in USA</p>	<p>Inclusion: at least 21y age major nonvascular abdominal Exclusion: preoperative fever (oral temperature > 37.8°C); personal or family history of malignant hyperthermia, limb amputation, or pregnancy; unable to give informed consent; spinal or epidural anaesthesia; lithotomy position Age (range):51.6 (25-80); gender (m/f): 11:49 comorbidities: not stated; in this part of the study: 6:24 (m:f); type of surgery: upper abdominal gastrointestinal surgery (cholecystectomy, colon resection, gastrectomy, exploratory laparotomy=33); lower abdominal gynaecologic procedures (abdominal hysterectomy, oophorectomy; n=27</p>	<p>1) Thermadrape head and body cover + warmed blankets; n=15) (thermal insulation); duration: not stated; n=15 2) Thermadrape body cover + warmed blankets; n=3/15) usual care; duration: not stated; n=15 3) Head and body covers 4 body covers only</p>

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Frank 1995 Trial held in USA	<p>Inclusion: patients age > 60 years; scheduled for lower vascular, abdominal or thoracic procedures; presence of 2 or more risk factors for CAD</p> <p>Exclusion: patients with ECG abnormalities, preoperative temperature < 36°C or > 38°C; history of Raynaud's or thyroid disease</p> <p>Age (range):71 (SEM 1); gender (m/f): 85:82</p> <p>comorbidities: not stated; room temperature: 21°C; endotracheal tube removed at end of surgery unless standard extubation criteria not met; in PACU for the control group: warmed blankets placed over patients at nurse's discretion; FAW group: intervention continued for 2 hr and similar to control group</p>	<ol style="list-style-type: none"> 1) Forced-air warming cover (Mallinckrodt Medical) + IV fluid and blood warmed (model bw-5) + HME (thermovent) (active patients + active fl); duration: not stated; set at height and adjusted to maintain core temp at 37°C; n=37 2) Warmed IV fluids (usual care+ active fl); duration: not stated; n=37
Frank 1997 Trial held in USA	<p>Inclusion: patients age > 60 years; scheduled for peripheral vascular, abdominal or thoracic procedures; scheduled for postoperative admission to the ICU; documented or at high risk of CAD (age criterion to preselect patients at risk for both perioperative CV complications and inadvertent hypothermia)</p> <p>Exclusion: patients with ecg abnormalities, preoperative temperature < 36°C or > 38°C; patients with Raynaud's or thyroid disease</p> <p>Age (range):71; gender (m/f): 85:82</p> <p>comorbidities: not stated; room temperature: 21°C; endotracheal tube removed at end of surgery unless standard extubation criteria not met; surgery duration 3.4 and 3.6h (SEM 1.1)</p>	<ol style="list-style-type: none"> 1) Forced-air warming cover (Mallinckrodt Medical) + IV fluid and blood warmed (model bw-5) + HME (thermovent) (active patients + active fl); duration: not stated; set to maintain core temp at 37°C; n=142 2) 1 layer of paper of surgical field+ IV fluid and blood warmed + heat moisture exchanger (usual care+ active fl); duration: not stated; n=158

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Harper 2007 Trial held in UK</p>	<p>Inclusion: non-emergency vascular, general, breast and gynaecological surgery. Age (range):58 years; gender (m/f): not stated. Comorbidities: not stated; all patients received warmed IV fluids</p>	<ol style="list-style-type: none"> 1) Bair hugger (Actamed) (active warming device); duration: not stated; set at maximum; n=19 2) Full length electric warming mattress (Inditherm) (active warming device); duration: not stated; 37°C; n=21
<p>Hindsholm 1992 Trial held in Denmark</p>	<p>Surgery: total hip arthroplasty for osteoarthritis Age (range):43-82; gender (m/f): 17:13 comorbidities: not stated; ambient or temperature: 21°C with air renewal 20 times per hour; Blood and IV fluid infusions heated to 37°C; Number randomised to each group not given; assuming 15 patients in each group</p>	<ol style="list-style-type: none"> 1) Reflective blanket (Sunflex aluminised plastic sheetings) + cotton gown + standard or draping (thermal insulation); duration: from the anaesthetic room; n=15 2) Cotton gown+ standard or draping (3 weave cotton blankets) usual care; duration: not stated; n=15

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Hofer 2005 Trial held in Switzerland</p>	<p>Inclusion: Patients undergoing elective multiple off-pump coronary artery bypass grafting, with preserved left ventricular function (ejection fraction >40%), absence of platelet glycoprotein inhibitor therapy, preoperative hematocrit 30% or higher, preoperative normothermia and no pre-existing coagulation disorders. Age: 66.3 years (SD 10.9): 64.4 (SD 10.7): 65.6 (SD 11.8); gender (m/f): 72:18; All patients received warmed transfusions (40°C); Duration of surgery: 232 min (SD 65): 248 (SD 46): 249 (SD 68)</p>	<ol style="list-style-type: none"> 1) Forced air warming (Warm Touch; Mallinckrodt Inc); (active warming device); duration:after induction of anaesthesia; 42°C; n=29 2) Electric blanket (Thermamed SmartCare OP; (active warming device) system); duration:after induction of anaesthesia;42°C; n=30 3) Water garment (Allon 2001 system; MTRE); (active warming device); duration:after induction of anaesthesia; 36.7°C; n=29
<p>Hoyt 1993 Trial held in USA</p>	<p>Inclusion: at least 18 years old, intubated and mechanically ventilated, anaesthesia gas flow maintained at no greater than 3l after induction and having a blanket warmer, fluid warmer and humid vent. Exclusion: preoperative temperature > 38°C and those receiving progesterone or testosterone. Age (range):47.5 years; gender (m/f): not stated. Comorbidities: not stated; temperature of IV fluids and blanket warmers not stated</p>	<ol style="list-style-type: none"> 1) Insulated head cover (Thermadrape) (thermal insulation); duration: applied upon arrival into or; n=13 2) Paper head cover (Kimberly-Clark) usual care; duration: not stated; n=17

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Hynson 1992 Trial held in USA</p>	<p>Included: kidney transplant patients with history of insulin-dependent diabetes, CV disease, hypertension or medication history Exclusion: obesity (150% of ideal body weight), peripheral vascular disease, limb amputation or preoperative infection or fever Age (range):not stated; gender (m/f): 4:6 comorbidities: not stated; IV fluids: warmed to 37°C; ambient room temperature: 20°C; gas flow maintained at 5l/min; ventilation was controlled to maintain end tidal PetCO₂ near 35mm Hg</p>	<ol style="list-style-type: none"> 1) Full length circulating water blanket (Blanketrol 200) covered by single layer cotton sheet (active warming device); duration: 180 min; 40°C; n=5 2) Standard surgical draping usual care; duration: not stated; n=5 3) Forced air warming (bair hugger) set at 43°C; lower-body warming blanket placed over the legs to the mid-thigh.; n=5 4) Inspired gas set at 40°C; n=5
<p>Janicki 2001 Trial held in USA</p>	<p>Patients undergoing open abdominal surgery; Exclusion: pregnant, current fever (core temperature > 38°C), septic condition within 3 days before the study, burn or multiple traumatic injuries, abdominal procedures involving rectal manipulation and surgery in lithotomy position Age (range):54.5 years (37.9-67.9); gender (m/f): 29:24 comorbidities: not stated; ASA: II-IV; ambient or temperature: 20.4°C; water garment group: lower and upper extremities, upper anterior, lateral portions of the chest and entire back of the patients whose temperature decreased to less than 34.5°C the room was warmed to 24°C to assist with patient rewarming; ambient temperature in PACU not controlled</p>	<ol style="list-style-type: none"> 1) Water-garment warmer (Allon, MTRE, advanced technologies) (active warming device); duration: before induction; 36.8°C; n=25 2) Bair hugger warming (model 505) and bair-hugger upper body warming blanket (model 52(active warming device); duration: not stated; 43°C; reduced to 'medium': 36°C if patient core temperature > 37°C; n=28

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Janicki 2002 Trial held in USA</p>	<p>Patients undergoing liver transplantation. Exclusion: pregnant, current fever (core temperature > 38°C), septic condition within 3 days before the study, burn or multiple traumatic injuries, abdominal procedures involving rectal manipulation and surgery in lithotomy position. Age (range): 50(18-65); gender (m/f): 12:12 comorbidities: not stated; ASA: II-IV; ambient OR temperature: 20.4°C; water garment group: lower and upper extremities, upper anterior, lateral portions of the chest and entire back of the patients whose temperature was less than 34.5°C; room warmed to 24°C to assist with patient rewarming; ambient temperature in PACU not controlled</p>	<ol style="list-style-type: none"> 1) Water-garment warmer (Allon, MTRE, advanced technologies) (active warming device); duration: before induction; 36.8°C; n=12 2) Bair Hugger warming (Model 505) and Bair Hugger upper body warming blanket (model 52(active warming device); duration: not stated; 43°C; reduced to 'medium': 36°C if patient core temperature > 37°C; n=12
<p>Joachimsson 1987 Trial held in Sweden</p>	<p>Inclusion: patients undergoing gastric, small and larger intestine or gall bladder operations. Exclusion: criteria not stated. Age (range):56; gender (m/f): 37:31. Comorbidities: not stated; infused blood and colloids passed through blood warmers at 37-38°C; relative humidity: 40-50%; or temperature: 22°C</p>	<ol style="list-style-type: none"> 1) Hot-water mattress (Heto, Bikerod) (active warming device); duration: not stated; 39°C; n=21 2) usual care; duration: not stated; n=24 3) Heated-humidifier; 38°C

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Johansson 1999 Trial held in Sweden	Inclusion: elective total unilateral primary hip arthroplasty, no pathologic fracture, no anamnestic evidence of coagulopathy, and prothrombin and activated partial thrombin time within normal limits. Age (range):69 (SD 7): 67 (SD 7); gender (m/f): 21:29; comorbidities: not stated; Duration of surgery: 102 min (SD 20): 100 min (SD 23); Premedication: diazepam, 5 mg by mouth used for sedation; ephedrine (5(7.6) v 4.3(6) mg); midazolam IV (2(1.8) v 1.3(1.5)mg); NSAIDs/aspirin discontinued 1 wk before operation in 8 patients in each group; fl and blood warmed; or temperature: 20.9°C	<ol style="list-style-type: none">1) Bair hugger (Augustine Medical) + pre-warmed gel-filled mattress + warmed fluids (active patients + active pt); duration: not stated; n=252) Usual care + pre-warmed gel-filled mattress + warmed fluids (active warming device); duration: not stated; n=25

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Kabbara 2002 Trial held in USA</p>	<p>Inclusion: gynaecologic, orthopaedic, otolaryngologic, plastic or general lasting 20 min or more Exclusion: emergency surgery, pregnant, heat injury, preoperative sublingual temperature < 35.5°C or > 38°C, planned ICU administrated postoperative, use of calcium channel blocker, and history of malignant hyperthermia Age (range):43.5 years; gender (m/f): 26:57 Comorbidities: not stated; ward temperature. Exclusion: 21°C; fluids at rt where clinically indicated; fresh gas flow of 2l/min</p>	<ol style="list-style-type: none"> 1) Bair Hugger (Augustine Medical) (active warming device); duration: intraoperative period; 43°C; n=45 2) Standard hospital blankets usual care; duration: not stated; n=42
<p>Kamitini 1999 Trial held in Japan</p>	<p>Inclusion: ASA I-III elective abdominal sugary Exclusion: preoperative fever or who received a vasodilator on day surgery Age (range):66; gender (m/f): not stated</p>	<ol style="list-style-type: none"> 1) Reflective sheets (thermal insulation); duration: not stated; n=22 2) Reflective sheets (thermal insulation); duration: not stated; only the extremities and trunk; n=22
<p>Kurz 1995 Trial held in USA</p>	<p>Inclusion: ASA I-III patients undergoing colon surgery; none of the patients had a history of thyroid disease, dysautonomia, Raynaud's syndrome or malignant hyperthermia Age (range):58(18-80 years); gender (m/f): 108:92 comorbidities: not stated; room temperature: 21-22°C intraoperative; 23-25°C postoperative; if patient core temperature approached 34°C, FAW was instituted to prevent further hypothermia</p>	<ol style="list-style-type: none"> 1) Forced air cover (Augustine Medical) + warmed IV fluids (active warming device); duration: not stated; 40°C; n=39 2) IV fluids - not warmed usual care; duration: not stated; not stated; n=35

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Kurz 1996 Trial held in USA	<p>Inclusion: colorectal resection for cancer or IBD; surgery duration 3.1 h (SD 1.0)</p> <p>Exclusion: patients scheduled for minor colon surgery, use of corticosteroids or other immunosuppressive drugs including cancer chemo 4 weeks before surgery; recent history of fever, infection or both; serious malnutrition or bowel obstruction</p> <p>Age (range):60 years (18-80); gender (m/f): 108:92 comorbidities: not stated; inflammatory bowel disease; mechanical bowel prep night before surgery</p>	<ol style="list-style-type: none"> 1) Forced air cover (Augustine Medical) + warmed IV fluids (fluid warmer)-activated (active warming device); duration: not stated; 40°C; n=104 2) Forced air cover (Augustine Medical) + warmed IV fluids (fluid warmer)- not activated (active + passive); duration: not stated; 'ambient temperature'; n=96
Kurz 1993a Trial held in Austria	<p>Inclusion: patients undergoing maxillofacial surgery, including node resection and flap reconstruction; none of the patients had history of fever, thyroid disease, dysautonomia, Raynaud's syndrome or malignant hyperthermia.</p> <p>Age (range):58 years; gender (m/f): not stated comorbidities: not stated; or temperature: 21°C; anaesthetic gases: via circle system using fresh gas flow of 6l/min; fluids administered intravenously warmed to 37°C; type of surgery: maxillofacial; reports no significantly different in m:f but numbers not given</p>	<ol style="list-style-type: none"> 1) Convective warming (Bair Hugger, model 500; augustine medical) (active warming device); duration: after induction of anaesthesia; 40°C (high); n=8 2) Full-length circulating water mattress (Aquamatic module, Hamilton Inc) (active warming device); duration: after induction of anaesthesia; 40°C; n=8
Kurz 1993b Trial held in Austria	<p>Inclusion: patients undergoing total hip arthroplasty or femoral resection for tumour in supine position; none of the patients had history of fever, thyroid disease, dysautonomia, Raynaud's syndrome or malignant hyperthermia.</p> <p>Age (range):58 years; gender (m/f): not stated; comorbidities: not stated; or temperature: 21°C; anaesthetic gases: via circle system using fresh gas flow of 6l/min; fluids administered intravenously warmed to 37°C</p>	<ol style="list-style-type: none"> 1) Convective warming (Bair Hugger, model 500; augustine medical) (active warming device); duration: after induction of anaesthesia; 40°C (high); n=8 2) Full-length circulating water mattress (Aquamatic module, Hamilton Inc) (active warming device); duration: after induction of anaesthesia until not stated; 40°C; n=8

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Lenhardt 1997 Trial held in USA</p>	<p>Inclusion: patients aged 18-80 years undergoing abdominal surgery (colon resection with or without abdominal peritoneal pull stable, systemic disease); ASA I-III; Exclusion: patients scheduled for minor abdominal surgery; Duration of surgery: 3.4 hours (SD 1.2): 3.2 (SD 1.1) Age (range):56 (SD 17): 55 (SD 16); gender (m/f): 74:76 Comorbidities: not stated; 100 of the patients participated in kurz 1996</p>	<ol style="list-style-type: none"> 1) Extra warming (active warming device); duration: not stated; core temperature maintained near 36.5°C; n=74 2) usual care; duration: not stated; n=76
<p>Leung 2007 Trial held in Hong Kong , People's Republic of China</p>	<p>Inclusion: age 18-80 years, ASA I-III and elective laparotomy Exclusion: pregnancy, core temp $\geq 37.5^{\circ}\text{C}$ Age (range):65 years; gender (m/f): 39:21 comorbidities: not stated;</p>	<ol style="list-style-type: none"> 1) Upper body forced-air warming (Bair Hugger, augustine medical) (active warming device); duration: after induction until end of surgery; 43°C; n=30 2) Elecontrol group heating pad (Operatherm 20+ prewarmed gel pad (active warming device); duration: not stated; 39°C; n=30
<p>Lindwall 1998 Trial held in Sweden</p>	<p>Inclusion: ASA I-IV patients for extensive operations for oesophageal, rectal or bladder carcinoma with duration of surgery and anaesthesia greater than 3hours; exclusion criteria not stated Age (range):65.5 years; gender (m/f): not stated comorbidities: not stated; active fluid warming in both groups (38-39°C); low flow anaesthesia with fresh gas flow of 0.7-1.2 l/min</p>	<ol style="list-style-type: none"> 1) Upper or lower forced air [Bair Hugger (Model 500) (Augustine Medical)] (active patients + active fl); duration: started before induction of anaesthesia and stopped at end of operation; 43°C (SD 2.3); n=12 2) Double layers of terry cloth + operation drapes usual care; duration: not stated; n=13

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Study	Participants	Interventions
Mason 1998 Trial held in USA	<p>Inclusion: Roux-en-y gastric bypass surgery for morbid obesity Exclusion criteria not stated Age (range): 38.5 (SD 6.1): 40.7 (SD9.6); (17-59 years); gender (m/f): 9:55; Duration of surgery: 156.1 min (SD 27.4): 156.9 (SD 31.6)comorbidities: not stated; or temperature: 20.9°C; PACU temperature: 24.75°C *significantly different between the groups length of incision (cm). Length of incision longer in warmed blanket group</p>	<ol style="list-style-type: none"> 1) Forced air warming [Bair Hugger (Model 500 Augustine Medical)] (active warming device); duration: not stated; 'medium'= 38°C (SD 3); n=32 2) Warmed cotton blankets (active warming device); duration: not stated; n=32
Matsukawa 1994 Trial held in Japan	<p>Inclusion: abdominal surgery (subtotal gastrectomy, total gastrectomy, or cholecystectomy) scheduled to last at least 2h Exclusion criteria not stated Age (range):61.5; gender (m/f): 27:13 comorbidities: not stated; or temperature: 24-26°C; Ringer's lactate solution administered to all patients</p>	<ol style="list-style-type: none"> 1) Forced air warming (Bair Hugger) + circulating blanket warming (KR-thermia RK600) (active patients + active pt); duration: unclear; 38°C (FAW) + 37°C (circulating blanket); n=20 2) Circulating blanket warming (KR-Thermia RK600) (active warming device); duration: unclear; 37°C; n=20
Matsuzaki 2003 Trial held in Japan	<p>Exclusion: patients with preoperative fever, evidence of current infection, thyroid disease or disturbance of autonomic function Age (range): 55 years (20-80); gender (m/f): 15:9 comorbidities: not stated;</p>	<ol style="list-style-type: none"> 1) Upper body forced air over (Warm touch; Tyco-Mallinckrodt) (active warming device); duration: after induction of GA and maintained through surgery; set to medium; n=8 2) Full length circulating water mattress (active warming device); duration: after induction of GA and maintained through surgery; set to medium (38°C); n=8 3) Carbon-fibre resistive heating blanket (SmartCare OP); duration:after induction of GA and maintained through surgery;set to medium (38°C); n=8

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Mogera 1997 Trial held in India	<p>Inclusion: intracranial surgery lasting at least 4 hours Exclusion: obese, febrile, or had a history of endocrine diseases Age (range):47 years; gender (m/f): 18:12 comorbidities: not stated; IV fluids- ambient temperature</p>	<ol style="list-style-type: none"> 1) Convective warm air blanket (Bair Hugger, Augustine) (active warming device); duration: not stated; n=15 2) Cotton sheet (usual care); duration: not stated; n=12
Motamed 2000 Trial held in France	<p>Inclusion: long-lasting abdominal surgery Exclusion: history of renal, hepatic or neuromuscular disease and taking medications known to interfere with neuromuscular function, e.g. Patients with electrolyte abnormality, diabetes and those with an anticipated difficult airway; patients with drawn if surgery < 2hr Age (range):56 years (SD 15): 50 (SD 14); gender (m/f): 17:9 comorbidities: not stated; room temperature: at 21°C</p>	<ol style="list-style-type: none"> 1) Upper FAW (Warm Touch, Mallinkrodt) (active warming device); duration: not clearly stated; 43°C; n=13 2) Lower FAW (Warm Touch, Mallinkrodt) (active warming device); duration: not clearly stated; 43°C; n=13
Muller 1995 Trial held in Austria	<p>Inclusion: orthotropic liver transplant Exclusion criteria not stated Age (range):52.5 years; gender (m/f): 15:5 Comorbidities: not stated; IV fluids warmed to 37°C</p>	<ol style="list-style-type: none"> 1) Forced air warming + circulating water mattress(full length) (American Pharmaseal Company) (active warming device); duration: not stated; 42°C; n=10 2) Circulating water mattress(full length) (American Pharmaseal Company) (active warming device); duration: not stated; n=10

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Negishi 2003 Trial held in USA</p>	<p>Inclusion: open abdominal surgery Exclusion: preoperative fever, evidence of current infection, thyroid disease or dysautonomia Age (range):62 years (20-80); gender (m/f): 15:9 comorbidities: not stated; ambient temperature: near 22°C; all fluids warmed to 37°C</p>	<ol style="list-style-type: none"> 1) Full-length circulating-water mattress (Meditherm; Gaymar Industries Inc)with 5mm pad placed between mattress and patients (thermal insulation); duration: not stated; 42°C; n=8 2) Forced-air cover (Bair Hugger) (active warming device); duration: not stated; set to high n=8 3) Restive heating blanket (Smartcare; Thermamed gmbh) set at 42°C overed one arm, the chest and both legs
<p>Ng 2006 Trial held in Hong Kong, People's Republic of China</p>	<p>Inclusion: age 18-80 years, ASA I-III and elective total knee replacement Exclusion: pregnancy, core temp \geq 37.5°C; history of heat injury; contraindication to neuraxial blockade Age (range):67; gender (m/f): 17:43</p>	<ol style="list-style-type: none"> 1) Upper body forced-air warming (Bair Hugger, Augustine Medical) (active warming device); duration: after induction until end of surgery; 43°C; n=30 2) Electric heating pad (Operatherm 20+ prewarmed gel) pad (active warming device); duration: not stated; 39°C; n=30
<p>Ouellette 1993 Trial held in USA</p>	<p>Inclusion: patients undergoing cervical or lumbar laminectomy with duration of at least 90 min Exclusion criteria not stated Age (range):44 years; gender (m/f): not stated Comorbidities: not stated; IV fluids administered at room temperature; room temperature: 20-21°C</p>	<ol style="list-style-type: none"> 1) Bair Hugger forced air warming (active warming device); duration: not stated; set on 'low'; n=12 2) usual care; duration: not stated; n=not stated 3) Reflective blanket over upper and lower extremities; n=12; inspired, heated, humidified air (Maquest sct 2000) at 39°C; n=12

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Radel 1986 Trial held in USA</p>	<p>Inclusion: orthopaedic surgery on lower extremities of 1 hour duration or greater. Patients selected had no skin lesions or burns of chest, back or scalp; no pre-existing medical conditions precluding use of rectal and oesophageal probes; oral temperature < 38°C or less than 1 hour prior to induction Age (range):23-92 years; gender (m/f): 30:0 Comorbidities: not stated</p>	<ol style="list-style-type: none"> 1) Circulating water vest and cap (Gaymar Meditherm) + IV fluids (active warming device); duration: not stated; water fluid at a temperature of 38°C; IV fluids: 37°C; n=10 2) 2 cotton sheets and patient gown+ IV fluids usual care; duration: not stated; warmed IV fluids: 37°C; n=10 3) Insulated usual care; 2 cotton blankets and shirts and a cotton skull cap; n=10
<p>Radford 1979 Trial held in UK</p>	<p>Inclusion: patients undergoing craniotomy for intracranial tumours or aneurysms in supine position Exclusion: patients younger than 14 years and those with pyrexia before operation Age (range):48.5; gender (m/f): 22:20 comorbidities: not stated; significantly different in baseline core temperature. Anaesthetic gases not warmed or humidified; infused blood (rarely given)not warmed; or other infusions not warmed; theatre temperature (start of operation): 22.2°C; end of operation: 23.7°C</p>	<ol style="list-style-type: none"> 1) Metallized plastic sheet (thermal insulation); duration: not stated; n=20 2) Cotton gown and 1 cotton blanket usual care; duration: not stated; n=22

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Rasmussen 1998 Trial held in Denmark</p>	<p>Inclusion: colonic resections or rectal amputations lasting at least 2 hours Exclusion: fever, metabolic disorder, BMI > 30 kg/m², ongoing treatment with β-blocking agents or neuromuscular disease Age (range):67(49-80 years); gender (m/f): 10:14 comorbidities: not stated; fresh gas flow: 1.5-3.0 l/min into a semi closed circle system with CO₂ absorption IV fluid: room temperature; blood humidity, blood transfusion: 37°C through heating device; room temperature: 21°C</p>	<ol style="list-style-type: none"> 1) Bair Hugger (Augustine Medical) + prewarmed gel mattress (active patients + active pt); duration: from the or; unclear when warming ceased; BH: 43°C; gel mattress: 40°C; n=8 2) Prewarmed gel mattress (active warming device); duration: from the or rm; unclear when warming ceased; 40°C; n=8 3) 8 patients randomised to oesophageal heat exchanger. [GDG agreed this is not common practise within the UK]
<p>Russell 1995 Trial held in UK</p>	<p>Exclusion: patients with fulminant liver disease; history of previous upper abdominal surgery Age (range):45.8 years; gender (m/f): 29:31 comorbidities: not stated; ward temperature: not stated; irrigation and IV fluid: warmed to 37°C; anaesthetic gases: admin via a circle breathing system with fresh gas flow of 3 l/min</p>	<ol style="list-style-type: none"> 1) FAW under mattress (Howarth) + warmed IV and irrig fluid (37°C) (active warming device); duration: not stated; 40°C; n=20 2) Electric under blankets (JMW medical) + warmed IV and irrig fluid (37°C) (active warming device); duration: not stated; 39°C; 41°C; n=20 3) FAW over blanket (Mallinkrodt); set to high (42-48°C) resets to medium (36-41.5°C) after 45 min

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Scott 2001 Trial held in UK</p>	<p>Inclusion: Patients over 40 years undergoing orthopaedic, colorectal, gastrointestinal, urological and vascular surgery; ASA I-IV; undergoing major surgery with an expected hospital stay of 5 days; no existing sacral pressure ulcers and provided informed consent Exclusion: patients undergoing procedures in which intraoperative warming standard practice; lateral or prone position Age (range):68.4 years (SD 9.1): 68.2 (SD 9.2) (41-89); gender (m/f): 149:175; Duration of surgery: 111 min (SD 47.4): 115.5 (SD 46.8); comorbidities: not stated; 27 protocol violations; 17 patients allocated to warming treated as usual care and 10 patients assigned to usual care given warming because of clinical need; some control patients may have received warmed IV fluids</p>	<ol style="list-style-type: none"> 1) Forced air warming + warmed IV fluids (active warming device); duration: not stated; n=161 2) Usual care + warmed IV infusions, as determined by clinical need.usual care; duration: not stated; n=163
<p>Sheng 2003 Trial held in USA</p>	<p>Exclusion: use of corticosteroids or immunosuppressive drugs (including cancer chemotherapy) 4 weeks prior to surgery, recent history of fever, infection or both; serious malnutrition (low serum albumin, a low wbc or loss of more than 20 % of body weight) Age (range):37.5 years; gender (m/f): 23:30 comorbidities: not stated; outpatient setting surgery; holding room temperature: not stated; or temperature: 21°C; IV fluid: room temperature; ASA: I-III</p>	<ol style="list-style-type: none"> 1) Reflective blanket (thermal insulation); duration: on arrival into outpatient clinic till prior to transfer to or; n=30 2) Usual care;duration: not stated; n=23

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Study	Participants	Interventions
Sheng 2003 (1b) Trial held in USA	<p>Inclusion: ASA I-III Exclusion: use of corticosteroids or immunosuppressive drugs (including cancer chemotherapy) 4 weeks prior to surgery, recent history of fever, infection or both; serious malnutrition (low serum albumin, a low wbc or loss of more than 20 % of body weight) Age (range):37.5 years; gender (m/f): 23:30 comorbidities: not stated; outpatient setting surgery; holding room temperature: not stated; or temperature: 21°C; IV fluid: room temperature</p>	<p>1) Reflective blanket(Thermo-lite) (thermal insulation); duration: on arrival to or; n=26 2) Cloth blanket usual care;duration: not stated; n=26 Patients randomised to hat/jackets in the preoperative phase</p>
Smith 1994 Trial held in USA	<p>Inclusion: outpatients scheduled for arthroscopic knee surgery Exclusion criteria not stated Age (range):35 years (SEM 1.5): 34 (SEM 1.9); gender (m/f): 79:48; Duration of surgery: 56 min (SEM 1.9): 53 (SEM 2.6) comorbidities: not stated;</p>	<p>1) Forced air cover (Bair Hugger, model 500; Augustine Medical) + warmed cotton blankets (active warming device); duration: not stated; n=31 2) Warmed cotton blankets usual care; duration: not stated; 60°C; n=21; warming continued in PACU; smith 1994a: patients not warmed in PACU</p>
Smith 1994a Trial held in USA	<p>Inclusion: outpatients scheduled for arthroscopic knee surgery Exclusion criteria not stated Age (range):34.5 years; gender (m/f): 79:48 comorbidities: not stated; Patients not warmed in PACU</p>	<p>1) Forced air cover (Bair Hugger, model 500; Augustine Medical) + warmed cotton blankets (active warming device); duration: not stated; n=38 2) Warmed cotton blankets usual care; duration: not stated; 60°C; n=37;</p>

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Study	Participants	Interventions
Tølløfsrud 1984a Trial held in Norway	Inclusion: 40 patients scheduled for surgery on the abdominal aorta (straight or bifurcated prosthesis) Exclusion: patients with body temperature of over 37.5°C or under 36.5°C on the morning of surgery Age (range):64; gender (m/f): 8:2 comorbidities: not stated; blood and plasma warmed to 37°C	<ol style="list-style-type: none"> 1) Warming blanket(Gorman Rupp); 45x60cm (active warming device); duration: not stated; 38-40°C; n=10 2) Usual care usual care; duration: not stated; n=10 3) Warming blanket + heated humidifier; n=10 4) Heated-humidifier(Bennett cascade humidifier) 37-40°C; n=10
Tølløfsrud 1984b Trial held in Norway	Inclusion: 40 patients scheduled for extra-abdominal vascular surgery (femoropopliteal bypass and profunda plasty) Exclusion: patients with body temperature of over 37.5°C or under 36.5°C on the morning of surgery Age (range):70; gender (m/f): 8:2 Comorbidities: not stated; blood and plasma warmed to 37°C	<ol style="list-style-type: none"> 1) Warming blanket(Gorman Rupp); 45x60cm (active warming device); duration: not stated; 38-40°C; n=10 2) Usual care usual care; duration: not stated; n=10 3) Warming blanket + heated humidifier; n=10 4) Heated-humidifier (Bennett cascade humidifier) 37-40°C; n=10
Torrie 2005 Trial held in New Zealand	Inclusion: males ASA I-III scheduled for TURP Exclusion: age less than 55 or greater than 90years; thyroid dysfunction; weight less than 50kg or greater than 120kg; ASA > III; indwelling urinary catheter or urinary tract infection; core temperature \geq 37.5°C Age (range):72.5 years; gender (m/f): 60:0 Comorbidities: not stated;	<ol style="list-style-type: none"> 1) Forced air warming (Bair Hugger, Augustine Medical) + warmed iv(hotline)+warmed irrigation fluid(warming cabinet) (active warming device); duration: not stated; FAW: 43°C; IV: 41°C; irrigation: 42°C; n=32 2) Radiant warming (Sun Touch) + warmed IV fluids(Hotline) + warmed irrigation fluids (warming cabinet) (active warming device); duration: not stated; radiant: 41°C; IV: 41°C; irrigation: 42°C; n=28

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Study	Participants	Interventions
Whitney 1990 Trial held in USA	Inclusion: intra abdominal gynaecological surgery of at least 1.5hrs Exclusion criteria not stated Age (range):40.5; gender (m/f): 0:40 comorbidities: not stated; concurrent treatments: not stated; theatre temperature:, irrigation fluid: not stated; humidity: not stated; air flow: not stated; HME utilised	1) Warmed cotton thermal blanket (active warming device); duration: prior to induction; not stated; when removed; not stated; n=20 2) Thermadrape (OR concepts); reflective blanket is an aluminium impregnated plastic material (thermal insulation); duration: prior to induction; not stated; when removed; n=20
Winkler 2000 Trial held in Austria	Inclusion: patients scheduled to undergo primary, unilateral, cement-free total hip arthroplasty. None performed for treatment of tumour Exclusion: preoperative coagulation tests abnormal, aspirin products consumed within a week of surgery, history of bleeding disorders, dvt, pulmonary embolism Age (range):64.5 (40-80)years; gender (m/f): 65:85 comorbidities: not stated; concurrent treatments, ward temperature, irrigation fluid, IV fluid, humidity, air flow	1) Forced air covers attached to individual forced air heater (Bair Hugger, Augustine Medical) (active warming device); duration: not stated; temperature adjusted to maintain core temp at 36.5°C; n=75 2) Forced air covers attached to individual forced air heater(Bair Hugger, Augustine Medical) (active warming device); duration: not stated; temperature adjusted to maintain core temp at 36.0°C; n=75

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Wong 2004 Trial held in New Zealand</p>	<p>Inclusion: 20-60 years; weight: 50-110 kg; laparoscopic cholecystectomy Exclusion: patients presenting with pre-existing hyperpyrexia, history of malignant hyperthermia, or currently taking antipyretic medication Age (range): 39.3 (26.5-50.3 years) gender (m/f): 0:42 Comorbidities: not stated; mean theatre temperature: a: 21.6°C (SD 1.1); b: 22.2°C (SD 1.2) mean theatre humidity: a: 46% (SD 4); b: 45% (SD 5). IV fluid: for all patients prewarmed to 42°C. All patients covered in thin hospital blankets covering torso, arms and legs followed by drape</p>	<ol style="list-style-type: none"> 1) Sun touch (Fisher and Paykel healthcare, NZ) (active+ thermal insulation); duration: after patients placed on operating table; temperature setting at 41°C; n=21 2) Bair Hugger (Augustine Medical, USA) (active + passive); duration: after patients placed on operating table; temperature setting at 43°C; n=21
<p>Yamakage 1995 Trial held in Japan</p>	<p>Inclusion: spinal anaesthesia for surgery on the lower abdomen or a lower extremity Exclusion: patients with history of smoking or extreme obesity (BMI > 30 kg/m²) Age (range): 56.2 years (45-72); gender (m/f): 6:8 comorbidities: not stated; IV: 37°C; OR temperature: 23°C</p>	<ol style="list-style-type: none"> 1) Forced air warming (Bair Hugger) + warmed IV fluids (active warming device); duration: 90 min; set to 'medium'- 37°C; n=7 2) Cloth blanket + warmed IV fluids usual care; duration: not stated; n=7 3) Bair Hugger (lower body); [below T10]; n=7

C7: PRE AND INTRA OPERATIVE WARMING DEVICES

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Bock 1998 Trial held in Germany ; Funding: not stated</p>	<p>Exclusion: patients undergoing surgery of biliary tract, liver, pancreatic, gasterctomy, or those who underwent preoperative radiotherapy or from recurrent rectal cancer; patients with temperature <36.5°C or >37.5°C on arrival in preoperative holding area</p> <p>Perioperative phase: pre and intra; surgery type: not stated; surgical speciality: abdominal; surgery duration: over 3 h; anaesthesia type: General; anaesthesia duration more than 1h; premed: midazolam(7.5mg) 10min before arrival in holding area; all patients ASA grade: mixed;</p> <p>Age (range): 46(19-78 years); gender (m/f): 21: 19; BMI: Not stated</p> <p>comorbidities: not stated; fluids-warmed; gas flow at 3l/min;ambient room temperature: 22°C during preinduction and anaesthesia; included: ASA 1-III undergoing major abdominal surgery for cancer or inflammatory bowel disease; no patients showed signs of bowel obstruction or acute onset of ibd</p>	<ol style="list-style-type: none"> 1) Warm touch (mallinckrodt medical gmbh) and (circulating water mattress and blankets and fluid warming devices (active patients and active fluids); duration: not stated; 40-42°C; water mattress: 39°C; intervention. Body area covered: arms and chest using forced air; abdomen and legs-blankets; proportion covered ≥ 50%; treated; n=20 2) Circulating water mattress and blankets and fluid warming devices (active patients and active fluids); duration: not stated; water mattress: 39°C ontrol body area covered: abdomen and legs/two blankets; arms and chest covered with blankets; proportion covered ≥ 50% treated; n=20

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Buggy 1994 Trial held in Ireland; Funding: not stated</p>	<p>Inclusion: surgery: orthopaedic and plastic surgery on the limbs</p> <p>Exclusion: patients <14 years or >80 year, with pyrexial illness, those who required mechanical ventilation or who required intraoperative blood transfusions</p> <p>Perioperative phase: pre and intra; surgery type: elective; surgical speciality: mixed; surgery duration: 30 to 60 min; anaesthesia type: general; anaesthesia duration 30 to 60 min; premed: all patients-oral temazepam or diazepam 10 mg; ASA grade: I-II</p> <p>Age (range): 35 (14-79 years); gender (m/f): 48: 20; BMI: not stated</p> <p>Comorbidities: not stated; theatre temperature 21-22°C; no patients received IV fluids; humidity-59-61%; air flow maintained constant; closed circle breathing system (Drager, Narkomed) fresh gas flow 1) 5 l/min; active humidification not used.</p>	<ol style="list-style-type: none"> 1) Space blanket (UN320) placed next to the cotton gown and inside all surgical drapes. (thermal insulation); duration: from before induction to transfer to recovery room; amount; intervention body area covered: at least 60%; proportion covered \geq 50% treated; n=34 2) Standard surgical draping (similar to intervention) usual care; control body area covered; proportion covered; n=34

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Horn 2002 Trial held in USA; Funding: not stated</p>	<p>Inclusion: Cesarean delivery. Indication for caesarean including prior caesarean and breech; none were in labour</p> <p>Exclusion: <18 years, diagnosis of preeclampsia or eclampsia, history or clinical evidence of a clotting disorder. Patients taking any chronic medications (except patients perinatal vitamins)</p> <p>Perioperative phase: pre and intra; surgery type: elective; surgical speciality: gynaecology; grade 2; surgery duration: 30 to 60 min; anaesthesia type: regional; anaesthesia duration: not stated; premed: oral ranitidine (150mg) 2h before surgery; ASA grade: not stated</p> <p>Age (range): 32 years; gender (m/f): 0: 30; BMI: not stated</p> <p>comorbidities: not stated; intraoperative ambient temperature maintained near 24°C; fluids warmed to 37°C ; patients fasted for at least 6 hours; surgery started 81min v 89 min after induction for the actively warmed and usual care group, respectively.</p>	<ol style="list-style-type: none"> 1) Bair Hugger forced-air cover (Augustine Medical) (active warming device); duration: 15 min; 43°C; intervention body area covered: 'upper body'; proportion covered not stated; n=15 2) Single cotton blanket usual care; control body area covered; proportion covered: not stated; n=15

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Smith 2007 Trial held in USA; Funding: Metro-Health Medical Center, Smiths Medical Asd inc (formerly SIMS)</p>	<p>Inclusion: gynaecological, orthopaedic, urological, general surgery scheduled >30mins</p> <p>Exclusion: <18/>85 years; abnormal bleeding; malignant Hyperthermia (or fh); pre-operation temperature >38/<35 c, chemo/major surgery last 3 mo; immuno-suppressed/steroids last 2 wk; coagulatinins/vasospasm; pregnancy</p> <p>Perioperative phase: pre and intra; surgery type: elective; surgical speciality: mixed surgery Duration: 30 to 60 min; anaesthesia type: general; anaesthesia duration more than 1h; premed: midazolam; some patients ASA grade: mixed</p> <p>Age (range): 40 years (SD 13); gender (m/f): 98: 238; BMI: not stated</p> <p>comorbidities: not stated; 6 patients in each group had diabetes; 67 and 72 were smokers; ambient temperature 21°C; temperature measures; sublingually pre-operation and postoperatively and oesophageal or nasopharyngeal intra-operatively</p>	<ol style="list-style-type: none"> 1) Snuggle warm convective warming system, sims, Irvine, Ca and warmed IV fluids (active warming device); duration: aim for 30 mins; actually 42 and/-38 min pre- and intra-op; 40°C (SD 1); intervention body area covered: 40%; proportion covered; n=156 2) Convective air warming and/or warmed IV fluids at discretion of anaesthetist usual care; duration: not stated; control body area covered; proportion covered: not stated; n=180

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Wong 1997 Trial held in UKFunding: not stated</p>	<p>Inclusion: major open abdominal surgery requiring bowel resection, with or without anastomosis; 69% had abdominal surgery for colorectal surgery, 15% inflammatory bowel disease, diverticular disease (7%), gastric carcinoma (3%), benign colonic tumour (2%) and other (5%). Similar proportion of benign and malignant diseases between the 2 groups</p> <p>Perioperative phase: pre and intra; surgery type: not stated; surgical speciality: abdominal; unclear; surgery duration: over 3 h; anaesthesia type: general; anaesthesia duration not stated; premed: not stated; ASA grade: mixed</p> <p>Age (range): 61 years; gender (m/f): 53: 50; BMI: not stated</p> <p>Comorbidities: not stated;</p> <p>Exclusion: laparoscopic procedures, use of corticosteroids or other immunosuppressive drugs (including cancer chemotherapy) 4 weeks before surgery, recent history of fever, infection or both</p>	<ol style="list-style-type: none"> 1) Warming mattress (Inditherm) (pre and intra) and forced air warming (Bair Hugger) and warmed fluids[intra only (active patients and active patients); duration: 2 hr(pre and intra); warming mattress: 40°C; forced air warming: 40°C; Intervention body area covered: patients placed on mattress; length not stated; proportion covered not atated; n=47 2) Usual care (pre and intra) and forced air warming (Bair Hugger) and warmed fluids [intra only] (active patients and active fluids); duration: n/r; FAW: 40°C body area covered: patients placed on warming mattress but not turned on; proportion covered not stated; n=56

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Wongorasartsuk 1998 Trial held in Australia; Funding: not stated</p>	<p>Exclusion: patients of ASA \geq IV; <18 or >75 years; inter-current febrile illness, temperature $>38^{\circ}\text{C}$ on arrival in OR, active thyroid disease, allergy to anaesthetic agents to be used or documented history of family history of malignant hyperthermia and emergency surgery</p> <p>Perioperative phase: pre and intra; surgery type: elective; surgical speciality: orthopaedics; grade 2; Surgery duration: 1 to 3 h; anaesthesia type: general; anaesthesia duration not stated; premed: not stated; all patients ASA grade: mixed</p> <p>Age (range): 50; gender (m/f): 14: 12; BMI: not stated;</p> <p>comorbidities: not stated; in both groups, after upper body blanket prep, rest of the body covered by 2 layers of cotton blankets prior to surgery; all IV fluids warmed via a warming coil; OR temperature: $18\text{-}19^{\circ}\text{C}$; at end of surgery, no additional warming</p>	<ol style="list-style-type: none"> 1) Forced air warming (Bair Hugger) (active warming device); duration: 30 min; not stated; intervention body area covered: upper body and limbs; proportion covered $<50\%$ treated; n=14 2) Two cotton blankets usual care; duration: 30 min; control body area covered: upper body and limbs; proportion covered $<50\%$ treated; n=12

C8: INTRAOPERATIVE PHASE: FLUID WARMING

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Camus 1996 Trial held in France Funding: not stated</p>	<p>Inclusion & exclusion criteria: major abdominal surgery lasting at least 3 hours; none of the patients were obese, febrile or had a history of endocrine disease. Surgery type: elective; surgical speciality: abdominal; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration more than 1h; premed: hydroxyzine 100 mg orally 1 h prior to surgery; no. Of intubated/ventilated patients postoperatively: not stated - ASA grade: I-II; age (range): 45; gender (m/f): 9:9; BMI: not stated comorbidities: not stated; inspired gases not warmed; IV fluids infused at a rate of 8-10 ml/kg/h through an 18g cannula; all patients warmed with electric blanket in PACU until temperature reached preinduction values; intubation of trachea pancuronium(0.1mg/kg); most patients in lithotomy position;</p>	<ol style="list-style-type: none"> 1) fluid tube-warming (Hotline; Level 1) + electric blanket (40°C) (electroconcept) (active pt + active fl); duration:; 37°C; n=9 2) room temp IV fluids + electric blanket (Electroconcept) (40°C) (active pt + active fl); duration:; amount; n=9

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Cooper 1994 Trial held in Australia Funding: not stated</p>	<p>Inclusion & exclusion criteria: routine hysteroscopic surgery for menorrhagia; Surgery type: not stated; surgical speciality: gynaecology; surgery duration: not stated Anaesthesia type: not stated/unclear; anaesthesia duration not stated; premed: majority received danazol 200mg 3 times daily for 6 weeks as an endometrial preparatory agent; stated - ASA grade: not stated; age (range): 40 years(31-49); gender (m/f): 0:14; BMI: not stated comorbidities: not stated; uterine cavity length: 6v9cm; 9 pts:total transcervical resection of the endometrium, of whom 3 had simultaneous hysteroscopic polypectomy; 4 patients underwent rollerball ablation of the endometrium; 1 patient had extensive myoma resected;</p>	<ol style="list-style-type: none"> 1) Sterile 1.5% glycine (Althin ift 220, Althin Medical ab) (active fl); duration:; 37.5°C; n=not stated 2) Usual care; duration:; 20 °C; n=not stated
<p>Dyer 1986 Trial held in Australia Funding: not stated</p>	<p>Inclusion & exclusion criteria: transurethral resection of prostate under spinal anaesthesia Surgery type: not stated; surgical speciality: urology; surgery duration: over 3 h Anaesthesia type: regional; anaesthesia duration not stated; premed: not stated; ASA grade: not stated; age (range): 69 years; gender (m/f): 100:0; BMI: not stated comorbidities: not stated; theatre temp:20.7-21.3°C; resection time: w:29.2min(SD15.7)vs c:32.4(SD15.4);</p>	<ol style="list-style-type: none"> 1) 1.5% glycine warmed (Contherm 150 incubator set (passive fl); duration: not stated; 37°C (temperature fell rapidly; mean: 33°C); n=22 2) Usual care; n=25 3) Reflective blanket 4) Reflective blanket + warmed irrigation fluid

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Ellis-Stoll 1996 Trial held in USA Funding: not stated</p>	<p>Inclusion & exclusion criteria: women scheduled for laparoscopic cholecystectomy Surgery type: not stated; surgical speciality: abdominal; surgery duration: mixed Anaesthesia type: not stated/unclear; anaesthesia duration not stated; premed: not stated; ASA grade: not stated; age (range): 43 years(26 to 64); gender (m/f): 0:50; BMI: not stated comorbidities: not stated; study did not state how many patients randomised to each group- assuming equal randomisation;all patients upper chest and arms covered with prewarmed blanket; none of the prewarmed IV fluid bag's initial temperature exceed 44°C</p>	<ol style="list-style-type: none"> 1) Actively warmed IV fluids (active fl); duration:; 37°C; n=25 2) Room temperature IV fluids; duration:; temperature dropped to rt during surgery; n=25

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Hasankhani 2005 Trial held in Iran Funding: not stated</p>	<p>Inclusion & exclusion criteria: Excl: age: <18 or >55 years preoperative use of calcium channel blockers, preoperative sublingual temp >38.°C or <35.5°C; history of endocrine disease, obesity, pregnancy, or anaemia. Surgery type: elective; surgical speciality: orthopaedics; surgery duration: 1 to 3 h; ASA: I Anaesthesia type: general; anaesthesia duration more than 1h; premed: atropine (0.2-0.4mg); no. Of intubated/ventilated patients postoperatively: not stated - ASA grade: I-II; age (range): 36 years(18-55); gender (m/f): 39:21; BMI: not stated comorbidities: not stated; during surgery all pts covered by cotton blankets & surgical drapes & covered w/cotton blanket before transport to PACU; or temp:24°C; inspired gases not warmed.; p.9-set patient temp of fluid warmer to warming IV fluids: 39.5°C at 800cc/h;</p>	<ol style="list-style-type: none"> 1) Warmed IV fluids via a dry fluid warmer (Biegler) (active fl); duration: not stated; t_{bag}:24;t_{prox}:36-38°C; distal:32-38°C; n=30 2) Room temp IV fluids usual care; duration: not stated; 24.4°C n=30
<p>Heathcote 1986 Trial held in Australia Funding: not stated</p>	<p>Inclusion & exclusion criteria: Surgery type: not stated; surgical speciality: not stated; surgery duration: not stated Anaesthesia type: regional; anaesthesia duration: not stated; premedication;; ASA grade: not stated; age (range)::; gender (m/f)::; BMI: comorbidities: not stated;</p>	<ol style="list-style-type: none"> 1) 1.5% glycine warmed (Contherm 150 incubator) set (passive fl); duration:.; 37°C(mean 33°C); n=19 2) Usual care; duration:.; amount; n=21

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Study	Participants	Interventions
Jaffe 2001 Trial held in USA Funding: not stated	<p>Inclusion & exclusion criteria: incl and excl criteria not stated</p> <p>Surgery type: not stated; surgical speciality: urology; surgery duration: 30 to 60 min</p> <p>Anaesthesia type: not stated/unclear; anaesthesia duration not stated; premed: not stated;</p> <p>ASA grade: not stated; age (range): 71.2 years (52-89); gender (m/f): 56:0; BMI: not stated</p> <p>comorbidities: not stated;</p> <p>Patients from both groups were covered with a gown and warmed blanket (45°C from neck to level of umbilicus); at end of procedure patients were covered with a new warm blanket; in PACU all patients had continuous bladder irrigation with room temperature irrigation fluid; Room temperature:21°C.</p>	<p>1) Warmed irrigation fluid (33°C); unclear actively or passively warmed (active fl); duration: not stated; 33°C; n=29</p> <p>2) Room temp irrig fluid usual care; duration:; 21°C; n=27</p>

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Study	Participants	Interventions
<p>Kelly 2000 Trial held in Phillipines/Cuba/USA Funding: not stated</p>	<p>Inclusion & exclusion criteria: i: Patients undergoing knee arthroscopy; e:<18 or >65years;presence of co-existing disease affecting patients ability to maintain normal core temp (i.e. Thyroid disease);contraindication or unwillingness to undergo spinal anaesthesia; Surgery type: not stated; surgical speciality: orthopaedics; surgery duration: mixed Anaesthesia type: regional; anaesthesia duration not stated; premed: midazolam (IV) administered to all patients just before departing the preoperative holding area; no. ASA grade: I-II; age (range): 36(20-56); gender (m/f): not stated; BMI: not stated comorbidities: not stated; Mean duration of surgery:44min (18-92);all IV fluids administered at room temperature; if external warming devices were required during surgery or recovery, patient withdrawn from study; all patients were covered with single cloth sheet before application of sterile drape</p>	<p>1) Prewarmed saline irrigation solution in a warming cabinet (passive fl); 40°C n= 12 2) Usual care; n=12</p>

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Kurz 1995 Trial held in USA Funding: Supported by NIH grant</p>	<p>Inclusion & exclusion criteria: patients undergoing colon surgery. None of the patients had a history of thyroid disease, dysautonomia, Raynaud's syndrome or malignant hyperthermia. Surgery type: elective; surgery duration: 1 to 3 h; Anaesthesia type: general; anaesthesia duration: not stated; premed: Oral diazepam (10 mg); no; ASA grade: I-III; age (range): 57 years (SD 15): 59 (SD 14); BMI: not stated comorbidities: not stated</p>	<ol style="list-style-type: none"> 1) Forced air cover (Augustine Medical) + warmed IV fluids (fluid warmer)-activated (active warming device); duration:; 40°C; n=39 2) Forced air cover (Augustine Medical) + warmed IV fluids (fluid warmer)- not activated (active + passive); duration:; 'ambient temp'; n=35
<p>Monga 1996 Trial held in USA Funding: not stated</p>	<p>Inclusion & exclusion criteria: Patients undergoing TURP for treatment of bladder outlet obstruction secondary to benign prostatic hypertrophy Surgery type: elective; surgical speciality: urology; surgery duration: not stated Anaesthesia type: general and regional; anaesthesia duration not stated; premed: not stated; ASA grade: not stated; age (range): 69.2 years; gender (m/f): 28:0; BMI: not stated comorbidities: not stated; study did not indicate how many patients randomised to each group. Assumed equal numbers randomised to the warmed (active and passive) and control group.</p>	<ol style="list-style-type: none"> 1) Warmed irrigation fluid (Abbott level-one fluid warmer) (active fl); duration:; amount; n=not stated 2) Unwarmed fluid (room temperature irrigation fluid); duration:; 17°C n=not stated 3) Passively warmed fluids; 35°C n=not stated

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Moore 1996 Trial held in USA Funding: not stated</p>	<p>Inclusion & exclusion criteria: incl: women undergoing elective operative laparoscopic procedures ranging from diagnostic laparoscopy to extensive lysis of adhesions & removal of adnexal structures; excl: Patients weighing less than 40 or greater than 100 kg, pregnant or undergoing Surgery type: elective; surgical speciality: gynaecology; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration more than 1h; premed: midazolam (1-2mg) IV & lidocaine 40mg IV; ASA grade: not stated; age (range): 32; gender (m/f): 0:35; BMI: 26 kg/m² comorbidities: not stated; Room temp: 20°C; In 6 patients surgery time was significantly shorter and did not require irrigation fluid; if patient's oesophageal temperature dropped below 34°C, patient was rewarmed by increasing the temp setting of heating blanket & using warmed blankets & warmed IV fluids</p>	<p>1) Lactated Ringer's solution through a pressurized fluid warming system (level 1) (active fl); 39°C; n= 13 2) Ambient temp lactated ringer's solution usual care; 20-22°C; n=16 Patients in both groups laid on a heating blanket (37.8°C) before induction until through the procedure; Patients were covered with blankets before induction of anaesthesia on upper extremities.</p>

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Motamed 1998 Trial held in Canada Funding: not stated</p>	<p>Inclusion & exclusion criteria: incl: patients diagnosed w/benign or malignant tumor of colon; colonic resection. None of the patients suffered from inflammatory bowel, malnutrition, recent significant weight loss, anaemia, morbid obesity, endocrine disorders or pyrexia. Surgery type: not stated; surgical speciality: urology; surgery duration: 1 to 3 h Anaesthesia type: general and regional; anaesthesia duration not stated; premed: none administered; ASA grade: I-II; age (range): 62 years; gender (m/f): 15:15; BMI: not stated comorbidities: not stated; Humidity: between 35-42%; stated OR and recovery room temperature measured and similar for both groups; in the unwarmed group, temperature was allowed to decrease during surgery & recovery and no rescue measure instituted if core temp < 33.5 °C; no patients had core temp < 33.5 °C;</p>	<p>1) convective warm air blanket (Mallinckrodt) + IV fluids (active pt + active pt); duration: from induction, during and after surgery; blanket: 42°C; blood warmer: 37°C; n=15 2) usual care usual care; n=15</p>

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Muth 1996 Trial held in Germany Funding: not stated</p>	<p>Inclusion & exclusion criteria: ASA III of either sex undergoing abdominal aortic aneurysm; Surgery type: elective; surgical speciality: abdominal; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration more than 1h; premed: flunitrazepam(1-2 mg p.o); ASA grade: III+; age (range): 64.5 years; gender (m/f): not stated; BMI: not stated comorbidities: not stated; Fresh gas flow:4 l/min;all blood products prewarmed in a water bath(unitherm) at 37°C prior to transfusion; no other warming devices-blankets,forced-air blowers or inspired gas heaters were used for either group.</p>	<ol style="list-style-type: none"> 1) IV fluids and blood products (Hotline Level 1) (active fl); duration:; 37°C n=25 2) IV fluids + prewarmed blood products usual care; duration:; amount; n=25

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Patel 1996 Trial held in USA Funding: loan of Hotline by Level 1 Technologies</p>	<p>Inclusion & exclusion criteria: incl: elective ASA I-III orthopaedic or gynaecologic surgery >2 hrs; excl: emergency surg, calcium channel blocker therapy, preoperative hypothermia (<35.5°C), hyperthermia (temp >38°C), head injury, otitis, presence of nasogastric tube Surgery type: elective; surgical speciality: mixed; surgery duration: over 3 h Anaesthesia type: general; anaesthesia duration not stated; premed: not stated; - ASA grade: mixed; age (range): 41; gender (m/f): 14:25; BMI: not stated comorbidities: not stated; Room temperature: 20 - 21°C; fresh gas flow: 1 and 4 l/min; ventilation controlled to maintain P_{ET} CO₂ 30 to 35 mm Hg;</p>	<ol style="list-style-type: none"> 1) Hotline fluid warmer (concurrent water heat exchange, level 1 technologies) (active fl); duration:; 35-36 °C; n= 24 2) Flotem iie (dry heat exchange technology, datachem inc) (active fl); duration:; 28-38°C; n=25

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Patel 1997 Trial held in USA Funding: loan of Hotline by Level 1 technologies</p>	<p>Inclusion & exclusion criteria: incl: elective ASA I-III orthopaedic(n=19), gynaecological (n=15) & general surgery exceeding 2 hrs; excl: emergency surgery, calcium channel blocker therapy, preoperative temp(<35.5°C or >38°C), head injury, otitis, presence of nasogastric tube, Surgery type: elective; surgical speciality: mixed; surgery duration: over 3 h Anaesthesia type: general; anaesthesia duration not stated; premed: not stated; ASA grade: mixed; age (range): 41; gender (m/f): 14:25; BMI: not stated comorbidities: not stated; Room temperature:20 - 21°C; fresh gas flow: 1 and 4 l/min; ventilation controlled to maintain P_{ET} CO₂ 30 to 35 mm Hg;</p> <p>Intra: thermal insl+warmed IV fluids vs FAW Post: thermal insl vs usual care</p>	<ol style="list-style-type: none"> 1) Reflective blankets, head covers & leggings (thermadrape)+iv fluids[Hotline fluid warmer (concurrent water heat exchange, Level 1 Technologies)] (active fl); duration: applied in the hold area through op and recovery. Unclear how long before induction 2) Upper body convective warming (Bair Hugger, Augustine Medical)+ IV fluids (active fl); duration: after induction until end of surgery; cotton sheet; bh:43°C IV:21°C n=19

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Pit 1996 Trial held in Netherlands Funding: not stated</p>	<p>Inclusion & exclusion criteria: incl: patients willing to undergo spinal anaesthesia; Excl criteria not stated. Surgery type: not stated; surgical speciality: urology; surgery duration: 30 to 60 min Anaesthesia type: regional; anaesthesia duration not stated; premed: not stated; ASA grade: not stated; age (range): 72 years (59-86); gender (m/f): 59:0; BMI: not stated comorbidities: not stated; Resection time not sig diff; volume of irrig fluid not stated; IV fluid-room temperature during and after TURP; after TURP, continuous flow of irrigation fluid at room temperature.</p>	<ol style="list-style-type: none"> 1) intermittent irrigation with 5% sorbitol containing chlorhexidine (fluid heater, Level 1) (active fl); duration:; set at 37.5°C; never <36.8°C; n=28 2) room temperature irrigation fluid usual care; duration:; 20.6°C; n=31

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Schmeid 1996 Trial held in Austria Funding: Augustine Medical; Mallinckrodt donated thermocoup</p>	<p>Inclusion & exclusion criteria: I: pts undergoing initial, unilateral total hip arthroplasty; none of the arthroplasties was for treatment of tumour. E: patients with history of excessive bleeding, bruising, having PTT>35s, PT< 70% clot formation, fibrinogen <200 mg/dl, platelet count < 100,000/μL; Surgery type: elective; surgical speciality: orthopaedics; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration not stated; premed: 10 mg oral diazepam 1-2 hr before surgery; no. ASA grade: I-III; age (range): 63 years (SD 10): 63 (10); gender (m/f): 23:37; BMI: not stated comorbidities: not stated; Room temp: 21°C; blood loss replaced w/colloid, haemodilution blood, scavenged red cells & allogeneic transfusions; intraop colloid(haemodilution): 870 v 880 ml; intraop colloid (additional):217ml (SD 303) v 80 (SD 173); intraop blood(haemodilution):470 ml vs 450 ml</p>	<ol style="list-style-type: none"> 1) Forced air warming (upper))+ warmed intravenous fluids (37°C (active pt + active fl); duration:; pts temp maintained near 36.5°C;FAW:high; IV-37°C; n= 30 2) Not stated usual care;duration:; patients temperature allowed to decrease to 35°C; n=30

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Smith 1998 Trial held in USA Funding: not stated</p>	<p>Inclusion : type of surgery: laparascopy (74%), hysterectomy(21%),cone biopsy (14%); Exclusion: head injury, otitis, and preoperative temp greater or equal to 38°C or less than or equal to 35.5°C and patients taking calcium channel blockers. Age: 33 (SEM 2): Surgery type: elective; surgical speciality: gynaecology; Duration of surgery: 67 min (SEM 16): 75 (SEM 15) Anaesthesia type: general; anaesthesia duration more than 1h; premed: not stated; ASA grade: I-III; age (range): 33; gender (m/f): 0:38; BMI: not stated; comorbidities: not stated; gas flow: 2l/min;room temp:@ 21°C;</p>	<p>1) Hotline (Level 1) (active fl); duration: until end of surgery; then rt fluids; set point: 42°C (delivers at 38-39 °C); n=18 2) Room temperature fluids usual care; 21°C; n=20</p>

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Smith 1998b Trial held in USA Funding: not stated</p>	<p>Inclusion & exclusion criteria: Inclusion: type of surgery: major gynaecologic, orthopaedic & general surgery scheduled to last at least 90 min; Exclusion: emergency surgery, preoperative use of calcium channel blockers, head injury, otitis, and preoperative sublingual temp $\geq 38^{\circ}\text{C}$; Surgery type: elective; surgical speciality: gynaecology; surgery duration: 30 to 60 min Anaesthesia type: general; anaesthesia duration more than 1h; premedication: not stated; no. ASA grade: mixed; age (range): 44; gender (m/f): 15:41; BMI: not stated Comorbidities: not stated; gas flow: 2 l/min; room temp: @ 21°C; sublingual temp measured preoperative and postoperative; cessation of FAW after 131 min and 165 min for the intervention and control groups, respectively.</p>	<ol style="list-style-type: none"> 1) Hotline (Level 1) (active fl); duration: until end of surgery; then rt fluids; set point: 42°C (delivers at $38\text{--}39^{\circ}\text{C}$); n=31 2) Room temperature fluids (room temp IV fluids); duration:; 21°C; n=30

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Steinbrook 1997 Trial held in USA Funding: not stated</p>	<p>Inclusion & Exclusion criteria: Patients undergoing major intraabdominal surgery with no contraindication to epidural anaesthesia. Excluded: if ASA status IV or greater, evidence of malnutrition, anaemia, fever or an endocrine disorder.</p> <p>Surgery type: not stated; surgical speciality: abdominal; surgery duration: not stated</p> <p>Anaesthesia type: general and regional; anaesthesia duration not stated; premed: IV midazolam (1 to 4mg) and fentanyl (100 to 250 µg);</p> <p>ASA grade: mixed; age (range): 45; gender (m/f): not stated; BMI: not stated</p> <p>comorbidities: not stated;</p> <p>Ambient temp: 20-22°C in OR and PACU; inspired gases not heated or actively humidified but passive humidification provided with HME filter for all patients;</p> <p>postoperative analgesia: patient controlled epidural infusion bupivacaine 0.125% with hydromorphone 0.02mg/ml.</p>	<ol style="list-style-type: none"> 1) Bair Hugger (Augustine Medical) + IV fluids (Fenwal model) (active pt + active fl); duration: FAW: maintained pt oesophageal temperature close to 37°C; IV fluids: 37°C; n=5 2) Not stated usual care; duration:; FAW or active IV not used unless patient temp <35°C; n= 4

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Zhao 2005 Trial held in China Funding: not stated</p>	<p>Inclusion & exclusion criteria: inc: Patients scheduled for abdominal surgery lasting at least 2 hours; Ex: pts w/coagulation disorder, severe malnutrition (total plasma albumin <3.0 g/l, white blood count <2.5x10⁹/l), recent history of fever or infection, history of endocrine disease; Patients with recent use of immunosuppresants perioperative phase: intrafluids Surgery type: not stated; surgical speciality: not stated; surgery duration: not stated Anaesthesia type: general; anaesthesia duration more than 1h; Premedication; no; ASA grade: I-II; age (range):52(SD 13): 44 (SD 15); 18-70; gender (m/f): 23:17; BMI: not stated comorbidities: not stated; Concurrent treatments, ward temperature, irrigation fluid, IV fluid, humidity, air flow *FAW: lowered to medium 41-42 if core temperature went above 37.8°C. Colloid infusion: 800 ml (SD 474) v 945 (SD 394);</p>	<ol style="list-style-type: none"> 1) Forced air warming + actively warmed intravenous solutions including blood (39°C (active pt + active fl); duration:; FAW: high (42-43°C)*fluid: warmflo:39°C; n=20 2) Single layer of cotton sheet usual care; duration:; amount; n=20

C9: INTRAOPERATIVE PHASE: GASES

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Backlund 1998 Trial held in Finland Funding: not stated</p>	<p>Inclusion & exclusion criteria: i; ASA I-III scheduled for laparoscopic surgery (fundoplication; hernioplasty; resection of sigmoid colon; rectopexia); e: BMI >30 kg/m²; abnormal renal function; duration of surgery <90min; conversion to laparotomy Surgery type: elective; surgical speciality: mixed; surgery duration: 1 to 3 h Anaesthesia type: not stated/unclear; anaesthesia duration not stated; premed: not stated; ASA grade: mixed; age (range): 51; gender (m/f): 15:11; BMI: 25 kg/m² comorbidities: not stated; Fluids: Ringer's acetated solution: 8ml/kg during induction; 10ml/kg/h Ringer's solution & hydroxyethyl starch; all fluids prewarmed;</p>	<ol style="list-style-type: none"> 1) Warmed insufflated CO₂ + waterbath mattress (39°C (active pt + active gas); duration:; 37°C (prewarmed); vol: 110 l (SD 53); n=13 2) Usual care gas; duration:; room temperature-21°C; vol 171l (SD 76); n=13

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Champion 2006 Trial held in USA Funding: not stated	Inclusion & exclusion criteria: i: morbidly obese patients undergoing laparoscopic antecolic proximal Roux-en-Y gastric bypass using the linear stapler technique; exclusion criteria not stated Surgery type: not stated; surgical speciality: abdominal; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration not stated; premed: not stated; ASA grade: not stated; age (range): 42 years (23-59); gender (m/f): 7:43; BMI: 36-66 kg/m ² comorbidities: not stated; Room temp: 16°C; no warming blankets or other external heat sources were used; hydromorphone HCl 1.0 mg intramuscularly every 3 hrs as requested was used in the PACU and postoperatively for pain management	1) Warmed CO ₂ (Insuflow device, lexion medical) (active warming device); duration: not stated; 35°C; 95% relative humidity; n= 25 2) Cold dry CO ₂ usual care; n=25

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Conahan 1987 Trial held in USA Funding: Fisher & Paykell supplied the heater/humidifier units; filac corp electronic thermometers</p>	<p>Inclusion criteria: women participating in an in vitro fertilization programme, patients scheduled to undergo laparoscopy ovum harvesting in an ambulatory surgery unit. Exclusion criteria is not stated; Age: 32.1 years (SEM 1): 33.8 (SEM 0.8); Surgery type: elective; surgical speciality: gynaecology; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration: 70 min (SEM 6): 66 (SEM 5); premed: not stated; ASA grade: not stated; age (range): 33 years; gender (m/f): 0:19; BMI: not stated comorbidities: not stated; Cotton blankets provided to all patients in the recovery room; or temp: 22.5°C; recovery room temp: 23°C</p>	<p>1) Heated humidified inspired gas (Fisher & Paykell) (warmed gas); duration: activated immediately after induction of anaesthesia; 38-39°C; n=10 2) Usual care inspired gas usual care gas; duration:; amount; n=9</p>

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Eckerrbom 1990 Trial held in Sweden Funding: supported by an university grant</p>	<p>Inclusion & exclusion criteria: i: dental & oral surgery, transsphenoidal hypophysectomy, middle ear surgery, surgery of the pharynx, nose & neck. Exclusion criteria not stated. Surgery type: not stated; surgical speciality: mixed;; surgery duration: mixed Anaesthesia type: not stated/unclear; anaesthesia duration more than 1h; premed: not stated; ASA grade: not stated; age (range): 44 years; gender (m/f): 10:10; BMI: comorbidities: not stated; Patients in both arms received IV fluids (room temp) and 1 aluminum blanket (astronaut blanket)+ 2cotton sheets</p>	<p>1) Warmed inspired gas (HME) (active gas); n=10 2) Usual care inspired gas usual care gas; n=10</p>
<p>Farley 2004 Trial held in USA Funding: not stated</p>	<p>Inclusion & exclusion criteria: il: pts 18-100 years undergoing laparoscopic cholecystectomy; e:16 patients excl [11 converted to open cholecystectomy, 3 underwent additional operations, 2 had insuflow device removed] Surgery type: not stated; surgical speciality: abdominal; surgery duration: 1 to 3 h Anaesthesia type: not stated/unclear; anaesthesia duration not stated; premed: orally: codeine, meperdine, oxycodone, propoxyphene; IV: meperdine, fentanyl, morphine; ASA grade: not stated; age (range): 52 years (19-86); gender (m/f): 32:69; BMI: 29.6 kg/m² comorbidities: not stated; Bair Hugger (Augustine Medical) used on 32/49 and 34/52 patients by anaesthetist blinded to treatment.</p>	<p>1) Warmed humidified CO₂ (insuflow device) (active warming device); duration: not stated; n=49 2) Standard CO₂ insufflation usual care; duration: not tated; n=52</p>

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Goldberg 1992a Trial held in USA Funding: not stated</p>	<p>Inclusion & exclusion criteria: i: ASA I-III patients scheduled for lower abdominal procedures lasting 1-4 hours. Exclusion criteria not stated. Surgery type: elective; surgical speciality: abdominal; surgery duration: mixed Anaesthesia type: general; anaesthesia duration more than 1h; premed: not stated; ASA grade: mixed; age (range): 43(16-69); gender (m/f): not stated; BMI: not stated comorbidities: not stated; Sublingual measurements also provided. SDs not provided for oesophageal so sublingual used in the results; OR temp: 21-21.5°C PACU temp: 21.6 to 23.1°C duration 1-4 hr mean: 1h-3.5.</p>	<ol style="list-style-type: none"> 1) Heated-humidifier (Fisher & Paykel) (active warming device); 37°C n=14 2) Usual care; n=16 3) HME (Pall ultipore filter); n=21

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Hamza 2005 Trial held in USA Funding: not stated</p>	<p>Inclusion & exclusion criteria: i: morbidly obese patients undergoing laparoscopic Roux-en-Y gastric bypass surgery; e: pregnant or lactating or clinically significant heart, liver or renal disease; if core temp $\leq 34^{\circ}\text{C}$ during operation. Surgery type: elective; surgical speciality: abdominal; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration more than 1h; premed: 2-3mg IV midazolam; ASA grade: not stated; age (range): 44.5; gender (m/f): 3:41; BMI: not stated comorbidities: not stated; Oesophagel core temp- baseline & intraop; tympanic- end of surgery & postop; or temp: 20°C or humidity: 43.5%; PACU temp: 22°C PACU humidity: 44%; irrig volume: 694 l (SD 480) v 594l (SD435); total IV fluids: 4.217ml(SD1.09) v 4.840ml(SD0.99);</p>	<ol style="list-style-type: none"> 1) Warmed CO_2 insufflation gas (insuflow device) (active warming device); duration: 108 (21) min; 37°C 95% relative humidity; n=23 2) Standard CO_2 insufflation gas (passed through anactive insuflow device) usual care; duration: 120 (43) min; amount; n=21
<p>Hynson 1992 Trial held in USA Funding: Mon-a-Therm;Datex medical instrumentation inc</p>	<p>Inclusion & exclusion criteria: included: kidney transplant patients with history of insulin-dependent diabetes, CV disease, hypertension or medication history. Excluded: obesity (150% of ideal body weight), peripheral vascular disease, limb amputation or preop infection or fever Surgery type: not stated; surgery duration: not stated; anaesthesia duration more than 1h; premed: midazolam 1-3 mg; ASA grade: not stated; age (range):; gender (m/f): 5:5; BMI: not stated comorbidities: not stated; or temp: 20°C.</p>	<ol style="list-style-type: none"> 1) Heated-humidifier (active warming device); duration: 180 min; 40°C; n=5 2) Usual care usual care; duration:; amount; n=5

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Johansson 2003 Trial held in Sweden Funding: gibeck respiration ab for supply of the humidity sensory system</p>	<p>Inclusion & exclusion criteria: i: ASA I-II general or urology surgery with an anticipated anaesthesia duration of 2h or longer. e: patients with signs and symptoms of pulmonray or CV disease Surgery type: elective; surgical speciality: mixed; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration more than 1h; premed: midazolam(7.5mg) rectally 30 min prior to arriving in the OR; ASA grade: I-II; age (range): 74 years; gender (m/f): 63:27; BMI: not stated comorbidities: not stated; After 120 min of anaesthesia HMEs (1,3,6 flow rates)32, 32, 29 mg H₂O/l; usual care group: 26, 22,13 mg H₂O/l</p>	<ol style="list-style-type: none"> 1) Fresh gas flow (HME) (warmed gas); 1.01 l/min flow rate; n=16 2) Usual care usual care gas; amount; n=15 3) Flow rate: 3.01 l/min 4) Flow rate: 6.01 l/min
<p>Mouton 1999 Trial held in Australia Funding: not stated</p>	<p>Inclusion & exclusion criteria: i: laparoscopic cholecystectomy Surgery type: not stated; surgical speciality: abdominal; surgery duration: not stated Anaesthesia type: general; anaesthesia duration not stated; premed: none administered; ASA grade: not stated; age (range): 23-89; gender (m/f): not stated; BMI: not stated comorbidities: not stated; Mean or temp: 21.1°C</p>	<ol style="list-style-type: none"> 1) Humidified CO₂ flowed from modified lins-10000 insufflator (active gas); duration:; 34 to 37°C humidity 8-90%; n=20 2) Standard dry insufflation gas usual care gas; duration:; 21.2 to 25.2°C humidity 0 to 5%; n=20

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Muth 1996 Trial held in Germany Funding: not stated</p>	<p>Inclusion & exclusion criteria: i:ASA III of either sex undergoing abdominal aortic aneurysm; Surgery type: elective; surgical speciality: abdominal; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration more than 1h; premed: flunitrazepam(1-2 mg p.o); ASA grade: III; age (range): 64.5 years; gender (m/f): not stated; BMI: not stated comorbidities: not stated; Fresh gas flow:4 l/min;all blood products prewarmed in a water bath(unitherm) at 37oc prior to transfusion; no other warming devices-blankets,forced-air blowers or inspired gas heaters were used for either group.</p>	<ol style="list-style-type: none"> 1) IV fluids and blood products (Hotline level 1) (active fl); 37°C n=25 2) IV fluids + prewarmed blood products usual care; amount; n=25
<p>Nelskylä 1999 Trial held in Finland Funding: not stated</p>	<p>Inclusion & exclusion criteria: i:40 ASA I or II women scheduled for laparoscopic hysterectomy for benign diseases; e: age :<18 or >55 years, BMI>26 kg/m², known allergy to ketoprofen, ASA status ≥ III & any medications affecting CV or CNS. Surgery type: elective; surgical speciality: gynaecology; surgery duration: 30 to 60 min Anaesthesia type: general; anaesthesia duration more than 1h; premed: 10 mg/os diazepam 60 min before preop data collection; ASA grade: I-II; age (range): 46.5 (34-55); gender (m/f): 0:37; BMI: not stated comorbidities: not stated; Warmed IV and irrigation fluid (38°C); or temp: 20.5-22.0°C</p>	<ol style="list-style-type: none"> 1) Heated CO₂ insufflator (Thermoflator, karl storz) (active warming device); duration:; 37°C 12-14 mm hg; n=not stated 2) Unheated CO₂ insufflation gas (electronic CO₂ endoflator, karl storz) usual care; duration:; amount; n=not stated

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Nguyen 2002 Trial held in USA Funding: not stated</p>	<p>Inclusion & exclusion criteria: i: patients evaluated for Nissen fundoplication; eligible if workups confirmed gastroesophageal reflux & <60years; e: previous gastric surgery or history of chronic narcotic usage Surgery type: not stated; surgery duration: 1 to 3 h Anaesthesia type: not stated/unclear; anaesthesia duration not stated; premed: not stated; ASA grade: not stated; age (range): 44; gender (m/f): 11:9; BMI: not stated comorbidities: not stated; Or temp: 20-22°C</p>	<ol style="list-style-type: none"> 1) Heated and humidified insufflation gas CO₂ using insufflow device (Georgia biomedical1) + upper body warming blanket (Bair Hugger) (active pt + active gas); duration:; 37°C humidity 95%; n= 10 2) Standard CO₂ (active pt + usual care gas); duration:; room temperature; <5% humidity; n=10
<p>Ott 1998 Trial held in USA Funding: not stated</p>	<p>Inclusion & exclusion criteria: e:pregnant or cancer patients perioperative phase: intragases Surgery type: not stated; surgical speciality: gynaecology:; ; surgery duration: mixed Anaesthesia type: not stated/unclear; anaesthesia duration not stated; premed: not stated; ASA grade: not stated; age (range): 18-48 years; gender (m/f): 0:72; BMI: not stated comorbidities: not stated; Duration of surgery: 38-262 min;at 4 hours: 30 pts in warmed CO₂ and 31 in standard CO₂ group; OR temp: 19.5-21.5°C humidity 42-59%; CO₂ volume: 82-680l; irrigation vol: 0.3-12l at 26°C core temp measured with endotracheal temperature problem.</p>	<ol style="list-style-type: none"> 1) Warmed CO₂ (insuflow) (active gas); duration:; amount; n=not stated 2) Standard CO₂ + underpad warmer (active pt + usual care gas); duration:; amount; n=not stated

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Saad 2000 Trial held in Germany Funding: not stated</p>	<p>Inclusion & exclusion criteria: i: patients with symptomatic cholecystolithiasis undergoing laparoscopic cholecystectomy Surgery type: not stated; surgical speciality: abdominal; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration not stated; premed: not stated; ASA grade: I-II; age (range): 56.5; gender (m/f): 8:12; BMI: not stated comorbidities: not stated;</p>	<ol style="list-style-type: none"> 1) Warmed CO₂ gas for abdominal insufflation (flow therme, Wisap) (active pt + active gas); 37°C n=10 2) Cold CO₂ insufflation (Electronic laparoflater) usual care gas; 21°C n=10
<p>Savel 2005 Trial held in USA Funding: lexicon medical provided insuf flow device</p>	<p>Inclusion & exclusion criteria: i: patients undergoing laparoscopic Roux-en-Ygastric bypass [BMI>40 kg/m² or BMI>35 kg/m² with medical problems] Surgery type: not stated; surgical speciality: abdominal; surgery duration: 1 to 3 h Anaesthesia type: general; premed: not stated; ASA grade: not stated; age (range): 40; gender (m/f): 5:25; BMI: 51.5 comorbidities: not stated; Forced air warming (Bair Hugger) applied at discretion of the attending anesthesiologist, blinded to the study.</p>	<ol style="list-style-type: none"> 1) Wam and humidified CO₂ using insuf flow filter heater hydrator (Lexion Medical) (active gas); 35°C 95% humidity; n=15 2) Room temperature non-humidified CO₂ usual care gas; amount; n=15

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<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Slim 1999 Trial held in France Funding: not stated</p>	<p>Inclusion & exclusion criteria: Patients undergoing laparoscopic upper abdominal surgery including cholecystectomy for symptomatic, uncomplicated gallstone disease, posterior fundoplication for gastroesophageal reflux disease, & Heller's myotomy for achalasia. Surgery type: elective; surgical speciality: abdominal; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration not stated; premed: not stated; ASA grade: I-II; age (range): 52.5; gender (m/f): 1:1.4 in each group; BMI: 26.3 kg/m² comorbidities: not stated; Subdiaphragmatic temp</p>	<ol style="list-style-type: none"> 1) Warmed CO₂ (Thermoflator) (active gas); duration:; 36.2°C intra-abdominal pressure maintained at 14mm; n=49 2) Cold CO₂ (Thermoflator) usual care gas; duration:; amount; n=51
<p>Stone 1981 Trial held in USA Funding: not stated</p>	<p>Inclusion criteria: 42 men expected to have surgical procedures lasting 3 or more hours; Exclusion criteria not stated</p> <p>Surgery type: mixed: laminectomy; major abdominal; major vascular; total hip; radial neck surgery duration: over 3 h Anaesthesia type: general; anaesthesia duration more than 1h; premed: type of premedication not stated; premeds given 30-45 min prior to induction; ASA grade: not stated; age (range): not stated; gender (m/f): 42:0; BMI: not stated comorbidities: not stated; Patients received circulating water blankets (38°C).</p>	<ol style="list-style-type: none"> 1) Inspired heated and humidified gases (active warming device); amount; n=10 2) usual care gas; amount; n=10

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Tølløfsrud 1984a Trial held in Norway Funding: not stated</p>	<p>Inclusion & exclusion criteria: i:40 patients scheduled for surgery on the abdominal aorta(straight or bifurcated prosthesis); e: patients with body temperature of over 37.5 °C or under 36.5°C on the morning of surgery perioperative phase: intragases Surgery type: elective; surgical speciality: abdominal; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration more than 1h; premed: <75years: morphine (5-15mg)i.m. Combined w/scopolamine (0.2-0.6mg)30-60min before arrival into OR; >75years:pethidine 30mg im; ASA grade: not stated; age (range): 64; gender (m/f): 8:2; BMI: not stated comorbidities: not stated; Blood and plasma warmed to 37°C</p>	<ol style="list-style-type: none"> 1) Warming blanket(Gorman rupp); 45x60cm (active warming device); 38-40°C n=10 2) Usual care usual care; amount; n=10 3) Warming blanket + heated humidifier; n=10 4) Heated-humidifier(Bennett cascade humidifier) 37-40°C n=10
<p>Tølløfsrud 1984b Trial held in Norway Funding: not stated</p>	<p>Inclusion & exclusion criteria: i:40 patients scheduled for surgery on the abdominal aorta(straight or bifurcated prosthesis); e: patients with body temperature of over 37.5°C under 36.5°C on the morning of surgery perioperative phase: intragases Surgery type: elective; surgical speciality: abdominal; surgery duration: 1 to 3 h Anaesthesia type: general; anaesthesia duration more than 1h; premed: less than 75years: morphine (5-15mg)i.m. Combined w/scopolamine (0.2-0.6mg)30-60min b4arrival into or; greater than 75 years:pethidine 30mg im; ASA grade: not stated; age (range): 64; gender (m/f): 8:2; BMI: not stated comorbidities: not stated; Blood and plasma warmed to 37°C</p>	<ol style="list-style-type: none"> 1) Warming blanket(Gorman rupp); 45x60cm (active warming device); duration:; 38-40°C n=10 2) Usual care usual care; duration:; amount; n=10 3) Warming blanket + heated humidifier; n=10 4) Heated-humidifier(bennett cascade humidifier) 37-40°C n=10

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Wills 2001 Trial held in Australia Funding: Cook Medical loaned equipment</p>	<p>Inclusion criteria: laparoscopic fundoplication; Exclusion: if patient allergic to morphine, large hiatal hernia (>6cm), previous oesophageal surgery, requiring concomitant procedure such as cholecystectomy, postoperative intubation, conversion to an open procedure Surgery type: elective; surgical speciality: Surgery duration: 30 to 60 min Anaesthesia type: general; anaesthesia duration not stated; premed: midazolam (0.1mg/kg) i.m; ASA grade: not stated; age (range): 47.5 (21-71): 52.2 (28-74); gender (m/f): 22:18; BMI: 28 kg/m² comorbidities: not stated; Warming device placed over the upper torso and head (Bair Hugger); OR temp: 20 to 22°C.</p>	<ol style="list-style-type: none"> 1) Heated CO₂ (lins-2000, Cook Australia) (active pt + active gas); 22 to 30.5°C (at 1 to 6 l/min); n= 19 2) Standard CO₂ (active pt + usual care gas); amount; n=21
<p>Youngberg 1985 Trial held in USA Funding: not stated</p>	<p>Inclusion & exclusion criteria: Patients undergoing surgery over 90 min. Exclusion: ASA IV patients or those with preexisting pulmonary problems Surgery type: not stated; surgical speciality: not stated; surgery duration: 1 to 3 h Anaesthesia type: not stated/unclear; ; premed: not stated; ASA grade: ASA I-III; age (range): not stated; gender (m/f): not stated; BMI: not stated comorbidities: not stated;</p>	<ol style="list-style-type: none"> 1) Heated-humidified (Conchatherm iii) inspired gas (active gas); between 35°C and 37°C n=20 2) Usual care usual care gas; amount; n=20

C10: PHARMACOLOGICAL AGENTS - PREVENTION

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Ikeda 1999 Trial held in Japan RCT	Inclusion and exclusion criteria: minor oral surgery. Excluded if obese, taking medication, history of thyroid disease, dysautonomia or Raynaud's syndrome. Age (range): mean 32 years (14 years); gender (m/f): 8:10 comorbidities: not stated; IV fluids warmed to 37°C; ambient temperature 25-26°C; patients covered with single cotton blanket and surgical drape	1) Phenylephrine (alpha adrenergic agonist); duration: not stated; 0.5microgram/ kg/min; n=9 2) No treatment control usual care;duration: not stated; n=9
Mizobe 2006 Trial held in Japan RCT	Inclusion and exclusion criteria: excl: obese, febrile, receiving vasodilators or drugs altering thermoregulation; thyroid disease; dysautonomia. Age (range): 29-61 years, mean around 48 years; gender (m/f): not stated Ambient temperature 24°C; covered with cotton sheet pre-operatively and drapes during surgery	1) Fructose infusion (sugars); duration: 4 hr starting 3 hr before induction; 0.5g/kg/hr; n=20 2) Saline infusion (placebo); duration: 4 hr starting 3 hr before induction; n=20
Mohamed 2005 Trial held in Egypt RCT	Inclusion and exclusion criteria: patients scheduled for abdominal operations of expected duration 3-5 hours. Exclusion: core temperature >37.2°C; patients not expected to withstand volume expansion; thyroid dysfunction, end stage renal failure, hepatic failure, major respiratory and cardiovascular disease not stated	1) IV amino acid infusion and saline (amino acid); duration: 1 hr preoperative to end 1st hr of op; 125ml/hr; n=20 2) Saline only (placebo); duration: 1 hr preoperative to end 1st hr of operation; n=20

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Piper 2000 Trial held in Germany RCT</p>	<p>Inclusion and exclusion criteria: abdominal or orthopaedic surgery. Exclusion: vasoconstrictors during surgery, alpha 2 agonist for long-term treatment, fever, muscle disease, parkinson's disease Age (range): mean around 50 years; gender (m/f): 58: 62 not stated covered with sheet</p>	<ol style="list-style-type: none"> 1) Urapidil IV (alpha 1 antagonist); duration: at end of surgery; 0.2mg/kg; n=30 2) Saline (placebo); duration: at end of surgery; n=30 3) Clonidine 3microg/kg; n=30; meperidine 0.4mg/kg; n=30
<p>Piper 2001 Trial held in Germany RCT</p>	<p>Inclusion and exclusion criteria: abdominal, urological or orthopaedic surgery. Exclusion: cardiac failure, muscle disease, parkinson's disease, required vasoconstrictors perioperatively, long-term alpha2 agonists, fever. Age (range): mean around 53 years; gender: not stated; No active warming</p>	<ol style="list-style-type: none"> 1) Urapidil (alpha 1 antagonist); duration: at end of surgery; 0.2mg/kg; n=30 2) Saline (placebo); duration: at end of surgery; n=30 3) Urapidil 0.3mg/kg; n=30); urapidil 0.4mg/kg; n=30 4) Clonidine 3microg/kg; n=30
<p>Sahin 2002 Trial held in Turkey RCT</p>	<p>Inclusion and exclusion criteria: craniotomy for supratentorial tumour excision. Exclusion: tumours larger than 3cm diameter, invasion into midbrain/hypothalamus, hydr°C ephalus, infratentorial tumour. Age (range): mean around 48 years; gender (m/f): 21: 19 All patients received dextrose-free crystalloids and colloids at room temperature; ambient temperature 21°C (SD 1); at end of surgery, patients with temperature < 35°C warmed by Bair Hugger in PACU before extubation</p>	<ol style="list-style-type: none"> 1) Amino acid solution and anaesthetic regimen of isoflurane (amino acid); duration: not stated; 100kj/hr; n=10 2) Only the anaesthetic regimen of isoflurane usual care;duration: not stated; n=10 3) Amino acid 100kj/hr plus propofol; n=10 4) Propofol only; n=10

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Sellden 1994 Trial held in Sweden RCT	Inclusion and exclusion criteria: all but 1 minor surgery Age (range): mean 52 years; gender (m/f): all male, Theatre temperature 21-23°C; no warming except patients 1 patient with partial gastrectomy in amino acid group (major surgery) had 4 units warmed blood; temperature measured using mixed venous blood from pulmonary artery	<ol style="list-style-type: none"> 1) Amino acid (amino acid); duration: started immediately before and throughout anaesthesia; 126ml/hr in addition to saline; n=10 2) Saline (placebo); duration: not stated; 500ml/hour; n=11
Sellden 1996 Trial held in Sweden RCT	Inclusion and exclusion criteria: hysterectomy for menorrhagia. Age (range): mean 48 years; gender (m/f): all female; theatre temperature 21-23°C; no warming except patients 1 patient in control group had 1 unit warmed blood	<ol style="list-style-type: none"> 1) Amino acid (amino acid); duration: 1 hr before and 1 hr during anaesthesia; 126ml/hr in addition to saline; n=8 2) Saline (placebo); duration: not stated; 500ml/hour; n=8 3) Amino acids 126ml/hr 2 hr before anaesthesia; n=8
Sellden 1999 Trial held in Sweden RCT	Inclusion and exclusion criteria: unclear Age (range): mean 50 years; gender (m/f): 27: 48not stated Theatre temperature 20-23°C; no warming except patients 5 patients had warmed blood. This report includes the patients in sellden 1994 and sellden 1996	<ol style="list-style-type: none"> 1) Amino acid (amino acid); duration: 0-2 hr before and 0-5 hr during anaesthesia; 126ml/hr in addition to saline; n=45 2) Saline (placebo); duration: not stated; n=30

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
Umenai 2006 Trial held in Japan RCT	Inclusion and exclusion criteria: off-pump CABG (elective/urgent); ASA grade II or III; 40-85 years. Exclusion: minimally invasive direct CABG; concomitant major surgery; previous CABG/valvular heart operation; intra-aortic balloon pump support; severe hepatic disease, renal information not stated Ambient temperature near 23°C; covered with 1 layer sheet during surgery; circulating-water warming mattress under patients set to 37°C	<ol style="list-style-type: none"> 1) Amino acid infusion (18 amino acids) (amino acid); duration: starting 2 hr before surgery, for 6 hr; 4kj/kg/hr; n=94 2) Saline infusion (placebo); duration: starting 2 hr before surgery, for 6 hr; n=86
Widman 2002 Trial held in Sweden RCT	Inclusion and exclusion criteria: age: 67 (SD 7) years; gender (m/f): 23: 23; comorbidities: not stated; ambient temperature 21°C. Hip arthroplasty; duration of surgery 78 (SD 15) and 80 (SD 20) min	<ol style="list-style-type: none"> 1) Amino acid (amino acid); duration: 1 he before surgery and during; n=22 2) Acetated ringer's solution (placebo); duration: not stated; n=24

C11: TREATMENT: WARMING DEVICES

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Alfonsi 2003 Trial held in France Funding: NIH, Joseph Drown Foundation & Kentucky Trust Fund</p>	<p>Final intraoperative temperature 35.1°C (SD 0.4). All recovering from knee (6 and 7 patients in warmed and control groups) or shoulder arthroscopy (3 and 2 patients). None febrile. Pain treated with paracetamol when necessary (2g) exclusions: not stated surgery type: not stated; surgical speciality: orthopaedics; grade 2; surgery duration: 1 to 3 h Anaes type: general and regional; anaes duration: more than 1h; premedication: none No. Of intub/vent patients postoperative: no patients Severity of hypothermia: mild (35.0-35.9); ASA grade: I-II; age (range): 31 years (18-40); gender (m/f): 18:0; BMI: none obese; height 178cm, weight 71 kg Comorbidities: not stated; none stated. None taking beta-blockers, or beta2 receptor antagonists. No history of thyroid or neuromuscular disease, dysautonomia, raynauds Not warmed intraoperative unless <35°C; IV fluids not warmed. Ambient PACU temperature=20.8°C; surgery 87 min (SD37); ~2/3rds smokers. No paracetamol allergies.</p>	<ol style="list-style-type: none"> 1) Forced air warmer (Bair Hugger forced air cover) (active warming); duration: unclear, started on arrival in PACU; high (43°C setting); intervention body area covered: full body; proportion covered ≥ 50% treated; n=9 2) Single cotton blanket (unwarmed) (usual treatment); duration: unclear; control body area covered: unclear; positioned over body; proportion covered not stated; n=9

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Bräuer 2004 (indirect) Trial held in Germany Funding: not stated</p>	<p>Inclusion: preoperative left ventricle ejection fraction >40%; uncomplicated surgical course; postop oesophageal temperature <35.5°C; bodyweight within -10% and +30% of normal; no pre-existing endocrine disease; only low dose inotropic support on arrival in ICU surgery type: elective; surgical speciality: cardiothoracic; unclear; surgery duration: not stated Anaes type: general; anaes duration: more than 1h; premedication: flunitrazepam 2 mg given night before surgery and 1 h before anaesthesia No. Of intub/vent patients postoperative: all patients Severity of hypothermia: not stated; ASA grade: III +; age (range): median 64 (50-75) years; gender (m/f): 50:0; BMI: not stated; height 154(160-192)cm; weight 78(51-120)kg comorbidities: not stated; but see exclusions Additional drugs in ICU: low dose catecholamines prn & nitroglycerin 0.4-0.6mcg/ kg/min. IV meperidine for shivering. infusions at room temp; blood: 37°C; room temp 22.8 °C. Heat and moisture exchangers used.</p>	<ol style="list-style-type: none"> 1) Forced air warmer (Warm Touch 5700) (active warming); duration: until reached 37.5°C; maximal flow and temperature; intervention body area covered: whole body; proportion covered ≥ 50% treated; n=10 2) Forced air warmer (Bair Hugger) 500 (active warming); duration: until reached 37.5°C; maximal flow and temperature control body area covered: whole body; proportion covered ≥ 50% treated; n=10 3) Radiant heater (Aragona thermal ceilings etc x) 100 °C; 1kw, 7000-8000nm; parabolic surface (80 x 200cm); max heating mode; 75cm from chest; n=10 4) Radiant heater (self assembled): 4 hydrosun 500 halogen lamps (4x160w); 2600°C; 600-1300nm; 60cm from chest.

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Bredahl 1995 Trial held in Denmark Funding: Grants from Aalborg Stifts Julelotteri and Althin Medi Plast gra</p>	<p>Age over 50 years; elective major thoracic, abdominal, orthopaedic surgery (mainly abdominal surgery (22/30)); ASA I-II; rectal temperature less than 35.5°C, measured within 5 min of arrival in PACU; stable haemodynamics. Exclusions not stated. surgery type: elective; surgical speciality: mixed; mixed; surgery duration: 1 to 3 h Anaes type: general and regional; anaes duration: more than 1h; premedication: diazepam by mouth (abdominal, othopaedic) or pethidine midazolami i.m. (thoracic surgery) No. Of intub/vent patients postoperative: not stated Severity of hypothermia: not stated; ASA grade: I-II; age (range): 66 (50-89) years; gender (m/f): 16:14; BMI: not stated; weight 67 (45-100) kg comorbidities: not stated; none stated Pacu temp 23.5; IV fluid:37°C; dry O₂. Heat & moisture exchangers for gases; surgery duration 165 (120-320) min. Blockade reversals: atropine/neostigmine 1.0/2.5mg/h. PACU analgesia epidural morphine 0.2mg/h + bupivacaine 10mg/h (28 pts).</p>	<ol style="list-style-type: none"> 1) Radiant heater (Aragona mobile thermal ceiling) mounted ~65cm above patient's body surface + warmed (37°C) IV fluids (active warming + warmed fluids); duration: 2 h; max (500w); decreased if skin temp >37 °C; intervention body area covered: ≥ 50% treated 2) Aluminised reflective blanket (space blanket) + 3 cotton blankets+ warmed (37°C) IV fluids (thermal insulation+warmed fluids); duration: 2 h; control body area covered: body covered; proportion covered ≥ 50% treated; n=15

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Giuffre 1991 Trial held in USA Funding: not stated</p>	<p>Pacu admission temperature 35°C or less (axilla or oral). Exclusions: planned admission to critical care, preoperative fever or sepsis; open undressed burn; neurological problem with thermal instability; inability to cooperate with warming interventions. surgery type: not stated; surgical speciality: not stated; unclear; surgery duration: not stated Anaes type: not stated/unclear; anaes duration: more than 1h; premedication: not stated No. Of intub/vent patients postoperative: not stated Severity of hypothermia: moderate (34.0-34.9); ASA grade: not stated; age (range): 51.5 (sd 16.7) years; gender (m/f): 30:60; BMI: not stated comorbidities: not stated; Anaesthesia duration 211 min (SD 95); 714 ml (SD 394) intraoperative fluid per hour; warming of fluids not stated. Mainly oral temperatures measured. Temperature measured at axilla or mouth</p>	<ol style="list-style-type: none"> 1) Forced air warmer (bair hugger) + head wrapped in warmed cotton cloth (replaced every 20min) (active warming + active warming); duration: until reached 36°C; medium setting 57°C(SD2.8); intervention body area covered: whole body; proportion covered ≥ 50% treated; n=29 2) Warmed, double thickness cotton blanket placed near skin every 20 min + additional blanket + head wrap (as above) (active warming + active warming); duration: until reached 36°C; blankets stored at 66-77°C; control body area covered: whole body; proportion covered ≥ 50% treated; n=31 3) Radiant heater (2 radiant lights 71cm from skin) + warmed thermal blanket + head wrapped in warmed cotton cloth (replaced every 20min); warmed until reached 36°C; n=30

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Hershey 1997 Trial held in USA Funding: none stated</p>	<p>Diagnostic laparotomy procedures for suspected cancer; general anaesthesia, in stable condition; PACU admission sublingual temperature <36°C. Exclusions: elderly patients (>60); previous radical oral procedures; need controlled ventilation (warm o2) surgery type: not stated; surgical speciality: gynaecology; grade 2; surgery duration: over 3 h Anaes type: general; anaes duration: more than 1h; premedication: not stated No. Of intub/vent patients postoperative : some patients Severity of hypothermia: mixed; ASA grade: not stated; age (range): 20 to 60 years; gender (m/f): mainly female; BMI: not stated comorbidities: not stated; IV fluid not reported; 29-31% patients had endotracheal tube when admitted to PACU. Mean time in or 184-233 min. Oral temperature measured Temperature measured at mouth</p>	<ol style="list-style-type: none"> 1) Reflective (aluminised) blanket + reflective head covering + two warmed thermal blankets (not stated to be changed; temperature not stated) (active warming + thermal insulation); duration: until temperature reached 36°C; not applicable; intervention covered area body and head; proportion covered ≥ 50% treated; n=48 2) Reflective (aluminised) blanket + two warmed thermal blankets (not stated to be changed; temperature not stated) (active warming + thermal insulation); duration: until temperature reached 36°C; not applicable; control body area covered: whole body; proportion covered ≥ 50% treated; n=48 3) Two warmed thermal blankets (not stated to be changed; temperature not stated); intervention time: until temperature reached 36°C; n=48

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Jackson 1997 Trial held in South Africa Funding: none stated; hospital/university research study</p>	<p>Patients had a rectal temperature of 35.9°C or less on admission to ICU. Patients did not receive any intraoperative warming. Exclusions: not stated surgery type: not stated; surgical speciality: not stated; unclear; surgery duration: not stated Anaes type: general; anaes duration: not stated; premedication: not stated No. Of intub/vent patients postoperative: not stated Severity of hypothermia: not stated; ASA grade: not stated; age (range): 62 (18-85) years; gender (m/f): 13:7; BMI: not stated comorbidities: not stated; none stated ICU temperature controlled between 22 and 24°C. All patients in ICU; fluid warming not stated. Temperature measured at rectum</p>	<ol style="list-style-type: none"> 1) Forced air warmer (Warm Touch) (active warming); duration: 3 hours; 42-46°C; intervention body area covered: from neck down; proportion covered ≥ 50% treated; n=10 2) 2 standard cotton blankets (usual treatment); duration: 3 hours; control body area covered: from neck down; proportion covered ≥ 50% treated; n=10

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Karayan 1996 Trial held in France Funding: not stated</p>	<p>Type of surgery: abdominal aortic surgery (aortic aneurysm repair or aortobifemoral bypass); none of the pts were obese, febrile, or history of endocrine disease. surgery type: elective; surgical speciality: cardiothoracic; grade 2; surgery duration: over 3 h Anaes type: general; anaes duration: more than 1h; premedication: cardiovascular tx orally & morphine .1mg/kgi.m. 2 hr before No. Of intub/vent patients postoperative: all patients Severity of hypothermia: mild (35.0-35.9); ASA grade: mixed; age (range): 59(42-79); gender (m/f): not stated; BMI: not stated comorbidities: not stated; Ambient or temp: 20-21°C; all infused IV fluids warmed (fenwal); treatment initiated when core temperature <36°C Temperature measured at pulmonary artery</p>	<ol style="list-style-type: none"> 1) Upper body FAW blower cover (model 520) attached to Bair Hugger model (Augustine Medical) + 2 cotton sheets (active warming + warmed fluids); duration:; intervention body area covered: upper chest and arms; proportion covered <50% treated; n=9 2) Warm cotton sheet (usual treatment + warmed fluids); duration:; control body area covered: upper chest and arms; proportion covered <50% treated; n=9

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Lennon 1990 Trial held in USA Funding: Mayo Clinic</p>	<p>Patients admitted to PACU with oral temp $\leq 35.0^{\circ}\text{C}$. Exclusions: patients who were febrile, haemodynamically unstable, mechanically ventilated, having blood products infused, or required vasoactive drugs. Those with muscle, CNS, autonomic disorders. surgery type: not stated; surgical speciality: not stated; unclear; surgery duration: not stated Anaes type: general; anaes duration: not stated; premedication: not stated No. Of intub/vent patients postoperative: no patients Severity of hypothermia: not stated; ASA grade: not stated; age (range): 59 years (18-70); gender (m/f): ns; BMI: ns; height 162cm; weight 63.0kg comorbidities: not stated; none stated (see also exclusions) Oral temperature $\leq 35^{\circ}\text{C}$; IV fluids not reported. Temperature measured at mouth</p>	<ol style="list-style-type: none"> 1) Forced air warmer (Bair Hugger); 400 w heating element; max setting limited to 43°C(active warming); duration: 90 min; ns; intervention body area covered: whole body; proportion covered $\geq 50\%$ treated; n=15 2) Warmed cotton blankets; not stated if changed systematically (active warming); duration: 90 min; warmed to 37°Ccontrol body area covered: neck to feet; proportion covered $\geq 50\%$ treated; n=15

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Stevens 2000 Trial held in Australia Funding: not stated</p>	<p>General, orthopaedic, urological, vascular or gynaecological surgery; procedure greater than 20 min; general, regional or epidural/spinal anaesthesia. PACU implied $t < 36.0^{\circ}\text{C}$. Exclusions: severely hypothermic patients excluded ($t < 34.5^{\circ}\text{C}$). Perioperative phase: postoperative; surgery type: not stated; surgical speciality: mixed; unclear; surgery duration: not stated Anaes type: mixed general and/or regional; anaes duration: not stated; premedication: not stated No. Of intub/vent patients postoperative: not stated Severity of hypothermia: mixed; ASA grade: not stated; age (range): 51 years (SD19); gender (m/f): results reported for 113 pts (m:f 56:64); BMI: not stated comorbidities: not stated; PACU temperature 19.9 to 21.1°C, 9 to 17% had warmed fluids. Study carried out post-hoc subgroup analysis without orthopaedic patients - not repeated here. Temperature measured at tympanic membrane</p>	<ol style="list-style-type: none"> 1) Forced air warmer (Bair Hugger) + head covering (blanket wrapped like a turban; not said to be warmed) (active warming + thermal insulation); duration: until 36°C reached; high setting; intervention body area covered: whole body; proportion covered $\geq 50\%$ treated; n=60 2) Warmed blanket, changed every 15 min. Temperature not stated + head covering as above (active warming + thermal insulation); duration: until 36°C reached; up to 7 blankets maximum control body area covered: whole body; proportion covered $\geq 50\%$ treated; n=60

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Summers 1990 Trial held in USA Funding: part funded by grant from Augustine Medical (Bair hugger manufacturer)</p>	<p>Inclusion: PACU tympanic temperature < 36.0°C. Exclusions: not stated surgery type: not stated; surgical speciality: not stated; unclear; surgery duration: 1 to 3 h Anaes type: not stated/unclear; anaes duration: more than 1h; premedication: not stated No. Of intub/vent patients postoperative : not stated Severity of hypothermia: not stated; ASA grade: not stated; age (range): 50 years (16-86); gender (m/f): 45:46; BMI: not stated comorbidities: not stated; Theatre temperature 20.5 (control) and 21.6°C (intervention). Total time in or 138-173 min. IV fluids not reported. Temperature measured at tympanic membrane</p>	<ol style="list-style-type: none"> 1) Forced air warmer (Bair Hugger) no details (active warming); duration: 1 hr (probably); not stated; intervention body area covered: not stated; proportion covered ≥ 50% treated; n=45 2) Warmed blankets changed as needed (temperature not stated); mean: 6 blankets (active warming); duration: 1 hr (probably); control body area covered: not stated; proportion covered ≥ 50% treated; n=46
<p>Vanni 2003 Trial held in Brazil Funding: not stated</p>	<p>Exclusion: none of the pts were obese,ferbible,taking vasoative drugs or history of endocrine diseases surgery type: elective; surgical speciality: abdominal; surgery duration: 1 to 3 h Anaes type: general; anaes duration: not stated; premedication: midazolam (7.5mg by intramusclar injection) 30 min before admission to or No. Of intub/vent patients postoperative: some patients Severity of hypothermia:; ASA grade: I-II; age (range): 39(22-56); gender (m/f): 0:20; BMI: 26 kg/m² (20-30) comorbidities: not stated; IV fluid: kept at or temp before infusion;</p>	<ol style="list-style-type: none"> 1) Forced air warming blanket (Warm Touch model 5200) over a cotton sheet with an additional cotton sheet over the warmtouch blanket (active warming); duration: 60; set at 42 to 46°C; intervention body area covered: covered up to the shoulders; proportion covered ≥ 50% treated; n=10 2) 2 cotton sheets (usual treatment); duration: 60 minutes; control body area covered: not stated; proportion covered not stated; n=10

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Participants</i>	<i>Interventions</i>
<p>Weyland 1994 Trial held in Germany Funding: none stated; university study</p>	<p>Postop oesophageal temperature <35°C; postop mechanical ventilation inICU (given until temperature reached 37°C); body weight= normal (-10% to +30%); no postop irrigation. Exclusions: not stated Perioperative phase: postoperative; surgery type: elective; surgical speciality: mixed; surgery duration: not stated Anaes type: general; anaes duration: not stated; premedication: flunitrazepam 2mg night before surgery and 1h before anaesthesia No. Of intub/vent patients postoperative: all patients Severity of hypothermia: not stated; ASA grade: I-II i; age (range): median 58 (18-76) years; gender (m/f): 17:18; BMI: not stated; height med 168 cm; weight med 67 kg comorbidities: not stated; none stated Infusions - room temp; blood - 37°C. Ambient temp 22-24°C; heat & moisture exchangers for gas. Pethidine for shivering. Unclear temperature: inclusion <35 °C; results ≥ 35. Major surgery (ortho, gynae, urology). All pts dopamine 2-3mcg/kg/min. Temperature measured at oesophagus</p>	<ol style="list-style-type: none"> 1) Overhead radiant heater (Aragona thermal ceilings ctc x); 7000-8000 nm; parabolic radiation; 75cm from patient's chest; 80-210cm long; + sheet (active warming); duration: until 37°C; 1000 w; intervention body area covered: whole body; proportion covered ≥ 50% treated; n=12 2) Standard hospital blanket (usual treatment); duration: until 37°C; control body area covered: whole body; proportion covered ≥ 50% treated; n=11 3) Electric heating blanket (Beurer Bettwarmer bw2) 50w, 150-80cm, placed between two standard hospital blankets on top of patient

APPENDIX D: QUALITY ASSESSMENT OF STUDIES

D1: RISK FACTORS PHARMACOLOGICAL AGENTS

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Alfonsi 1998	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Bilotta 2002	Adequate; computer-generated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes
Buggy	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Cheong 1998	Adequate; table of random numbers	Inadequate; table of random numbers	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Crozier 2004	Unclear; not stated	Adequate; sealed envelopes	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
De Witte 1995	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	No (\leq 20% dropouts)	Yes	Not stated	Yes
De Witte 1998	Adequate; computer generated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Delauney 1991	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes

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Study	Sequence Generation	Allocation Concealment	Outcome Assessor blinded	Patient Blinding	Attrition	Itt?	Power calculation	Baseline comparable
Goto 1999	Unclear; not stated	Unclear; not stated	Not stated	Not stated	No ($\leq 20\%$ dropouts)	Yes	Not stated	Yes
Grover 2002	Partial; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Holdcroft 1978	Unclear; random numbers	Unclear; not stated	Not stated	Not stated	Yes	Yes	Not stated	Yes
Hong 2005	Unclear; not stated	Partial; sealed envelopes	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes
Horn 1997	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Horn 1998	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Ikeda 2001	Unclear; not stated	Unclear; not stated	Not stated	Not stated	Yes	Yes	Not stated	Yes
Kelsaka 2006	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes
Kimberger 2007	Adequate; computer-generated random numbers	Partial; sealed opaque sequentially numbered envelopes	Yes double blind; impossible to blind to warm air treatment but midazolam/placebo blinded	Yes double blind	Yes	Yes	Yes	Yes

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

Study	Sequence Generation	Allocation Concealment	Outcome Assessor blinded	Patient Blinding	Attrition	Itt?	Power calculation	Baseline comparable
Kinoshita 2004	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Mao 1998	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Mathews 2002	Unclear; not stated	Adequate; sealed envelope	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Matsukawa 2001	Adequate; computer generated randomisation table	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Mizobe 2005	Adequate; computer generated code	Adequate; sealed envelopes	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Piper 2002	Unclear; not stated	Adequate; closed envelopes	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes
Piper 2004	Unclear; not stated	Partial; closed opaque envelopes	Yes double blind	Yes double blind	Yes	Unclear	Yes	Yes
Powell 2000	Unclear; not stated	Adequate; sealed envelope	Yes double blind	Yes double blind	Yes	Yes	Not stated	Not stated
Rohm 2005	Unclear; not stated	Partial; closed envelopes	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes

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Study	Sequence Generation	Allocation Concealment	Outcome Assessor blinded	Patient Blinding	Attrition	Itt?	Power calculation	Baseline comparable
Sagir 2007	Unclear; not stated	Adequate; sealed envelopes	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes
Stapelfeldt 2005	Unclear; not stated	Adequate; sealed envelopes	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes
Toyota 2004	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes
Weinbroum 2001	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes

D2: RISK FACTORS: NON-PHARMACOLOGICAL

a) RCTs

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Attrition Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Danelli 2002	Adequate; random number sequence	Unclear	Unclear; stated that nurse blinded to aim of study	No	Yes	Yes mainly; comparable for age, gender, weight, height, blood loss, and crystalloid infusion. Duration of surgery was significantly longer in the laparoscopic group (mean difference 64 min)
Frank 1992	Unclear	Unclear	Unclear	No	Not stated	Yes mainly; comparable for age, body weight, and duration of surgery, theatre temperature, and surgeon. Crystalloid administration significantly greater in GA (p=0.01); blood transfusion also greater for GA but borderline significance (p=0.06). Allowed for in anova
Frank 1994	Unclear	Unclear	Unclear; epidural catheter used regardless of group	No	Not stated	Yes mainly; comparable for age, body weight, duration of surgery, OR and PACU ambient temp. Significantly different for crystalloid admin (p=0.01; more for GA)
Hendolin 1982	Unclear	Unclear	Unclear	No	Not stated	Yes; comparable for age, weight, height, BMI, ASA, cardiovascular state and medication (not significant differences); duration of surgery, IV fluid volume, urine output.

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Attrition Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Nakajima 2002	Unclear	Unclear	Unclear	No	Not stated	Yes; comparable for age, gender, height, weight, heart rate, arterial pressure, theatre temperature, fluids, sensory block, pre-induction temperature
Nguyen 2001	Unclear	Partial; sealed envelopes	No; not likely because assessors would know which operation	No (patients reassigned to new groups); 2 patients converted to laparotomy from laparoscopy; analysed as itt	Yes	Yes; comparable for age, gender, BMI, baseline temperature, and intraoperative fluid. Not comparable for duration of surgery (but related to intervention).
Steinbrook 1997	Adequate; coin toss	Unclear	Unclear	some ($\leq 20\%$ dropouts); overall 3/27 (11%) deviation from protocol	Not stated	Some comparable; comparable: height, blood loss, opioids, preoperative temperature. Not comparable for age, weight, intraoperative fluids (may not be significant difference).

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b) Cohort studies

<i>Study</i>	<i>Temperature measurement</i>	<i>Representativeness</i>	<i>Cohort comparability</i>	<i>Patients per covariate</i>	<i>Source of Initial population exposure</i>	<i>Loss to follow up</i>	<i>Sample size calculation</i>	<i>Overall comments</i>	<i>Evidence quality</i>	
Abelha 2005; prospective study	Adequate (tympanic membrane)	Somewhat representative of the community	Acceptable: confounders taken into account in analysis (multivariate)	107 / 9 (=12)	Exposed / non-exposed from same cohort	Some patients had IPH at start of study	Adequate: all patients followed up	Not stated / unclear	Forward conditional elimination in regression. Non-cardiac patients in ICU. Preoperative temperature: 36.37°C (SD 0.49); range 35.0 to 38.6 (i.e. Some patients hypothermic by our definition but not by authors). 3 or 4 / 4 vital risk factors included; age and ASA partly included in saps ii. Warming 44% but in analysis	Low / moderate
Baker 1995; prospective study	Adequate (pulmonary artery)	Selected group eg specific operations	Confounding possible: not enough patients for multivariate analysis	56 / 13 (=4)	Exposed / non-exposed from same cohort	Unclear	Adequate: all patients followed up;	Not stated / unclear	Patient group specialised - normothermic cardiopulmonary bypass and blood temperature was kept at 37°C. Too many variables.	Biased

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<i>Study</i>	<i>Temperature measurement</i>	<i>Representativeness</i>	<i>Cohort comparability</i>	<i>Patients per covariate</i>	<i>Source of Initial population exposure</i>		<i>Loss to follow up</i>	<i>Sample size calculation</i>	<i>Overall comments</i>	<i>Evidence quality</i>
Closs 1986; prospective study	Partially adequate (aural)	Somewhat representative of the community	Confounding possible : not enough factors included	31 / 3 (=10)	Exposed / non-exposed from same cohort	Unclear	Not stated;	Not stated / unclear	Restricted operations, but temperature monitoring at wrong time. Unclear what factors included but, of important ones, only age present.	Low
El-gamal 2000; prospective study	Adequate (tympanic membrane)	Somewhat representative of the community	Comparable at baseline apart from study risk factor	40 / 1 (=40)	Exposed / non-exposed from same cohort	No patients had IPH at start of study	Adequate: all patients followed up;	Yes (and number met)	Comparable for ASA, height, weight, BMI, preoperative core temperature, duration of surgery, ambient OR temperature, ambient PACU temperature too few events for dichotomous (4); 40 patients for continuous, so ok. Orthopaedic operations only. Unlikely to have IPH at start (37.3 sem 0.1). Power calc required 15 per group	Moderate

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Study	Temperature measurement	Representativeness	Cohort comparability	Patients per covariate	Source of Initial population exposure		Loss to follow up	Sample size calculation	Overall comments	Evidence quality
Flores-maldonado 1997; prospective study	Adequate (tympanic membrane)	Somewhat representative of the community	Fairly acceptable: multivariate analysis with nearly enough patients (8-10 per covariate)	53 / 7 (=8)	Exposed / non-exposed from same cohort	Unclear	Adequate: all patients followed up;	Not stated / unclear	Study included children: mean 42 years, SD 20, range 5-90, i.e. May not be representative population.	Low / moderate
Frank 1992; prospective study	Partly adequate (sublingual well done)	Somewhat representative of the community	Confounding possible: some factors not comparable at baseline	97 / 9 (=11)	Exposed / non-exposed from same cohort	No patients had IPH at start of study	Adequate: all patients followed up;	Not stated / unclear	Spinal anaesthesia for prostate surgery; 3 / 46 patients transferred to general anaesthesia because of failed epidural block - analysed as received. Possible confounding by type of analgesia	Low
Frank 2000; prospective study	Adequate (tympanic membrane)	Somewhat representative of the community	Confounding possible: not enough patients for multivariate analysis	44 / 6 (=7)	Exposed / non-exposed from same cohort	Unclear	Adequate: all patients followed up;	Not stated / unclear	Men undergoing spinal anaesthesia for prostate surgery.	Low / moderate

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Study	Temperature measurement	Representativeness	Cohort comparability	Patients per covariate	Source of Initial population exposure	Loss to follow up	Sample size calculation	Overall comments	Evidence quality
Hind 1994a; prospective study	Adequate (oesophageal)	Somewhat representative of the community	Confounding possible: not enough patients for multivariate analysis	30 / 5 (=6)	Exposed / non-exposed from same cohort	Unclear	Adequate: all patients followed up; Not stated / unclear	1 of 2 regressions that fitted data; many correlations between 'independent' variables, i.e. some confounding (e.g. older patients first on list when theatre colder). 2 / 4 vital risk factors incl or constant (not ASA or duration)	Low
Hind 1994b; prospective study	Adequate (oesophageal)	Somewhat representative of the community	Confounding possible : not enough factors included	30 / 4 (=8)	Exposed / non-exposed from same cohort	Unclear	Adequate: all patients followed up; Not stated / unclear	1 of 2 regressions that fitted data; many correlations between 'independent' variables, i.e. some confounding (e.g. older patients first on list when theatre colder). 1 / 4 vital risk factors including or constant (not age, ASA or duration)	Low

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Study	Temperature measurement	Representativeness	Cohort comparability	Patients per covariate	Source of Initial population exposure	Loss to follow up	Sample size calculation	Overall comments	Evidence quality
Kitamura 2000; prospective study	Adequate (tympanic membrane)	Somewhat representative of the community	Comparable at baseline apart from study risk factor	27 / 1 (=27)	Exposed / non-exposed from same cohort	Unclear	Adequate: all patients followed up; Yes (and number not met)	Diabetes subgroup. Power calculation was for 15 patients per group. All groups comparable for age, BMI, IV fluid rate, duration of surgery, ambient temperature. Constant: type of anaesthesia. Sig diff for diastolic BP in tilt	Low / moderate
Kongsayre epong 2003; prospective study	Adequate (tympanic membrane)	Somewhat representative of the community	Fairly acceptable: multivariate analysis with nearly enough patients (8-10 per covariate)	105 / 12 (=9)	Exposed / non-exposed from same cohort	Some patients had IPH at start of study	Acceptable: ≤20% loss to follow up; 10 / 194 (5%) patients deliberately excluded from analysis because they were children or hyperthermic	Regression method not stated. Non-cardiac surgery; patients in ICU. Preoperative core temp 37.0 (SD 0.7); range 34.5 to 39.3°C (symmetrical non normal distribution. Age 15-93 years (ie some children). Risk factors not primary purpose of study so no sample size calculation. FAW 49%.	Low / moderate

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<i>Study</i>	<i>Temperature measurement</i>	<i>Representativeness</i>	<i>Cohort comparability</i>	<i>Patients per covariate</i>	<i>Source of Initial population exposure</i>	<i>Loss to follow up</i>	<i>Sample size calculation</i>	<i>Overall comments</i>	<i>Evidence quality</i>
Kurz 1995; prospective study	Adequate (oesophageal)	Somewhat representative of the community	Confounding possible : not enough factors included	40 / 5 (=8)	Exposed / non-exposed from same cohort	Unclear	Adequate: all patients followed up; No	Colorectal surgery. 2 / 4 risk factors considered in multivariate analysis or held constant (duration of anaesthesia, type of anaesthesia). Age and ASA grade not considered.	Low
Lau 2001; prospective study	Not stated	Somewhat representative of the community	Acceptable: confounders taken into account in analysis (multivariate)	111 / 4 (=28)	Exposed / non-exposed from same cohort	Unclear	Acceptable: ≤20% loss to follow up; 2159 / 20918 (10%) had missing data Yes (and number not met)	Very few covariates. Selected patients with operations lasting more than 2 hours. Limited to 2 months of operations. 13% patients under 15 years. 3 / 4 vital risk factors included (not duration of surgery, but all had >2h).	Moderate

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Temperature measurement</i>	<i>Representativeness</i>	<i>Cohort comparability</i>	<i>Patients per covariate</i>	<i>Source of Initial population exposure</i>		<i>Loss to follow up</i>	<i>Sample size calculation</i>	<i>Overall comments</i>	<i>Evidence quality</i>
Morris 1971; prospective study	Adequate (oesophageal)	Somewhat representative of the community	Comparable at baseline apart from study risk factor	20 / 1 (=20)	Exposed / non-exposed from same cohort	No patients had IPH at start of study	Adequate: all patients followed up;	No	3 / 4 risk factors held constant: age and type of anaesthesia. Duration of surgery at least 2h and comparable for different theatre temperatures. Very small study and confounding is possible.	Low / moderate
Roberts 1994; retrospective study	Adequate (oesophageal)	Somewhat representative of the community	Confounded: other factors not comparable at baseline	not stated	Exposed / non-exposed from same cohort	No patients had IPH at start of study	Adequate: all patients followed up;	Not stated / unclear	Nephrolithotomy. Retrospective. Univariate analysis, not allowed for confounders. Not comparable for duration of surgery and not allowed for in analysis.	Biased

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Study	Temperature measurement	Representativeness	Cohort comparability	Patients per covariate	Source of Initial population exposure		Loss to follow up	Sample size calculation	Overall comments	Evidence quality
Stewart 1998; prospective study	Adequate (intravesical)	Somewhat representative of the community	Confounded: two variables changed at once without allowance	107 / 2 (=54)	Exposed / non-exposed from same cohort	Unclear	Adequate: all patients followed up;	Yes (and number met)	Colorectal surgery. Anaesthesia and surgical method changed at same time - confounded. Significantly more IV fluids infused and blood loss for open group.	Biased
Vorrakitporn 2006; prospective study	Adequate (pulmonary artery)	Somewhat representative of the community	Acceptable: confounders taken into account in analysis (multivariate)	72 / 4 (=18)	Exposed / non-exposed from same cohort	Unclear	Adequate: all patients followed up;	Not stated / unclear	Not many factors used in multivariate analysis, but 3 / 4 vital risk factors included or held constant (not ASA).	Moderate
Yamakage 2000; prospective study	Adequate (rectal)	Somewhat representative of the community	Confounding possible : not enough factors included	60 / 1 (=60)	Exposed / non-exposed from same cohort	No patients had IPH at start of study	Adequate: all patients followed up;	Not stated / unclear	Selected operations (lumbar vertebrae). 2 / 4 risk factors included (age may have been taken into consideration in body fat calc and duration of anaesthesia effectively constant for this measurement)	Low

D3: CONSEQUENCES OF HYPOTHERMIA –

a) RCTs

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Bennett 1994	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes mainly; comparable in age, gender, body weight, height, OR temperature
Casati 1999	Unclear	Partial; sealed envelopes	Not stated; observer blinded to treatment assessed shivering, ponv and other undesirable side effects	Not stated	Yes	Unclear	Yes	Yes; age, weight, height, ASA, duration of surgery, blood loss, fluid infused and urine output
Fleisher 1998	Partial	Unclear	Anaesthesiologists and PACU staff blinded to the use of FAW and body (intraoperative) temperature measurements and data;	Not stated	Unclear		Not stated	Yes; age, weight, height, duration of surgery; RTC ASA I-II/FAW ASA I-II: 73%/81%; no significantly different among any surgical group; in PACU, at arrival time, RTC group had significantly lower temps than FAW group; no demonstrable differences in the time to attainment of PACU discharge criteria

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Study	Sequence Generation	Allocation Concealment	Outcome Assessor blinded	Patient Blinding	Attrition	Itt?	Power calculation	Baseline comparable
Frank 1995	Unclear; stratified on type of surgery	Unclear	Not stated	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, gender, height, weight, height, post induction core temperature, duration of surgery
Frank 1997	Adequate; computer generated randomization sequence	Partial; opaque sealed envelope	Not stated	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, gender, weight, height, ASA status, type of surgical procedure, history of MI and related cardiac, BP, diabetes, renal failure, preoperative erative medications
Johansson 1999	Unclear	Adequate; sequentially numbered opaque sealed envelopes	No not blinded	No not blinded	No ($\leq 20\%$ dropouts)	Unclear	Yes	Yes; comparable on age, gender, weight, height, preoperative haemoglobin, pre-medication, fluids
Kurz 1996	Adequate; computer generated	Partial; numbered sealed opaque envelopes (does not state if sequentially numbered)	Yes double blind; surgeons, or personnel and patient(s) not aware of faw and fluid heater settings	Yes double blind	Yes	Yes	Yes	Yes; comparable on age, weight, height, gender, duration of surgery, IV fluids, administered fentanyl, end-tidal isoflurane

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Lenhardt 1997	Adequate; computer generated random codes	Partial; sealed and numbered opaque envelopes	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes; comparable on age, weight, height, gender, preoperative core temperature, duration of surgery
Mason 1998	Adequate; computer generated	Partial; numbered, sealed, opaque envelopes	Not stated; blinding for PACU observations (criteria for discharge, shivering) unaware of group assignment	Not stated	Unclear	Unclear	Not stated	Yes; matched on age, gender, weight, height, or temperature , PACU temperature , duration of surgery volume of IV fluid, duration of anaesthesia
Scott 2001	Partial; block randomisation system	Partial; opaque envelopes	Not stated; outcome assessors assessing pressure ulcers blinded to treatment	Not stated	Yes	Yes	Yes	Yes; comparable on age, gender, BMI, preoperative temperature, type of anaesthetic, ASA status, surgical category, oral steroids, peripheral vascular disease, heart disease, diabetes, tobacco use.
Smith 1998	Unclear	Unclear	Not stated; post-operative data recorded by PACU nurse blinded to treatment	Not stated	Yes	Unclear	Not stated	Yes; age, weight, height, anaesthesia time, blood loss, room temperature, surgery time

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Smith 2007	Unclear	Unclear	Yes; sublingual temperatures, time to discharge and use of heating device	Not stated	No (\leq 20% dropouts); 35/191 (18%) active warming; 12/192 (6%) routine care was excluded from the analysis,	No	No	Yes mainly; Comparable of age, gender. Baseline core temperature higher for the usual group compared with active warming; Difference in type of surgery, with more patients having general surgery and fewer having orthopaedic surgery in the active warming group; 29% of patients assigned to usual care received FAW and 9% received warmed fluids at discretion of anaesthetist
Widman 2002	Unclear; not stated	Adequate; sealed envelopes	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes
Wills 2001	Adequate; random number table	Adequate; sequentially numbered opaque sealed envelopes	Yes double blind; pain	Yes double blind	No (\leq 20% dropouts)	Unclear	Yes	Yes, but limited data; comparable on age, gender, BMI`

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Winkler 2000	Adequate; computer generated random numbers table	Partial; sealed envelopes	Not stated; observations weighing gauze sponges and calculating blood recovered by RBC scavenging system blinded to group assignment	Not stated	Yes	Yes	Yes	Yes; comparable on age, gender, weight, height, ASA physical status, duration of surgery, patients with or without CV disease under or over 65 years of age.
Zhao 2005	Unclear	Unclear	Not stated; shivering evaluated by an independent observer blinded to treatment	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, body weight, duration of surgery and volume of IV

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b) Validity of normothermia/hypothermia assumption

Study	Outcomes	T _{NT} (SD) => T _{NT} - SD	T _{HT} (SD) => T _{HT} + SD	When measured	Overlap	T _{NT} >36°C throughout?
Bennett 1994	BT	36.4 (0.4) => 36.0	35.0 (0.4) => 35.4	End of surgery	NT distribution touching 36.0°C	Yes, but only 2 points
Casati 1999	PACU; HLoS	36.6 (0.4) => 36.2	35.7 (0.3) => 36.0	End of surgery	HT distribution touching 36.0°C, but paper reported 24% NT and 64% HT groups had T<36°C	Yes, graph shown
Fleisher 1998	PACU	36.8 (0.7) => 36.1	35.4 (0.7) => 36.1	'Post surgical'	Slight overlap in HT group	Yes, but only 2 points
Frank 1995	MV	36.7 (0.6) => 36.1	35.3 (0.6) => 35.9	PACU admission	No overlap	yes, but only 2 points
Frank 1997	MCE, MV, Mort, HLoS	36.7 (1.2) => 35.5	35.4 (1.3) => 36.7	PACU admission	Significant for both groups	Yes, but only 2 points
Johansson 1999	BT	36.3 (0.5) => 35.8	35.4 (0.5) => 35.9	Minimum temperature	Some overlap for NT group	Yes, 3 time points
Kurz 1996	SSI, BT	36.6 (0.5) => 36.1	34.7 (0.6) => 35.3	Final intraoperative	No overlap	Mostly, graph shown. Slightly < 36.0°C at 1h
Lenhardt 1997	BT, PACU	36.7 (0.6) => 36.2	34.8 (0.6) => 35.4	Final intraoperative	No overlap	Yes (stated in text), but data for 1 temperature only

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Study	Outcomes	T _{NT} (SD) => T _{NT} - SD	T _{HT} (SD) => T _{HT} + SD	When measured	Overlap	T _{NT} >36°C throughout?
Mason 1998	PACU	36.6 (0.5) => 36.1	35.7 (0.6) => 36.3	PACU admission	Some overlap for HT group (9% NT had HT and 34% HT had NT)	Yes, graph shown
Schmied 1996	BT	36.6 (0.4) => 36.2	35.0 (0.5) => 35.5	Final intraoperative	No overlap (1/30 HT in NT group, 2/30 NT in HT group)	Yes, but only 2 points
Scott 2001	PU	36.09 (ns)	35.70 (ns)	Lowest intraoperative	Unclear, but 7/9 PUs in NT group were hypothermic	Yes, probably, but only 2 points given
Smith 1998	PACU	36.3 (0.4) => 35.9	35.6 (0.4) => 36.0	Final temperature	Slight for NT group, HT distribution touching 36.0°C	Yes, graph shown
Smith 2007	PACU	36.4 (0.5) =>35.9	35.8 (0.6) => 36.4	Final temperature	Significant for HT group, slight for NT (HT group only 48% HT)	Yes, but only 3 points
Widman 2002	BT	36.2 (0.3) => 35.9 (calculated)	36.0 (0.4) => 36.4 (calculated)	End of surgery	Significant overlap in HT group, slight overlap in NT	Yes, graph shown for change in T
Winkler 2000	BT	36.5 (0.5) => 36.0	36.0 (0.4) => 36.4	Final core temperature	Significant overlap for HT group and NT distribution touching 36.0°C. 8/75 (HT) >36°C	Yes, but only average and final temperatures given
Zhao 2005	BT	36.4 (0.4) => 36.0	35.3 (0.5) => 35.8	End of surgery	NT distribution touching 36.0°C	Yes, graph shown

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Study	Outcomes	T _{NT} (SD) => T _{NT} - SD	T _{HT} (SD) => T _{HT} + SD	When measured	Overlap	T _{NT} >36°C throughout?
Sensitivity analyses						
Casati 1999	PACU, HLoS	36.6 (0.4) => 36.2	35.7 (0.3) => 36.0	End of surgery	Some overlap for NT group	Yes, borderline in places
Fleisher 1998	PACU	36.8 (0.7) => 36.1	35.4 (0.7) => 36.1	Post surgical	Significant overlap for NT group	Yes, but only 2 points
Frank 1995	MV	36.7 (0.6) => 36.1	35.3 (0.6) => 35.9	PACU admission	Significant overlap for NT group	yes, but only 2 points
Frank 1997	MCE, MV, Mort, LoS	36.7 (1.2) => 35.5	35.4 (1.3) => 36.7	PACU admission	Significant overlap for NT group, some overlap for HT group	Yes, but only 2 points
Kurz 1996	SWI, BT	Excluded from sensitivity analysis because TNT below 36.5°C at some point; No, TNT <36.5°C				
Lenhardt 1997	BT, PACU	36.7 (0.6) => 36.2	34.8 (0.6) => 35.4	Final intraoperative	Some overlap for NT group	Yes, but limited data
Mason 1998	PACU	Excluded from sensitivity analysis because TNT below 36.5°C at some point; No, TNT group <36.5°C				
Schmied 1996	BT	36.6 (0.4) => 36.2	35.0 (0.5) => 35.5	Final intraoperative	Some overlap for NT group	Yes, but only 2 points
Smith 1998	PACU	Excluded from sensitivity analysis because TNT below 36.5°C at some point; No, TNT group <36.5°C				
Winkler 2000	BT	36.5 (0.5) => 36.0	36.0 (0.4) => 36.4	Final core temperature	Significant overlap for the NT group	Yes, but only average and final temperatures given
Key: BT - blood transfusion; HLoS – hospital length of stay; MCE – morbid cardiac event; Mort – mortality; MV – mechanical ventilation; PACU – length of stay in PACU; PU – pressure ulcer; SWI – surgical wound infection						

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c) Cohort studies

Study	Outcome measurement	Representativeness	Cohort comparability	Patients per covariate	Source of population	Initial exposure	Loss to follow up	Sample size	Overall comments	Evidence quality
Surgical wound infection										
Flores Maldonado 2001; Prospective study	partly adequate (method described by name only)	somewhat representative of the community	Confounding possible: not enough patients for multivariate analysis	20/7 (=3)	Exposed /non-exposed from same cohort	Not possible to have outcome at start of study	Acceptable: ≤20% loss to follow up; 29/290 (10%) did not conclude the follow up	Not stated/unclear	Clean-contaminated surgery only. 4/8 important variables included. Not enough events for variables number. Used definition of Surgical Wound Taskforce no details + positive cultures. No infections at start of study	very low
Walz 2006; Retrospective study	adequate (acceptable details of SWI recording)	somewhat representative of the community	Acceptable: confounders taken into account in analysis (multivariate)	122/6 (=20)	Exposed /non-exposed from same cohort	Not possible to have outcome at start of study	Acceptable: ≤20% loss to follow up; 68/1472 not followed	Not stated/unclear	Not stated when or if all patient temperatures recorded. Some patients (3%) had current infection. Unexpected result for effect of perioperative antibiotics; not in line with Cochrane review. 5/8 important variables included. Good SSI monitoring.	very low

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Outcome measurement</i>	<i>Representativeness</i>	<i>Cohort comparability</i>	<i>Patients per covariate</i>	<i>Source of population</i>	<i>Initial exposure</i>	<i>Loss to follow up</i>	<i>Sample size</i>	<i>Overall comments</i>	<i>Evidence quality</i>
Morbid cardiac event										
Frank 1993; Prospective study	adequate (monitoring for MCE)	selected group eg specific operations	Confounding possible: not enough patients for multivariate analysis	21/14 (=2)	Exposed /non-exposed from same cohort	Some patients had outcome at start of study	Adequate: all patients followed up	Not stated/ unclear	21% had preoperative myocardial ischaemia Higher risk population. 7/8 important risk factors included, but events per variable too low. Adequate monitoring (Holter, ECG, Q-med monitors) and diagnosis by cardiologist (blinded)	very low
Blood transfusion intraoperatively										
Stapelfeldt 1996; Retrospective study	partially adequate (transfusion records retrospectively)	selected group eg specific operations	Confounding possible : not enough factors included	100/9 (=11)	Exposed /non-exposed from same cohort	Not possible to have outcome at start of study	Adequate: all patients followed up	Not stated/ unclear	Liver transplants; evidence limited and unclear because abstract. 3/6 important variables in analysis	very low

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<i>Study</i>	<i>Outcome measurement</i>	<i>Representativeness</i>	<i>Cohort comparability</i>	<i>Patients per covariate</i>	<i>Source of population</i>	<i>Initial exposure</i>	<i>Loss to follow up</i>	<i>Sample size</i>	<i>Overall comments</i>	<i>Evidence quality</i>
Blood transfusion intraoperatively										
Vorrakitpokatorn 2006; Prospective study	adequate (transfusion recorded)	somewhat representative of the community	Confounding possible: not enough patients for multivariate analysis	19/4 (=5)	Exposed /non-exposed from same cohort	Not possible to have outcome at start of study	Acceptable: ≤20% loss to follow up; Not all patients followed up for this outcome. Paper reports 16/119 (rather than 128), ie. 9/128 not	Not stated/unclear	Insufficient variables for number of events. 3/6 important variables included	low
Blood transfusion postoperatively										
Vorrakitpokatorn 2006; Prospective study	adequate (transfusion recorded)	somewhat representative of the community	Confounding possible: not enough patients for multivariate analysis	26/5 (=5)	Exposed /non-exposed from same cohort	Not possible to have outcome at start of study	Not stated; May be some loss to follow up for this outcome but not more than 20%	Not stated/unclear	Insufficient variables for number of events. 4/6 important variables included. About half the patients had sepsis postoperatively	low
ICU length of stay										
Abelha 2005; Prospective study	unclear (LoS recorded)	somewhat representative of the community	Confounding possible: not enough patients for multivariate analysis	47/9 (=5)	Exposed/non-exposed from same cohort	Not possible to have outcome at start of study	Adequate: all patients followed up;	Not stated/unclear	3/7 vital variables in analysis	low

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

Study	Outcome measurement	Representativeness	Cohort comparability	Patients per covariate	Source of population	Initial exposure	Loss to follow up	Sample size	Overall comments	Evidence quality
Death										
Abelha 2005; Prospective study	adequate (death recorded)	somewhat representative of the community	Confounding possible: not enough patients for multivariate analysis	14/8 (=2)	Exposed /non-exposed from same cohort	Not possible to have outcome at start of study	Adequate: all patients followed up;	Not stated/unclear	Too few events for multivariate analysis. 2/6 important factors included in analysis	very low
Bush 1995; Prospective and retrospective study	adequate (death recorded)	selected group eg specific operations	Confounding possible: not enough patients for multivariate analysis	11/4 (=3)	Exposed /non-exposed from same cohort	Not possible to have outcome at start of study	Adequate: all patients followed up;	Not stated/unclear	Aortic aneurysm repairs. IPH not included in mortality directly. Unclear how many variables. 3/6 important variables included or held constant. ICU stay depended on bed availability - may affect mortality	very low
Janczyk 2004; Retrospective study	adequate (death recorded)	selected group eg specific operations	Confounding possible: not enough patients for multivariate analysis	47/10 (=5)	Exposed /non-exposed from same cohort	Not possible to have outcome at start of study	Not stated;	Not stated/unclear	Emergency aortic aneurysm repairs. One hospital. Unclear how cohort selected or how temperature recorded. 4/6 important variables included or held constant	very low

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Outcome measurement</i>	<i>Representativeness</i>	<i>Cohort comparability</i>	<i>Patients per covariate</i>	<i>Source of population</i>	<i>Initial exposure</i>	<i>Loss to follow up</i>	<i>Sample size</i>	<i>Overall comments</i>	<i>Evidence quality</i>
Hospital length of stay										
Bush 1995; Prospective study	partially inadequate (LoS may be affected by confounders)	selected group eg specific operations	Confounding possible: not enough patients for multivariate analysis	/3 (=)	Exposed /non-exposed from same cohort	Not possible to have outcome at start of study	Adequate: all patients followed up;	Not stated/ unclear	Aortic aneurysm repairs. Unclear how many variables and how many events. 4/5 important variables included in analysis or held constant. ICU stay depended on bed availability - may affect HLoS	very low
Selldén 1999; Prospective study	unclear (LoS recorded)	somewhat representative of the community	Fairly acceptable: multivariate analysis with nearly enough patients (8-10 per covariate)	75/8 (=9)	Exposed /non-exposed from same cohort	Not possible to have outcome at start of study	Adequate: all patients followed up;	No	Patients selected from two trials not from a single cohort. 3/5 important variables included or held constant.	Low/moderate
Vorrakitpokatorn 2006; Prospective study	unclear (LoS recorded)	somewhat representative of the community	Fairly acceptable: multivariate analysis with nearly enough patients (8-10 per covariate)	57/7 (=8)	Exposed /non-exposed from same cohort	Not possible to have outcome at start of study	Acceptable: ≤20% loss to follow up; Not all patients followed up for this outcome. Paper reports 11/128 not followed	Not stated/ unclear	3/5 important variables included or held constant	Low/moderate

D4: PREOPERATIVE WARMING DEVICES

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Camus 1995	Adequate; random numbers table	Unclear	Not stated; shivering was the only outcome that was blinded	Not stated	Unclear	Unclear	Not stated	Yes mainly; age, weight, height, initial core temperature. Preoperative ambient temperature higher in pre-warmed group.
Fossum 2001	Adequate; sealed packets with red or blue dots shuffled	Partial; sealed packets	Not stated	Not stated	Yes	Unclear	Not stated	Yes mainly; age, gender, type of surgery, ASA, initial temperature. Not stated: weight or BMI
Horn 2002	Adequate; computer generated	Partial; sequentially numbered opaque enveloped (not stated if sealed)	Not stated	Not stated	Yes	Unclear	Yes	Yes; comparable on age, weight, height, duration of surgery
Just 1993	Unclear	Unclear	Not stated; only shivering evaluated by a blinded observer	Not stated	Unclear	Unclear	Not stated	Yes; comparable on age, weight, height, or temperature, duration of surgery, volume of IV fluids, basal core temperature and administered opioids

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

Study	Sequence Generation	Allocation Concealment	Outcome Assessor blinded	Patient Blinding	Attrition	Itt?	Power calculation	Baseline comparable
Melling 2001	Partial; randomised in blocks of 90	Partial; opaque envelopes	Not stated; blinding of outcome assessor at 2 to 6 weeks for wounds; but unclear re: measuring core temperature	Not stated	No (20% dropouts)	Yes	Yes	Yes; comparable on age, gender, BMI, type of surgery, prior surgery, initial core temperature, length of surgery, prophylactic abs, preoperative fasting, preoperative shaving, cancer diagnosis, seniority of surgeon
Sheng 2003 (1)	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; groups comparable on height, weight and age.
Sheng 2003 (2)	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes mainly; groups matched in height, weight, age. But more women than men in treatment group

D5: INTRAOPERATIVE WARMING DEVICES

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Baxendale 2000	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	No	Yes, but limited data; the authors reported groups were comparable in respect of age, BMI, intraoperative fluid requirements and duration of surgery
Bennett 1994	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes mainly; comparable in age, gender, body weight, height, OR temperature
Berti 1997	Partial; randomisation table	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; comparable on age, weight, height, duration of surgery, fluid infused
Borms 1994	Unclear	Unclear	Not stated	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, gender, weight, kg, end-tidal isoflurane concentration, ambient temperature

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

Study	Sequence Generation	Allocation Concealment	Outcome Assessor blinded	Patient Blinding	Attrition	Itt?	Power calculation	Baseline comparable
Bourke 1984(study 1)	Unclear	Unclear	Not stated; nurse blinded to treatment assessed shivering in recovery room	Not stated	Unclear	Unclear	Not stated	Yes, but limited data; authors stated that patients comparable on age, weight, body surface area, ASA class, preoperative erative meds, anaesthetic technique, or room temperature , humidity. Numbers not provided.
Bourke 1984(study 2)	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes, but limited data; authors reported that there were no differences with respect to patient population, or environment or anaesthetic technique. Numbers not provided.
Camus 1993a	Unclear	Unclear	Not stated; shivering evaluated by an independent observer blinded to the treatment	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, gender, weight, height, basal core temperature, or temperature, duration of anaesthesia, total dose of fentanyl, and infused fluids

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Camus 1993b	Unclear	Unclear	Not stated; shivering evaluated by an independent observer blinded to the treatment	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, gender, weight, height, basal core temperature, or temperature, duration of anaesthesia, total dose of fentanyl, and infused fluids
Camus 1997	Unclear	Unclear	Not stated; observer blinded to treatment assessed shivering	Not stated	Yes	Unclear	Not stated	Yes; comparable in age, weight, initial core temperature, duration of anaesthesia, OR temperature, IV fluids volume
Casati 1999	Unclear	Partial; sealed envelopes	Not stated; observer blinded to treatment assessed shivering, ponv and other undesirable side effects	Not stated	Yes	Unclear	Yes	Yes; age, weight, height, ASA, duration of surgery, blood loss, fluid infused and urine output
Dyer 1986	Unclear	Unclear	Not stated	Not stated	No ($\leq 20\%$ dropouts)	No	Not stated	Yes; comparable on age, weight, resection time, theatre temperature, spinal height, volume of infused fluids

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Erickson 1991	Adequate; random number tables	Unclear	Not stated	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, gender, BMI, duration of surgery, volume of infused fluids
Frank 1995	Unclear; stratified on type of surgery	Unclear	Not stated	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, gender, height, weight, history of hypertension, diabetes, surgical procedures, anaesthetic types, preoperative beta-blocker
Frank 1997	Adequate; computer generated randomization sequence	Partial; opaque sealed envelope	Not stated	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, gender, weight, height, ASA status, type of surgical procedure, history of MI and related cardiac, BP, diabetes, renal failure, preoperative erative medications
Harper 2007	Unclear	Inadequate; sealed envelopes	No single blind	No single blind	Yes	Yes	Not stated	Yes, but limited data; comparable on age, ASA status, volume of infused fluids.

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Hindsholm 1992	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Yes	Yes; comparable in age, weight, height, same anaesthetic technique, blood loss, infusion requirements, blood transfusions.
Hofer 2005	Adequate:	Unclear	Not stated	Not stated			Not stated	Yes; comparable in age,
Hoyt 1993	Adequate; coin toss	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes, but limited data; comparable on age, weight and height.
Hynson 1992	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; groups comparable on age, weight, height, BSA, IV fluid

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Joachimsson 1987	Unclear	Unclear	Not stated	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, gender, weight, duration of surgery, room temperature, humidity, pre-induction temperature
Johansson 1999	Unclear	Adequate; sequentially numbered opaque sealed envelopes	No not blinded	No not blinded	No ($\leq 20\%$ dropouts)	Unclear	Yes	Yes; comparable on age, gender, weight, height, preoperative haemoglobin, pre-medication, fluids
Kabbara 2002	Adequate; computer generated random numbers table	Unclear; states 'sealed envelopes not used'	Not stated	Not stated	No ($\leq 20\%$ dropouts)	No	Yes	Yes mainly; comparable on age, weight, ASA status, anaesthesia time, surgery time, fluid balance. Significantly different in gender distribution. More women in usual care group. Significantly different in height.

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Kamitini 1999	Unclear	Unclear	Not stated	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, height, weight, ASA status, duration of surgery, dose of ephedrine, volume of infused fluids
Krenzischek 1995	Unclear	Partial; sealed opaque	Not stated	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, gender, preoperative core temperature, weight, height, anaesthetic technique
Kurz 1995	Adequate; computer generated random numbers table	Unclear	Not stated; qualitative assessment made by an observer blinded to the patient(s)' group assignment and ct;	Not stated	Unclear	Unclear	Not stated	Yes; comparable on age, weight, height, gender, duration of surgery, IV fluids, administered fentanyl, end-tidal isoflurane

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

Study	Sequence Generation	Allocation Concealment	Outcome Assessor blinded	Patient Blinding	Attrition	Itt?	Power calculation	Baseline comparable
Kurz 1996	Adequate; computer generated	Partial; numbered sealed opaque envelopes (does not state if sequentially numbered)	Yes double blind; surgeons, or personnel and patient(s) not aware of FAW and fluid heater settings	Yes double blind	Yes	Yes	Yes	Yes; comparable on age, weight, height, gender, duration of surgery, IV fluids, administered fentanyl, end-tidal isoflurane
Kurz 1993a	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; comparable in age, weight, height, infused volume, gender
Kurz 1993b	Unclear	Unclear	No not blinded	No not blinded	Unclear	Unclear	Not stated	Yes, but limited data; comparable on age, weight, height
Lee 2004	Adequate; random numbers table	Partial; opaque envelopes	Not stated	Not stated	Yes	Unclear	Yes	Yes; comparable on age, gender, BMI, duration of surgery
Lenhardt 1997	Adequate; computer generated random codes	Partial; sealed and numbered opaque envelopes	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes; comparable on age, weight, height, gender, preoperative core temperature, duration of surgery

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Leung 2007	Adequate; drawing lots	Unclear	Not stated	Not stated	Unclear	Unclear	Yes	Yes; comparable on age, BMI, preoperative temperature, duration of anaesthesia, surgery
Lindwall 1998	Unclear	Unclear	Not stated	Not stated	Yes	Unclear	Not stated	Yes, but limited data; comparable on age, ASA, weight, duration of operation, baseline core temperature
Mason 1998	Adequate; computer generated	Partial; numbered, sealed, opaque envelopes	Not stated; blinding for pacu observations (criteria for discharge, shivering) unaware of group assignment	Not stated	Unclear	Unclear	Not stated	Yes; matched on age, gender, weight, height, or temperature , PACU temperature , duration of surgery volume of IV fluid, duration of anaesthesia
Matsukawa 1994	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; comparable: age, gender, height, weight, duration of surgery, room temperature
Matsuzaki 2003	Partial; computer-generated codes	Partial; sequentially numbered opaque envelopes	No not blinded	No not blinded	Yes	Yes	Not stated	Yes; comparable on age, gender, weight, BMI, preoperative core temperature

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Mogera 1997	Inadequate; patients randomised after establishment of balanced anaesthesia	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; comparable on age, gender, weight, height, duration of anaesthesia, volume of infused fluids
Motamed 2000	Partial; computer-generated list of random numbers	Unclear	Not stated	Not stated	Yes	Unclear	Yes	Yes; comparable in age, sex, weight, height, duration of surgery and anaesthesia, room temperature
Muller 1995	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes, but limited data; comparable on age, weight, height
Negishi 2003	Adequate; computer generated codes	Adequate; sequentially numbered opaque envelopes	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; age, sex, weight, BMI, surgical duration, ambient temperature, SpO ₂ , mean arterial pressure
Ng 2006	Adequate; drawing lots	Unclear	Not stated	Not stated	Yes	Unclear	Yes	Yes; comparable on age, gender, BMI, preoperative core temperature, duration of surgery, duration of tourniquet, duration of anaesthesia, volume of infused fluids

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Ouellette 1993	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; comparable on age, weight, fluids, anaesthesia time
Radel 1986	Unclear	Unclear	Not stated	Not stated	Yes	Unclear	Not stated	Yes, but limited data; authors reported patients had similar demographics.
Radford 1979	Unclear	Unclear	Not stated	Not stated	Unclear	No	No	Yes, but limited data; sex, age, theatre temperature, intracranial pathology, use of halothane and tirmtaphan.
Rasmussen 1998	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; comparable on age, weight, height, BMI, gender, IV fluids used, fluid balance, RT or cvp.
Russell 1995	Unclear	Partial; sealed envelopes	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; comparable on age, sex, height, weight, blood transfused and duration of surgery

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Scott 2001	Partial; block randomisation system	Partial; opaque envelopes	Not stated; outcome assessors assessing pressure ulcers blinded to treatment	Not stated	Yes	Yes	Yes	Yes; comparable on age, gender, BMI, preoperative temperature, type of anaesthetic, ASA status, surgical category, oral steroids, peripheral vascular disease, heart disease, diabetes, tobacco use.
Sheng 2003 (1)	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; groups comparable on height, weight and age.
Smith 1994	Adequate; computer generated random number sequence	Unclear	Not stated; presence or absence of shivering	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, gender, weight, height, ASA, duration of surgery, body surface area
Smith 1994a	Adequate; computer generated random number sequence	Unclear	Not stated; presence or absence of shivering	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, gender, weight, height, ASA, duration of surgery, body surface area

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

Study	Sequence Generation	Allocation Concealment	Outcome Assessor blinded	Patient Blinding	Attrition	Itt?	Power calculation	Baseline comparable
Tølløfsrud 1984a	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes, but limited data; comparable on age, weight
Tølløfsrud 1984b	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes, but limited data; comparable on age, weight
Torrie 2005	Adequate; random number table	Partial; opaque envelopes	Not stated	Not stated	No ($\leq 20\%$ dropouts)	No	Yes	Yes; comparable on age, BMI, initial oral temperature, block height, sedation, volume of irrigation fluid, duration of surgery
Whitney 1990	Adequate; random numbers table	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; age, weight, height, baseline core temperature, mean volume of IV fluid infused during 1 st hour, mean time from induction to skin incision, mean time from skin incision to peritoneal incision

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

Study	Sequence Generation	Allocation Concealment	Outcome Assessor blinded	Patient Blinding	Attrition	Itt?	Power calculation	Baseline comparable
Winkler 2000	Adequate; computer generated random numbers table	Partial; sealed envelopes	Not stated; observations weighing gauze sponges and calculating blood recovered by rbc scavenging system blinded to group assignment	Not stated	Yes	Yes	Yes	Yes; comparable on age, gender, weight, height, ASA physical status, duration of surgery, patients with or without CV disease under or over 65 years of age.
Wong 1997	Adequate; computer generated random numbers	Partial; sealed opaque envelopes	Not stated; blinded for assessment of surgical wounds and complications daily during hospitalization and 6-8wks post	Not stated	Yes	Yes	Yes	Yes mainly; comparable on age, gender, BMI, ASA, duration of surgery, IV fluids
Yamakage 1995	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes, but limited data; comparable in age, gender, weight, height

D6: PRE AND INTRA OPERATIVE WARMING DEVICES

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Bock 1998	Unclear	Unclear	Not stated; independent anaesthetist assessed blood loss; anaesthetist blinded to treatment assessed shivering in pacu	Not stated	Yes	No	Not stated	Yes; comparable on age, gender, height, weight, length of operation, intraoperative fluid volume, fentanyl dose
Buggy 1994	Unclear	Unclear	Nursing staff blinded to intervention; assessed shivering		Yes	Unclear	Not stated	Yes, but limited data; age, gender, duration of surgery - comparable
Horn 2002	Adequate; computer generated	Partial; sequentially numbered opaque enveloped (not stated if sealed)	Not stated	Not stated	Yes	Unclear	Yes	Yes; comparable on age, weight, height, duration of surgery
Janiciki 2001	Unclear	Unclear	Not stated	Not stated	Yes	Unclear	Yes	Yes; comparable on age, weight, height

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Janiciki 2002	Adequate; computer generated	Unclear	Not stated	Not stated	Yes	Unclear	Yes	Yes; comparable on age, weight, height
Wong 1997	Adequate; computer generated random numbers	Partial; sealed opaque envelopes	Not stated; blinded for assessment of surgical wounds and complications daily during hospitalization and 6-8 weeks post	Not stated	Yes	Yes	Yes	Yes mainly; comparable on age, gender, BMI, ASA, duration of surgery, IV fluids
Wongorasartuk 1998	Unclear	Unclear	Not stated	Not stated	No (20% dropouts)	No	Yes	Yes; comparable in age, weight, height, duration of surgery, baseline temperature

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

D7: INTRAOPERATIVE PHASE: FLUID WARMING

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Camus 1996	Unclear	Unclear	Not stated; shivering evaluated at 5-min interval by an independent observer blindd to the treatment.	Not stated	Unclear	Unclear	Not stated	Yes; comparable on age, sex, weight, height, OR temperature, duration of anaesthesia, volume of infused fluids, infusion rate & dose of anaesthesia
Cooper 1994	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Not stated
Dyer 1986	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; comparable on age, weight, theatre temp, and volume of infused fluids, spinal height and resection time.
Ellis-stoll 1996	Unclear	Unclear	Not stated	Not stated	No ($\leq 20\%$ dropouts)	No	No	Not stated; study reported the groups did not differ significantly in any demographic factors and comparable surgical time

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

Study	Sequence Generation	Allocation Concealment	Outcome Assessor blinded	Patient Blinding	Attrition	Itt?	Power calculation	Baseline comparable
Hasankhani 2005	Partial; coin toss	Unclear	Not stated; post-operative data assessed by nurse unaware of treatment group	Not stated	No ($\leq 20\%$ dropouts)	Unclear	Not stated	Yes; comparable on age, sex, weight, height, duration of surgery, infused fluids, or temperature
Jaffe 2001	Unclear	Unclear	Yes double blind	Yes double blind	Unclear	Unclear	Not stated	Yes, but limited data; comparable on age, time in or, baseline core temperature, volume of infused fluids
Kelly 2000	Adequate; random numbers table	Unclear	Not stated	Not stated	No ($\leq 20\%$ dropouts)	No	Not stated	Yes, but limited data; comparable on age, weight, gender surgical time, volume of IV fluids, volume of irrigation fluids
Kurz 1996	Adequate; computer generated	Partial; numbered sealed opaque envelopes (does not state if sequentially numbered)	Yes double blind; surgeons, or personnel and pts not aware of FAW and fluid heater settings	Yes double blind	Yes	Yes	Yes	Not stated

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Monga 1996	Unclear	Unclear	Not stated	Not stated	Yes	Unclear	Not stated	Not stated; study did report that patients receiving warmed irrigation fluids were older than those receiving cold fluids (73.4 vs 67.5years; p=0.004)
Moore 1996	Partial; table of random numbers	Unclear	Not stated	Not stated	No (≤ 20% dropouts)	No	Not stated	Yes mainly; comparable on age, BMI, OR temp, total IV, CO ₂ used to maintain pneumoperitoneum, length of anaesthesia & surgery sig diff in volume of irrigation fluids.
Motamed 1998	Unclear	Unclear	Yes double blind; does not provide any additional expect those assigned to 'measure outcome were not aware of group	Yes double blind	Unclear	Unclear	Not stated	Yes; comparable of age, gender, height, duration of surgery, blood loss, IV fluids, intraoperative anaesthesia; weight greater in control; post-operative bupivacaine more in control group

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Muth 1996	Inadequate; patients' day of surgery; i.e. Odd or even number	Unclear; likely to be inadequate	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; comparable on age, weight, height, duration of surgery, total fluid replacement
Patel 1996	Partial; random numbers table	Unclear	No not blinded; assessed by nurse blinded to treatment group.	No not blinded	No ($\leq 20\%$ dropouts)	Unclear	Not stated	Yes mainly; comparable on height, weight, ASA, gender; but flotem patients younger than hotline group
Patel 1997	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes mainly
Pit 1996	Unclear	Unclear	Yes single blind; pt unaware of treatment until post-operative	Yes single blind	Yes	Unclear	Not stated	Yes, but limited data; age
Schmeid 1996	Partial; computer generated code	Partial; sequentially numbered opaque envelopes	Not stated	Not stated	Unclear	Yes	Yes	Yes; comparable on age, weight, gender, height, duration of surgery, isoflurane, mean arterial BP, heart rate, end tidal PCO ₂ .

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Smith 1998	Unclear	Unclear	Not stated; post-operative data recorded by PACU nurse blinded to treatment	Not stated	Yes	Unclear	Not stated	Yes; age, weight, height, anaesthesia time, blood loss, room temperature, surgery time
Smith 1998b	Adequate; random numbes table	Unclear	Not stated	Not stated	No ($\leq 20\%$ dropouts)	Yes	No	Yes; age, gender, height, weight, duration of anaesthesia & surgery longer in the FAW+warmed fl;
Steinbrook 1997	Partial; coin toss	Unclear	Not stated	Not stated	No ($\leq 20\%$ dropouts)	No	Not stated	Yes; comparable on age, weight, total-body O ₂ consumption, opioids;
Zhao 2005	Unclear	Unclear	Not stated; shivering evaluated by an independent observer blinded to treatment	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, body weight, duration of surgery and volume of IV

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D8: INTRAOPERATIVE PHASE: GASES

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Bäcklund 1998	Unclear	Unclear	Not stated; blinded to pneuoperitoneum temp assessed post-operative pain	Not stated	Unclear	Unclear	Not stated	Yes; comparable on age, weight, BMI, gender, duration of operation, volume of infused fluids; significantly higher volume of insufflated CO ₂ in control group; & lower number of patients given mannitol
Champion 2006	Unclear	Unclear	Yes double blind; nurses blinded to allocation recorded the subjective pain score	Yes double blind	Yes	Unclear	Not stated	Yes, but limited data; age, sex, BMI,
Conahan 1987	Unclear	Unclear	Not stated; nurse unaware of treatment a patient had received; assessed shivering and patient's perception of cold	Not stated	Unclear	Unclear	Not stated	Yes, but limited data; comparable mainly on age, weight, anaesthesia time, or temperature, recovery room temperature

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Study	Sequence Generation	Allocation Concealment	Outcome Assessor blinded	Patient Blinding	Attrition	Itt?	Power calculation	Baseline comparable
Eckerrbom 1990	Unclear	Unclear	No not blinded	No not blinded	Unclear	Unclear	Not stated	Yes, but limited data; comparable on age, body weight, ventilation(l/min)
Farley 2004	Partial; computer model	Unclear	Yes double blind; all personnel blinded to treatment.	Yes double blind	No (\leq 20% dropouts)	No	Yes	Yes, but limited data; age, gender, BMI, pts w/LAD, COPD, MI
Goldberg 1992	Adequate; computer generated random table	Unclear	Not stated; assessing sublingual temp, shivering, perception of cold	Not stated	Yes	Unclear	Not stated	Yes; comparable on age, ASA, weight, duration of surgery, fluids, amount of IV anesthetics administered, OR and PACU temp
Hamza 2005	Adequate; computer generated random numbers	Unclear	Yes double blind; 2 pts in control grp excl from analysis as FAW applied	Yes double blind	No (\leq 20% dropouts)	No	Yes	Yes; comparable on age, weight, gender, anaesthesia, time, surgery time, insufflation time, IV and irrigation fluids, urine output, OR and PACU temp and humidity

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Hynson 1992	Unclear	Unclear	Not stated	Not stated	Yes	Yes	Not stated	Yes; comparable on age, weight, height, bsa, gender, volume of IV fluids, ambient temperature
Johansson 2003	Unclear	Unclear	No not blinded	No not blinded	Yes	Unclear	Not stated	Yes, but limited data; comparable on age, weight and gender
Mouton 1999	Unclear	Unclear	Not stated	Not stated	Yes	Unclear	Not stated	Not stated; paper reported that there was no difference in terms of age, gender, previous abdominal surgery, intraoperative analgesics& narcotics.
Nelskylä 1999	Unclear	Unclear	Yes double blind	Yes double blind	No (≤ 20% dropouts)	No	Not stated	Yes; comparable on age, weight, duration of surgery & anaesthesia, volume of insufflation & irrigation gas, time from induction of anaesthesia to start of surgery

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Nguyen 2002	Unclear	Partial; sealed envelopes	Not stated	Not stated	Unclear	Unclear	Yes	Yes; comparable on age, gender, volume of gas, duration of surgery, baseline core temperature
Ott 1998	Unclear	Unclear	Yes double blind	Yes double blind	Unclear	Unclear	Not stated	Not stated; stated no statistically significant diff between groups in demographic info.
Saad 2000	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Yes	Yes; comparable on age, gender, weight, height, duration of surgery, volume of gas, baseline core temperature, volume of rinse solution

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Savel 2005	Unclear	Unclear	Yes double blind; all clinicians blinded to group assignment.	Yes double blind	Unclear	Unclear	Yes	Yes mainly; comparable in age, gender, BMI, preoperative core temperature, medical co-morbidities (incl diabetes, hypertension, known CAD, obstructive sleep apnea); duration of surgery longer in usual care group
Slim 1999	Partial; random numbers	Partial; sealed envelopes	Yes double blind	Yes double blind	No (\leq 20% dropouts)	Unclear	Yes	Yes; comparable on age, gender, BMI, type of surgery, duration of procedure, volume of gas
Stone 1981	Unclear	Unclear	No not blinded	No not blinded	Yes	Unclear	Not stated	Yes, but limited data; group comparable age, weight, ASA, preoperative temperature,

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Tølløfsrud 1984a	Unclear	Unclear	No not blinded	No not blinded	Yes	Unclear	Not stated	Not stated
Tølløfsrud 1984b	Unclear	Unclear	No not blinded	No not blinded	Yes	Yes	Not stated	Not stated
Wills 2001	Adequate; random number table	Adequate; sequentially numbered opaque sealed envelopes	Yes double blind; pain	Yes double blind	No ($\leq 20\%$ dropouts)	Unclear	Yes	Yes, but limited data; comparable on age, gender, BMI
Youngberg 1985	Unclear	Unclear	No not blinded	No not blinded	Unclear	Unclear	Not stated	Not stated

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D9: PHARMACOLOGICAL AGENTS -PREVENTION

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Ikeda 1999	Adequate; computer-generated codes	Unclear; not stated	Yes single blind	Yes single blind	Yes	Yes	Not stated	Yes
Mizobe 2006	Adequate; computer generated	Partial; sealed envelopes	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Mohamed 2005	Unclear; not stated	Unclear; not stated	Not stated	Not stated	Yes	Yes	Not stated	Yes
Piper 2000	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes
Piper 2001	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Sahin 2002	Unclear; not stated	Unclear; not stated	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Sellden 1994	Quasi-randomised (alternate)	Inadequate	Yes double blind	Yes double blind	Yes	Yes	Not stated	Yes
Sellden 1996	Unclear; groups a and c apparently randomised; group b added later (not randomised)	Unclear; not stated	No not blinded	No not blinded	Yes	Yes	Not stated	Yes
Sellden 1999	Inadequate; alternate	Unclear; not stated	No not blinded	No not blinded	Yes	Yes	Not stated	Yes
Umenai 2006	Adequate; computer generated	Partial; sealed envelopes	Yes double blind	Yes double blind	No (>20% dropouts)	Yes	Yes	Yes
Widman 2002	Unclear; not stated	Adequate; sealed envelopes	Yes double blind	Yes double blind	Yes	Yes	Yes	Yes

D10: TREATMENT: WARMING DEVICES

<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Alfonsi 2003	Adequate; computer generated codes	Partial; sequentially numbered, opaque envelopes	No not blinded; outcome assessor blinded for shivering, not for pain and cold	No not blinded	Yes	Yes	Yes	Yes; comparable: age, height, weight, operation type, surgery duration, anaesthetic, intraoperative CV response, core temperature at end of surgery, ambient temperature
Bräuer 2004 (indirect)	Unclear	Unclear	Not stated; assessor probably not blinded. Patient may be blinded for some outcomes because sedated.	Not stated	Yes	Yes	Not stated	Yes; comparable for age, gender, weight, height, infusions, sedation and meperidine. Initial temperature not stated.
Bredahl 1995	Unclear	Unclear	No not blinded; probably not blinded. Measurements every 15 min	No not blinded	Yes	Yes	Yes	Yes; comparable for: age, gender, weight, anaesthetic type (general/regional); PACU temperature; operation site; duration of surgery, IV infusions, and initial temperature.

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Giuffre 1991	Adequate; shuffled piles of envelopes; stratified by gender	Unclear	No not blinded; assessor probably not blinded	No not blinded	Yes	Yes	Not stated	Yes; comparable for age, gender, admitting temperature, duration of anaesthesia, volume intraoperative fluid.
Hershey 1997	Adequate; random number table	Unclear; investigator opened an envelope, but possible 3rd party randomised	No not blinded; outcome assessor also opened envelopes	No not blinded	No ($\leq 20\%$ dropouts)	Unclear	Yes	Yes, but limited data; comparable for age, presence of endotracheal tube, admission BP. Not comparable for time in or (group 3 mean 184min, group 2: 233min; group 1: 201min)
Jackson 1997	Unclear	Unclear	No not blinded; investigators stated not to be blinded	No not blinded	Yes	Yes	Not stated	Yes, but limited data; comparable for age, gender, admission core temperature
Karayan 1996	Unclear	Unclear	Not stated	Not stated	Unclear	Unclear	Not stated	Yes; comparable in age, duration of anaesthesia, duration of surgery, blood loss, infused volume of solutions, OR temperature

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Lennon 1990	Unclear	Partial; sealed envelope	No not blinded	No not blinded	Yes	Yes	Not stated	Yes, but limited data; comparable for age, height, weight, oral temperature on admission to recovery room.
Stevens 2000	Inadequate; 1st patient by coin flip, then alternation	Inadequate; alternation	Not stated; assessor unlikely to be blinded	Not stated	No ($\leq 20\%$ dropouts)	Unclear	Not stated	Yes mainly; comparable for: age, gender, length of operation, use of muscle relaxants, use of warmed IV fluids. Not comparable for proportion of orthopaedic patients (more in control group: 3.6 vs 13.2%).
Summers 1990	Adequate; coin toss	Unclear	No not blinded; assessors unlikely to be blinded	No not blinded	Yes	Yes	Not stated	Yes mainly; similar for age, gender, OR temperature. Not comparable for length of time in OR (bair hugger longer by 35 min; significant difference in temperature on arrival in PACU (0.38°C lower for intervention)

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<i>Study</i>	<i>Sequence Generation</i>	<i>Allocation Concealment</i>	<i>Outcome Assessor blinded</i>	<i>Patient Blinding</i>	<i>Attrition</i>	<i>Itt?</i>	<i>Power calculation</i>	<i>Baseline comparable</i>
Vanni 2003	Unclear	Partial; sealed envelope	Not stated; blinding for shivering in post-operative period	Not stated	Unclear	Unclear	Not stated	Yes; comparable: age, weight, height, BMI, core body temperature, preinduction or temperature, final or temperature, duration of surgery and volume of IV fluids.
Weyland 1994	Unclear	Unclear	No not blinded; unlikely to be blinded	No not blinded	Yes	Yes	Not stated	Yes; comparable for: age, gender, weight, height, volume of infusions given post-operative, intraoperative amount of opioids and sedatives, post-operative total dose of propofol; initial temperature not stated

APPENDIX E: EXCLUDED STUDIES - TABLES AND REFERENCES

E1: RISK FACTORS

Study	Reason for exclusion
Abd El-Hakeem 2003	Indirect population: patients had undergone cardiopulmonary bypass under therapeutic hypothermia
Baxendale 1994	Shivering only outcome measure
Beaussier 1998	Not intervention under study
Bernard 1998	Not surgery
Bilotta 2001	Not IPH
Caverni 2005	Not measuring core temperature
Chen 1991	Shivering only outcome measure
de Witte 1996	Not intervention under study
Generali 2005	Review not primary data
Hartley 1989	Not measuring core temperature
Harwood 1995	Not intervention under study
Holm 1997	Not IPH

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Study	Reason for exclusion
Horn 1999	Not IPH
Khosravi 2002	Not measuring core temperature
Kranke 2004	Review not primary data
Kudoh 2004	Not RCT
Kurz 1997	Healthy subjects
Launo 2004	Not measuring core temperature
Nicolaou 1997	Volunteers
Quintin 1991	Not intervention under study
Sevarino 1989	Indirect population: pregnant women undergoing Caesarean section
Vogelsang 1989	Not measuring core temperature

E2: CONSEQUENCES OF INADVERTENT PERIOPERATIVE HYPOTHERMIA

Study	Outcome	Reason for exclusion
Barone 1999	BT; SWI; Mort; postoperative HLoS	Retrospective cohort study with no multivariate regression to adjust for confounding variables.
Bernabei 1992	Mortality	Cohort study with multivariate regression but not for relevant outcomes (including mortality).
Bock 1998	MV; BT; PACU	RCT. Unclear if 'normothermic' group mean went below 36.0°C because baseline mean not given (although range was 36.5 to 37.5°C and maximum drop was about 1°C)
Bush 1995 [†]	ICU; HLoS; mort	Cohort study. Included for mortality and length of stay but no multivariate analysis for morbid cardiac events. Hypothermia threshold 34.5°C
Champion 2006	HLoS, PACU	RCT. Mean core temperature was above 36.0°C for 'hypothermic' group at both times given
Conahan 1987	PACU	RCT. Mean core temperature was below 36.0°C for 'normothermic' group on arrival in PACU.
Cory 1998	PACU	Cohort study with no multivariate regression to account for confounding variables. Study sample included children.
Edwards 2003	SSI	Population undergoing Caesarean section

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Study	Outcome	Reason for exclusion
Farley 2004	PACU; HLoS	RCT. Mean core temperature was below 36.0°C for 'normothermic' group on arrival in PACU.
Gentilello 1997	BT; Mort; HLoS; MV; ICU	RCT. Mean core temperature was below 36.0°C for both groups at baseline and not all had surgery.
Guest 2004	BT; SWI	Cohort study with correlations to the outcomes; multivariate analysis confined to complications generally
Hamza 2005	PACU; HLoS	RCT. Mean core temperature was below 36.0°C for 'normothermic' group intraoperatively
Heathcote 1986	BT	Non-randomised comparative study; no temperatures reported
Hohn 1998	BT	Indirect population, therapeutic hypothermia; warming post-cardiopulmonary bypass; not considered to be generalisable
Hofer 2005	BT	RCT. Mean core temperature was below 36.0°C for 'normothermic' group intraoperatively
Janczyk 2004 [†]	BT	Retrospective cohort study. Included for mortality but there was no multivariate analysis for blood transfusion outcome.
Leung 2007	BT	RCT. Mean core temperature was below 36.0°C for 'normothermic' group intraoperatively
Melling 2006	SWI	RCT. Mean core temperature was above 36.0°C for 'hypothermic' group at both times given

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Study	Outcome	Reason for exclusion
Nathan 2004	BT; MCE; SWI; ICU; Mort; MV; HLoS	RCT. Population had cardiopulmonary bypass with cold cardioplegia and study group had active cooling. Not considered to be generalisable.
Nguyen 2002	HLoS	RCT. Mean core temperature was below 36.0°C for both groups at baseline.
Panagiotis 2005	PACU	Cohort study. No multivariate analysis
Paterson 1999	ICU; BT	Cohort study, No multivariate analysis except for cytomegalovirus reactivation infections
Savel 2005	HLoS	RCT. Mean core temperature was below 36.0°C for 'normothermic' group at start of the case
Schmeid 1998	BT	Retrospective cohort study. Multivariate analysis but covariate was active warming rather than hypothermia.
Slim	HLoS	RCT. Core temperature not recorded
Slotman 1985	Mortality	Retrospective cohort study. No multivariate analysis
Smith 1994	PACU	RCT. Mean core temperature was below 36.0°C for 'normothermic' group intraoperatively
Umenai 2006	HLoS, ICU, MV	RCT. Mean core temperature was below 36.0°C for 'normothermic' group intraoperatively

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Study	Outcome	Reason for exclusion
Wills 2001	HLoS	RCT. Mean core temperatures of both groups below 36.0°C preoperatively
Wong 2007	BT, SWI,	RCT. Core temperatures reported as median (range) and control group median above warmed group median between 120 and 210 minutes intraoperatively

Key: BT – blood transfusion; HLoS – hospital length of stay; Mort – mortality; MCE – morbid cardiac events; MV – mechanical ventilation; ICU/PACU – length of stay in ICU/PACU; SWI – surgical wound infection † Study included for some outcomes and excluded for others

E3: PREOPERATIVE WARMING DEVICES

Study	Reason for exclusion
Giesbrecht 1994	Volunteers; skin temperature outcome
Glosten 1993	Volunteers
Grief 2000	Resistive heating versus thermal insulation; Volunteers
Hynson 1993	Volunteers
Taguchi 2004	Volunteers actively cooled and subsequently warmed

E4: INTRAOPERATIVE WARMING DEVICES

Study	Reason for exclusion
Goll 1997	Fluid warming versus usual care; abstract only
Hohn 1998	Indirect population, therapeutic hypothermia; warming post-cardiopulmonary bypass; not considered to be generalisable.
Kulkarni 1995	GDG agreed that oesophageal exchange heater not common practise within the UK
Leben 1996	Warming in polytraumatic patients following hospital admission; but patients not undergoing surgery
Marker 1997	Forced air warming versus usual care; duration of postoperative recovery; abstract only
McGuire 1993	Abstract; volunteers
Nathan 2004	RCT. Population had cardiopulmonary bypass with cold cardioplegia and study group had active cooling. Not considered to be generalisable.
Schroeder 1999	Paper in foreign language(German); Forced air warming versus usual care; warmed IV fluids in both arms
Taguchi 2004	Forced air warming versus circulating water garment; volunteers
Tschernich 1996	Trial on wound infection and duration of hospitalisation following IPH; abstract only

E5: PREOPERATIVE AND INTRAOPERATIVE WARMING DEVICES

There were no excluded studies for this review

E6: ADVERSE EFFECTS OF WARMING DEVICES

There were no excluded studies for this review

E7: INTRAOPERATIVE PHASE: FLUID WARMING

Study	Reason for exclusion
Heathcote 1986	Non-randomised
McCarroll 1986	Indirect evidence on warming intravenous fluids
Smith 1999	Indirect evidence on warming intravenous fluids

E8: INTRAOPERATIVE PHASE: GASES

Study	Reason for exclusion
Bickler 1990	Comparing types of heat and moisture exchangers
Conahan 1987	Provided oral temperature results
Deriaz 1992	Paper in foreign language (French).
Huntington 1997	Measured heat loss
Jacobs 1999	Non-randomised study design
Linko 1984	Non-randomised study design
Ralley 1984	Cardipulmonary bypass patients

E9: PHARMACOLOGICAL AGENTS -PREVENTION

Study	Reason for exclusion
Abd El-Hakeem 2003	Indirect population: patients had undergone cardiopulmonary bypass under therapeutic hypothermia
Alfonsi 1995	Treatment of hypothermia not prevention
Baxendale 1994	Shivering only outcome measure
Beaussier 1998	Not intervention under study
Bilotta 2001	Not IPH
Chen 1991	Shivering only outcome measure
de Witte 1996	Not intervention under study
Generali 2005	Review not primary data
Harwood 1995	Not intervention under study
Hirose 1995	Drug not being used to prevent hypothermia
Holm 1997	Not IPH
Horn 1999	Not IPH
Kranke 2004	Review not primary data
Kudoh 2004	Not RCT
Nalda 1985	Drug not being used to prevent hypothermia

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Study	Reason for exclusion
Quintin 1991	Not intervention under study
Sarma 1991	Drug not being used to prevent hypothermia
Sevarino 1989	Indirect population: pregnant women undergoing Caesarean section
Terasako 2000	Drug not being used to prevent hypothermia
Wrench 1997	Drug not being used to prevent hypothermia

E10: TREATMENT: WARMING DEVICES

Study	Reason for exclusion
Goll 1997	Fluid warming versus usual care; abstract only
Huang 2003	Non randomised
Kulkarni 1995	GDG agreed that oesophageal exchange heater not common practise within the UK
Leben 1996	Warming in polytraumatic patients following hospital admission; but patients not undergoing surgery
Marker 1997	Forced air warming versus usual care; duration of postoperative recovery; abstract only
McGuire 1993	Abstract; volunteers
Schroeder 1999	Paper in foreign language(German); Forced air warming versus usual care; warmed IV fluids in both arms
Taguchi 2004	Forced air warming versus circulating water garment; volunteers
Tschernich 1996	Trial on wound infection and duration of hospitalisation following IPH; abstract only

References to excluded studies

Abd El-Hakeem EE and Zareh ZE (2003) Effects of dexamethasone on the incidence of shivering and recovery in patients undergoing valve replacement surgery, *Egyptian Journal of Anaesthesia*, 19(4):361-70.

Agrawal N, Sewell DA, Griswold ME, Frank SM, Hessel TW, and Eisele DW (2003) Hypothermia during head and neck surgery, *Laryngoscope*, 113(8):1278-82.

Alfonsi P, Hongnat JM, Lebrault C, and Chauvin M (1995) The effects of pethidine, fentanyl and lignocaine on postanaesthetic shivering, *Anaesthesia*, 50(3):214-7.

Barone JE, Tucker JB, Cecere J, Yoon MY, Reinhard E, Blabey RG, Jr., and Lowenfels AB (1999) Hypothermia does not result in more complications after colon surgery, *American Surgeon*, 65(4):356-9.

Baxendale BR, Mahajan RP, and Crossley AW (1994) Anticholinergic premedication influences the incidence of postoperative shivering, *British Journal of Anaesthesia*, 72(3):291-4.

Beaussier M, Deriaz H, Abdelahim Z, Aissa F, and Lienhart A (1998) Comparative effects of desflurane and isoflurane on recovery after long lasting anaesthesia, *Canadian Journal of Anaesthesia*, 45(5 Part 1):429-34.

Bernabei AF, Levison MA, and Bender JS (1992) The effects of hypothermia and injury severity on blood loss during trauma laparotomy, *Journal of Trauma-Injury Infection and Critical Care*, 33(6):835-9.

Bernard JM, Fulgencio JP, Delaunay L, and Bonnet F (1998) Clonidine does not impair redistribution hypothermia after the induction of anesthesia, *Anesthesia and Analgesia*, 87(1):168-72.

Bickler PE and Sessler DI (1990) Efficiency of airway heat and moisture exchangers in anesthetized humans, *Anesthesia and Analgesia*, 71(4):415-8.

Bilotta F, Pietropaoli P, La R, I, Spinelli F, and Rosa G (2001) Effects of shivering prevention on haemodynamic and metabolic demands in hypothermic postoperative neurosurgical patients, *Anaesthesia*, 56(6):514-9.

Bush Jr HL, Hydo LJ, Fischer E, Fantini GA, Silane MF, Barie PS, Cohen JR, Ascer E, Schanzer H, Spence RK, Razvi SA, and LoGerfo FW (1995) Hypothermia during elective abdominal aortic aneurysm repair: The high price of avoidable morbidity, *Journal of Vascular Surgery*, 21(3):392-402.

Caverni V, Rosa G, Pinto G, Tordiglione P, and Favaro R (2005) Hypotensive anesthesia and recovery of cognitive function in long-term craniofacial surgery, *Journal of Craniofacial Surgery*, 16(4):531-6.

Chen AK and Kwan WFHarrity WV (1991) The effect of epidural butorphanol and fentanyl on shivering during cesarean section, *Regional Anesthesia*, 16(Suppl 1):30.

Conahan III TJ, Williams GD, Appelbaum JL, and Lecky JH (1987) Airway heating reduces recovery time (cost) in outpatients, *Anesthesiology*, 67(1):128-30.

Cory M, Fossum S, Donaldson K, Francis D, and Davis J (1998) Constant temperature monitoring: a study of temperature patterns in the postanesthesia care unit, *Journal of PeriAnesthesia Nursing*, 13(5):292-300.

De Witte J, Deloof T, de Veylder J, and Housmans P (1996) Tramadol for treatment of shivering after general anaesthesia, *British Journal of Anaesthesia*, 76 Suppl 2:91-2.

Deriaz H, Fiez N, and Lienhart A (1992) Comparative effects of a hygrophobic filter and a heated humidifier on intraoperative hypothermia, *Annales Francaises D'Anesthesie Et De Reanimation*, 11(2):145-9.

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

- Edwards RK, Madani K, and Duff P (2003) Is perioperative hypothermia a risk factor for post-Cesarean infection?, *Infectious Diseases in Obstetrics and Gynecology*, 11(2):75-80.
- Generali J and Cada DJ (2005) Clonidine: Postanesthesia shivering, *Hospital Pharmacy*, 40(7):570-81.
- Gentilello LM, Jurkovich GJ, Stark MS, Hassantash SA, O'Keefe GE, Lewis FR, Fabian TC, Carrico CJ, Diamond DL, Meyer AA, and Baker CC (1997) Is hypothermia in the victim of major trauma protective or harmful? A randomized, prospective study, *Annals of Surgery*, 226(4):439-49.
- Giesbrecht GG, Ducharme MB, and McGuire JP (1994) Comparison of forced-air patient warming systems for perioperative use, *Anesthesiology*, 80(3):671-9.
- Glosten B, Hynson J, Sessler DI, and McGuire J (1993) Preanesthetic skin-surface warming reduces redistribution hypothermia caused by epidural block, *Anesthesia and Analgesia*, 77(3):488-93.
- Goll V, Greher M, Hartmann T, Narzt E, Akca O, Glaser C, and Sessler DI (1997) Very mild hypothermia increases blood loss during hip arthroplasties, *Acta Anaesthesiologica Scandinavica*, 41(suppl 111):349.
- Greif R, Rajek A, Laciny S, Bastanmehr H, and Sessler DI (2000) Resistive heating is more effective than metallic-foil insulation in an experimental model of accidental hypothermia: A randomized controlled trial, *Annals of Emergency Medicine*, 35(4):337-45.
- Hartley SC, Cartwright DP, Wright CJ, and Razvi SH (1989) A multicentre trial in spontaneously breathing patients. A comparison of recovery following alfentanil or enflurane, *Acta Anaesthesiologica Belgica*, 40(1):41-51.
- Harwood RJ, Singh P, Cartwright DP, and Crossley AW (1995) The effect of different end-tidal volatile agent and carbon dioxide concentrations upon the incidence of postoperative shivering, *Anaesthesia*, 50(9):786-8.
- Heathcote PS and Dyer PM (1986) The effect of warm irrigation on blood loss during transurethral prostatectomy under spinal anaesthesia, *British Journal of Urology*, 58(6):669-71.
- Hirose M, Hara Y, and Matsusaki M (1995) Premedication with famotidine augments core hypothermia during general anesthesia, *Anesthesiology*, 83(6):1179-83.
- Hohn L, Schweizer A, Kalangos A, Morel DR, Bednarkiewicz M, and Licker M (1998) Benefits of intraoperative skin surface warming in cardiac surgical patients, *British Journal of Anaesthesia*, 80(3):318-23.
- Holm EP, Sessler DI, Standl T, and am Esch JS (1997) Shivering following normothermic desflurane or isoflurane anesthesia, *Acta Anaesthesiologica Scandinavica - Supplementum*, 111:321-2.
- Horn EP, Schroeder F, Wilhelm S, Sessler DI, Standl T, von dem BK, and Schulte am EJ (1999) Postoperative pain facilitates nonthermoregulatory tremor, *Anesthesiology*, 91(4):979-84.
- Huntington TR and LeMaster CB (1997) Laparoscopic hypothermia: Heat loss from insufflation gas flow, *Surgical Laparoscopy and Endoscopy*, 7(2):153-5.
- Hynson JM, Sessler DI, Moayeri A, McGuire J, and Schroeder M (1993) The effects of preinduction warming on temperature and blood pressure during propofol/nitrous oxide anesthesia, *Anesthesiology*, 79(2):219-28.
- Jacobs VR, Morrison JE, Jr., Mettler L, Mundhenke C, and Jonat W (1999) Measurement of CO₂ hypothermia during laparoscopy and pelviscopy: how cold it gets and how to prevent it, *Journal of the American Association of Gynecologic Laparoscopists*, 6(3):289-95.

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

- Janczyk RJ, Howells GA, Bair HA, Huang R, Bendick PJ, and Zelenock GB (2004) Hypothermia is an independent predictor of mortality in ruptured abdominal aortic aneurysms, *Vascular and Endovascular Surgery*, 38(1):37-42.
- Khosravi A, Moinvaziri MT, Esmaili MH, Farbood AR, Nik-Khoo H, and Yarmohammadi H (2002) Treatment of postoperative shivering with dexamethasone: A prospective randomized clinical trial, *Iranian Journal of Medical Sciences*, 27(1):15-7.
- Kranke P, Eberhart LH, Roewer N, and Tramer MR (2004) Single-dose parenteral pharmacological interventions for the prevention of postoperative shivering: a quantitative systematic review of randomized controlled trials, *Anesthesia and Analgesia*, 99(3):718-27.
- Kudoh A, Takase H, and Takazawa T (2004) Chronic treatment with antipsychotics enhances intraoperative core hypothermia, *Anesthesia and Analgesia*, 98(1):111-5.
- Kulkarni P, Webster J, and Carli F (1995) Body heat transfer during hip surgery using active core warming, *Canadian Journal of Anaesthesia*, 42(7):571-6.
- Kurz A, Xiong J, Sessler DI, Plattner O, Christensen R, Dechert M, and Ikeda T (1997) Isoflurane produces marked and nonlinear decreases in the vasoconstriction and shivering thresholds, *Annals of the New York Academy of Sciences*, 813(pp 778-785):-785.
- Launo C, Bassi C, Spagnolo L, Badano S, Ricci C, Lizzi A, and Molinino M (2004) Preemptive ketamine during general anesthesia for postoperative analgesia in patients undergoing laparoscopic cholecystectomy, *Minerva Anestesiologica*, 70(10):727-38.
- Leben J, Heuer L, and Tryba (1996) Can Active Rewarming Improve The Perioperative Course Of Polytraumatized Patients?, *Intensive Care Medicine*, 22(Suppl 1):S104.
- Linko K, Honkavaara P, and Nieminen MT (1984) Heated humidification in major abdominal surgery, *European Journal of Anaesthesiology*, 1(3):285-91.
- Marker E, Lenhardt R, Sessler KA, Narzt E, Goll V, and Tschernich H (1997) Intraoperative hypothermia prolongs duration of postoperative recovery, *Acta Anaesthesiologica Scandinavica*, 41(suppl 111):331.
- McCarroll SM, Cartwright P, Weeks SK, and Donati F (1986) Warming intravenous fluids and the incidence of shivering during caesarean sections under epidural anaesthesia, *Canadian Anaesthetists' Society Journal*, 33:72-3.
- McGuire J and Giesbrecht G (1993) A comparison of three forced-air patient warming systems, *Anesthesia and Analgesia*, 76:S256.
- Melling AC and Leaper DJ (2006) The impact of warming on pain and wound healing after hernia surgery: a preliminary study, *Journal of Wound Care*, 15(3):104-8.
- Nalda MA, Gomar C, and Luis M (1985) The effect of ketanserin on post-anaesthetic vasoconstriction and shivering, *European Journal of Anaesthesiology*, 2(3):265-77.
- Nathan HJ, Parlea L, Dupuis JY, Hendry P, Williams KA, Rubens FD, and Wells GA (2004) Safety of deliberate intraoperative and postoperative hypothermia for patients undergoing coronary artery surgery: a randomized trial, *Journal of Thoracic and Cardiovascular Surgery*, 127(5):1270-5.
- Nguyen NT, Furdui G, Fleming NW, Lee SJ, Goldman CD, Singh A, and Wolfe BM (2002) Effect of heated and humidified carbon dioxide gas on core temperature and postoperative pain: a randomized trial, *Surgical Endoscopy*, 16(7):1050-4.
- Nicolaou G, Chen AA, Johnston CE, Kenny GP, Bristow GK, and Giesbrecht GG (1997) Clonidine decreases vasoconstriction and shivering thresholds, without affecting the sweating threshold, *Canadian Journal of Anaesthesia*, 44(6):636-42.

Inadvertent Perioperative Hypothermia: Full guideline (April 2008)

Panagiotis K, Maria P, Argiri P, and Panagiotis S (2005) Is postanesthesia care unit length of stay increased in hypothermic patients?, *AORN Journal*, 81(2):379-82-385-92.

Paterson DL, Staplefeldt WH, Wagener MM, Gayowski T, Marino IR, and Singh N (1999) Intraoperative hypothermia is an independent risk factor for early cytomegalovirus infection in liver transplant recipients, *Transplantation*, 67(8):1151-5.

Quintin L, Roudot F, Roux C, Macquin I, Basmaciogullari A, Guyene T, Vaubourdolle M, Viale JP, Bonnet F, and Ghignone M (1991) Effect of clonidine on the circulation and vasoactive hormones after aortic surgery, *British Journal of Anaesthesia*, 66(1):108-15.

Ralley FE, Ramsay JG, Wynands JE, Townsend GE, Whalley DG, and DelliColli P (1984) Effect of heated humidified gases on temperature drop after cardiopulmonary bypass, *Anesthesia and Analgesia*, 63(12):1106-10.

Sarma V and Fry EN (1991) Doxapram after general anaesthesia. Its role in stopping shivering during recovery, *Anaesthesia*, 46(6):460-1.

Schmied H, Schiferer A, Sessler DI, and Meznik C (1998) The effects of red-cell scavenging, hemodilution, and active warming on allogenic blood requirements in patients undergoing hip or knee arthroplasty, *Anesthesia and Analgesia*, 86(2):387-91.

Schroeder F, Horn E-P, Redmann G, and Standl T (1999) Partial body heating preserves normothermia in patients undergoing orthopaedic surgery, *Anesthesiologie, Intensivmedizin, Notfallmedizin, Schmerztherapie*, 34(8):475-9.

Sevarino FB, Johnson MD, Lema MJ, Datta S, Ostheimer GW, and Naulty JS (1989) The effect of epidural sufentanil on shivering and body temperature in the parturient, *Anesthesia and Analgesia*, 68(4):530-3.

Slotman GJ, Jed EH, and Burchard KW (1985) Adverse effects of hypothermia in postoperative patients, *American Journal of Surgery*, 149(4):495-501.

Smith CE, Parand A, Pinchak AC, Hagen JF, and Hancock DE (1999) The failure of negative pressure rewarming (Thermostat) to accelerate recovery from mild hypothermia in postoperative surgical patients, *Anesthesia and Analgesia*, 89(6):1541-5.

Taguchi A, Arkilic CF, Ahluwalia A, Sessler DI, and Kurz A (2001) Negative pressure rewarming vs. forced air warming in hypothermic postanesthetic volunteers, *Anesthesia and Analgesia*, 92(1):261-6.

Terasako K and Yamamoto M (2000) Comparison between pentazocine, pethidine and placebo in the treatment of post-anesthetic shivering, *Acta Anaesthesiologica Scandinavica*, 44(3):311-2.

Tschernich H (1996) Perioperative hypothermia increases the incidence of surgical wound infection and prolongs duration of hospitalization, *British Journal of Surgery*, 83:854.

Villamaria FJ, Baisden CE, Hillis A, Rajab MH, and Rinaldi PA (1997) Forced-air warming is no more effective than conventional methods for raising postoperative core temperature after cardiac surgery, *Journal of Cardiothoracic and Vascular Anesthesia*, 11(6):708-11.

Vogelsang J and Hayes SR (1989) Stadol attenuates postanesthesia shivering, *Journal of Post Anesthesia Nursing*, 4(4):222-7.

Wrench IJ, Singh P, Dennis AR, Mahajan RP, and Crossley AW (1997) The minimum effective doses of pethidine and doxapram in the treatment of post-anaesthetic shivering, *Anaesthesia*, 52(1):32-6.

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APPENDIX F: MULTIVARIATE RISK FACTORS

a) Patient risk factors: age

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) intraoperative (any time)</i>						
<i>age as continuous variable</i>						
Flores-Maldonado 1997; prospective cohort study in 130 patients	multivariate adjusted odds ratio	no data	not significant	Age 42y (SD 20)	age: 5 to 90 y (mean 42 SD 20); theatre temperature: mean 22.9 (SD 1.2)°C; ASA: ASA I 50%; ASA II 40%; ASA III / IV 10%; no warming mechanisms stated; mixed general / regional groups anaesthesia; duration: Mean surgical time 1.1h (SD 0.9) and 1.8 (SD 1.0)	age, gender, theatre temperature, duration of surgery, magnitude of surgery, blood transfusion, type of anaesthesia x3. Number of events / number of covariates = 53 / 7 = 8
<i>incidence of IPH (<36) in ICU</i>						
<i>age >70 vs age ≤40</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	2.16 (0.58, 8.06)	not statistically significant, fairly wide confidence intervals	21% <40, 47% 41-70y, 32% >70y	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); ASA: 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤2h.	neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)
<i>age 41-70 vs age ≤40</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	0.46 (0.15, 1.48)	not statistically significant	21% <40, 47% 41-70y, 32% >70y	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); ASA: 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤ 2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration of surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia). Number of events / number of covariates = 105 / 12 = 9

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Study name	Outcome	OR (95%CI)	Comments	Risk factor detail	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in PACU</i>						
<i>age > 65 vs age ≤65</i>						
Vorakitpokatorn 2006; prospective cohort study in 128 patients	multivariate adjusted odds ratio	0.48 (0.13, 1.85)	not significant	48.9 y (SD 13.54); 12.5% >65y	age: 48.9 y (SD 13.54); 12.5% >65y; theatre temperature: not stated; ASA: ASA I 59%; ASA II 31%; ASA III 9%; no warming mechanisms stated; general anaesthesia; duration of surgery 2h (SD 0.8); 44% had >2h	age, duration of surgery, volume of irrigation fluid, blood transfusion units. Constant: type of anaesthesia. Number of events / number of covariates = 72 / 4 = 18
<i>age ≥ 65 vs age <15</i>						
Lau 2001; prospective cohort study in 18759 patients	multivariate adjusted odds ratio	2.62 (1.01, 6.76)	Statistically significant; favours younger age	13% <15y; 62% 15-64; 24% >65	age: 13% <15y; 62% 15-64; 24% >65; theatre temperature: not stated; ASA: ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%; warming mechanism not stated; mixed general / regional / combined anaesthesia; duration: Surgery duration for all patients >2h, but no details	age, ASA grade, type of anaesthesia, hospital. All of these were categorical variables.
<i>age 15-64 vs age <15</i>						
Lau 2001; prospective cohort study in 18759 patients	multivariate adjusted odds ratio	1.67 (0.65, 4.27)	not statistically significant; comparator is children <15y	13% <15y; 62% 15-64; 24% >65	age: 13% <15y; 62% 15-64; 24% >65; theatre temperature: not stated; ASA: ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%; warming mechanism not stated; mixed general / regional / combined anaesthesia; duration: Surgery duration for all patients >2h, but no details	age, ASA grade, type of anaesthesia, hospital. All of these were categorical variables. Number of events / number of covariates = 111 / 4 = 28

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in PACU</i>						
<i>age 60-75 vs age 20--40</i>						
El-Gamal 2000; prospective cohort study in 40 patients	baseline comparable OR	3.35 (0.32, 35.36)	very wide confidence interval; not significant	2 groups: 33 y (SEM 2); 20-40 & 67 (SEM 2);	age: 2 groups: 33 y (SEM 2); 20-40 & 67 (SEM 2); theatre temperature: 25.6 or 25.9°C (SEM 0.3); range 24.2 to 28.5; ASA: I-II; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1.7-1.8 h (SEM 0.08)	2 selected cohorts, 20 aged 20-40y, 20 aged 60-75. Following held constant: ASA I-II, type of surgery (lower extremity orthopaedic), type of anaesthetic (GA). Comparable at baseline for BMI, duration of surgery, iv fluid volume; preoperative core temperature. Number of events / number of covariates = 40 / 1 = 40
<i>core temperature at 1h</i>						
<i>age 60-75 vs age 20-40</i>						
El-Gamal 2000; prospective cohort study in 40 patients	baseline comparable mean difference	-0.19°C (-0.25, -0.13)	Statistically significant, younger patients warmer core temperature: patients 36.6°C (i.e. not hypothermic)	2 groups: 33 y (SEM 2); 20-40 & 67 (SEM 2);	age: 2 groups: 33 y (SEM 2); 20-40 & 67 (SEM 2); theatre temperature: 25.6 or 25.9°C (SEM 0.3); range 24.2 to 28.5; ASA: I-II; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1.7-1.8 h (SEM 0.08)	2 selected cohorts, 20 aged 20-40y, 20 aged 60-75. Following held constant: ASA I-II, type of surgery (lower extremity orthopaedic), type of anaesthetic (GA). Comparable at baseline for BMI, duration of surgery, iv fluid volume; preoperative core temperature. Number of events / number of covariates = 40 / 1 = 40
<i>core temperature at 2h</i>						
<i>age 60-75 vs age 20-40</i>						
El-Gamal 2000; prospective cohort study in 40 patients	baseline comparable mean difference	-0.31°C (-0.44, -0.18)	Statistically significant, younger patients warmer, core temperature younger patients 36.5°C (i.e. not hypothermic)	2 groups: 33 y (SEM 2); 20-40 & 67 (SEM 2);	age: 2 groups: 33 y (SEM 2); 20-40 & 67 (SEM 2); theatre temperature: 25.6 or 25.9°C (SEM 0.3); range 24.2 to 28.5; ASA: I-II; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1.7-1.8 h (SEM 0.08)	2 selected cohorts, 20 aged 20-40y, 20 aged 60-75. Following held constant: ASA I-II, type of surgery (lower extremity orthopaedic), type of anaesthetic (GA). Comparable at baseline for BMI, duration of surgery, iv fluid volume; preoperative core temperature. Number of events / number of covariates = 40 / 1 = 40

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature in PACU</i>						
<i>age as continuous variable</i>						
Frank 2000; prospective cohort study in 44 patients	B from regression (non-standardised)	no data	statistically significant; p=0.01	Mean age 57y (SD 7) range 47 to 67	age: 57y (SD 7) range 47-67.; theatre temperature: mean 20.9°C (SD 0.13) range 18.7 to 22.9.; ASA: not stated or considered; no WD but fluids warmed; spinal anaesthesia; duration: Duration of surgery: mean 1.5 h (SD 0.9) range 1.1 to 2.6	age, duration of surgery, theatre temperature, body mass, % body fat, height of spinal block (+ univariate BMI). Number of events / number of covariates = 44 / 6 = 7
<i>age 60-75 vs age 20-40</i>						
El-Gamal 2000; prospective cohort study in 40 patients	baseline comparable mean difference	-0.3°C (-0.36, -0.24)	Statistically significant, younger patients warmer, core temperature younger patients 36.7°C (i.e. not hypothermic)	2 groups: 33 y (SEM 2); 20-40 & 67 (SEM 2); 60-75y	age: 2 groups: 33 y (SEM 2); 20-40 & 67 (SEM 2); theatre temperature: 25.6 or 25.9°C (SEM 0.3); range 24.2 to 28.5; ASA: I-II; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1.7-1.8 h (SEM 0.08)	2 selected cohorts, 20 aged 20-40y, 20 aged 60-75. Following held constant: ASA I-II, type of surgery (lower extremity orthopaedic), type of anaesthetic (GA). Comparable at baseline for BMI, duration of surgery, iv fluid volume; preoperative core temperature. Number of events / number of covariates = 40 / 1 = 40
<i>core temperature after 30 min in PACU</i>						
<i>age 60-75 vs age 20-40</i>						
El-Gamal 2000; prospective cohort study in 40 patients	baseline comparable mean difference	-0.26°C (-0.34, -0.18)	Statistically significant, younger patients warmer, core temperature younger patients 37.1°C (i.e. not hypothermic)	2 groups: 33 y (SEM 2); 20-40 & 67 (SEM 2); 60-75y	age: 2 groups: 33 y (SEM 2); 20-40 & 67 (SEM 2); theatre temperature: 25.6 or 25.9°C (SEM 0.3); range 24.2 to 28.5; ASA: I-II; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1.7-1.8 h (SEM 0.08)	2 selected cohorts, 20 aged 20-40y, 20 aged 60-75. Following held constant: ASA I-II, type of surgery (lower extremity orthopaedic), type of anaesthetic (GA). Comparable at baseline for BMI, duration of surgery, iv fluid volume; preoperative core temperature. Number of events / number of covariates = 40 / 1 = 40

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature after 45 min in PACU</i>						
<i>age 60-75 vs age 20-40</i>						
El-Gamal 2000; prospective cohort study in 40 patients	baseline comparable mean difference	-0.26°C (-0.33, -0.19)	Statistically significant, younger patients warmer, core temperature younger patients 37.2°C (i.e. not hypothermic)	2 groups: 33 y (SEM 2); 20-40 & 67 (SEM 2); 60-75 y	age: 2 groups: 33 y (SEM 2); 20-40 & 67 (SEM 2); theatre temperature: 25.6 or 25.9°C (SEM 0.3); range 24.2 to 28.5; ASA: I-II; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1.7-1.8 h (SEM 0.08)	2 selected cohorts, 20 aged 20-40y, 20 aged 60-75. Following held constant: ASA I-II, type of surgery (lower extremity orthopaedic), type of anaesthetic (GA). Comparable at baseline for BMI, duration of surgery, iv fluid volume; preoperative core temperature. Number of events / number of covariates = 40 / 1 = 40
<i>change in temperature</i>						
<i>age as continuous variable</i>						
Hind 1994a; prospective cohort study in 30 patients	B from regression (non-standardised)	-0.06°C / year	'Drop in oesophageal temperature' =+ 0.06; probably maximum drop. statistically significant, favouring lower age (t=3.3; p<0.01)	51.43 y (SD 12.01); range 37 to 76. NB several correlations with age and other RFs.	age: 51.43 y (SD 12.01); range 37 to 76; theatre temperature: 21.3°C (SD 1.2); 19.6-23.3. RH: 56% (4); 50-65; ASA: not stated; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1-2h	1st of 2 multivariate analyses that fitted the data. Factors included: age, theatre temperature, body fat index, iv fluids, and total blood loss (from univariate correlations). Excluded: surgery duration, theatre humidity. Constant: type of anaesthesia. Number of events / number of covariates = 30 / 5 = 6
Frank 1992; prospective cohort study in 97 patients	beta from regression (standardised)	-0.11°C / year	p=0.03; difference between 'first intraoperative temperature, and preoperative temperature, Favours lower ages. Probably standardised coefficients.	General warm 65.2 (SD 2.0) y; general cold 68.2 (2.1); epidural warm 62.9 (2.0); epidural cold 60.2 (3.2)	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no WD but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in theatre: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)	ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii)
Hind 1994a; prospective cohort study in 30 patients	beta from regression (standardised)	0.4°C	'Drop in oesophageal temperature' - probably maximum drop. Beta reported to be statistically significant, favouring lower age (p<0.01)	51.43 y (SD 12.01); range 37 to 76. NB several correlations with age and other RFs.	age: 51.43 y (SD 12.01); range 37 to 76; theatre temperature: 21.3°C (SD 1.2); 19.6-23.3. RH: 56% (4); 50-65; ASA: not stated; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1-2h	1st of 2 multivariate analyses that fitted the data. Factors included: age, theatre temperature, body fat index, iv fluids, and total blood loss (from univariate correlations). Excluded: surgery duration, theatre humidity. Constant: type of anaesthesia. Number of events / number of covariates = 30 / 5 = 6

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>rate of change of temperature intraoperative</i>						
<i>age ≥ 60 vs age <60</i>						
Kitamura 2000; prospective cohort study in 36 patients	baseline comparable mean difference	0°C / h (-0.13, 0.13)	No significant difference; younger group change in intraoperative temperature rate 0.80°C / h	69 (SD 5) and 48 y (SD 28) (data given by subgroup)	age: 69 (SD 5) and 48 y (SD 28) (data given by subgroup); theatre temperature: 23°C; ASA: not stated; no warming devices; general anaesthesia; duration: duration of surgery 3.2 (SD 0.6) and 3.5 (SD 1.0) h	2 cohorts, diabetic and controls, divided into young and old controls, and diabetic neuropathy positive or not. All groups comparable for age, BMI, iv fluid rate, duration of surgery, ambient temperature. Constant: type of anaesthesia.
<i>time to rewarm to 36°C</i>						
<i>age as continuous variable</i>						
Frank 1992; prospective cohort study in 97 patients	beta from regression (standardised)	0.111 h / year	statistically significant in favour of lower ages (p ≤0.05). Probably standardised coefficients.	General warm 65.2 (SD2.0) y; general cold 68.2 (2.1); epidural warm 62.9 (2.0); epidural cold 60.2 (3.2)	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no WD but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in theatre: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)	ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii)

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b) Patient risk factors: gender

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) intraoperative(any time)</i>						
<i>men vs women</i>						
Flores-Maldonado 1997; prospective cohort study in 130 patients	multivariate adjusted odds ratio	no data	not significant	Men 53%	age: 5 to 90 y (mean 42 SD20); theatre temperature: mean 22.9 (SD 1.2)°C; ASA: ASA I 50%; ASA II 40%; ASA III / IV 10%; no warming mechanisms stated; mixed general / regional groups anaesthesia; duration: Mean surgical time 1.1h (SD 0.9) and 1.8 (SD 1.0)	age, gender, theatre temperature, duration of surgery, magnitude of surgery, blood transfusion, type of anaesthetic

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c) Patient risk factors: ASA grade

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) in ICU</i>						
<i>ASA >II vs ASA I</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	8.35 (1.67, 41.88)	statistically significant, favours ASA I, wide confidence intervals	19% ASA I; 55% ASA II; 26% ASA >II.	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); ASA: 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)
<i>ASA II vs ASA I</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	2.87 (0.82, 10.03)	not statistically significant, fairly wide confidence intervals	19% ASA I; 55% ASA II; 26% ASA >II.	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); ASA: 19% ASA I; 55% ASA II; 26% ASA >II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤2h.	neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)
<i>incidence of IPH (<35) in PACU</i>						
<i>ASA II vs ASA I</i>						
Lau 2001; prospective cohort study in 18759 patients	multivariate adjusted odds ratio	1.83 (1.04, 3.19)	Statistically significant; favours ASA I	ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%	age: 13% <15y; 62% 15-64; 24% >65; theatre temperature: not stated; ASA: ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%; warming mechanism not stated; mixed general / regional / combined anaesthesia; duration: Surgery duration for all patients >2h, but no details	age, ASA grade, type of anaesthesia, hospital. All of these were categorical variables.

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in PACU</i>						
<i>ASA III vs ASA I</i>						
Lau 2001; prospective cohort study in 18759 patients	multivariate adjusted odds ratio	1.79 (0.94, 3.4)	not significant; favours ASA I	ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%	age: 13% <15y; 62% 15-64; 24% >65; theatre temperature: not stated; ASA: ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%; warming mechanism not stated; mixed general / regional / combined anaesthesia; duration: Surgery duration for all patients >2h, but no details	age, ASA grade, type of anaesthesia, hospital. All of these were categorical variables.
<i>ASA IV vs ASA I</i>						
Lau 2001; prospective cohort study in 18759 patients	multivariate adjusted odds ratio	3.22 (1.37, 7.54)	statistically significant; favours ASA I	ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%	age: 13% <15y; 62% 15-64; 24% >65; theatre temperature: not stated; ASA: ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%; warming mechanism not stated; mixed general / regional / combined anaesthesia; duration: Surgery duration for all patients >2h, but no details	age, ASA grade, type of anaesthesia, hospital. All of these were categorical variables.
<i>incidence of IPH (<35) in PACU</i>						
<i>ASA V vs ASA I</i>						
Lau 2001; prospective cohort study in 18759 patients	multivariate adjusted odds ratio	19.91 (4.77, 88.03)	fairly wide confidence interval; large effect; statistically significant; favours ASA I	ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%	age: 13% <15y; 62% 15-64; 24% >65; theatre temperature: not stated; ASA: ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%; warming mechanism not stated; mixed general / regional / combined anaesthesia; duration: Surgery duration for all patients >2h, but no details	age, ASA grade, type of anaesthesia, hospital. All of these were categorical variables.

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d) Patient risk factors: Score of Acute physiologic system (SAPS II)

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in ICU</i>						
<i>SAPS II as continuous variable</i>						
Abelha 2005; prospective cohort study in 185 patients	multivariate adjusted odds ratio	1 (1, 1.7)	p=0.014 -a bit skewed?	SAPS II Score 24.4 (SD 14.0) range 3 to 74 (max possible=162 poor).	age: 66.0 y (SD 12.6), range 25 to 94; theatre temperature: 20-22°C (not adjusted for); ASA: ASA I 3%, ASA II 39%, ASA III 49%, ASA IV 10%.; some had warming mechanisms; mixed general / regional / combined anaesthesia; duration: Anaesthesia duration: 3.6 h (SD 1.8) range 0.7 to 11h; 51% >3h	magnitude of surgery, iv crystalloids, preoperative patient temperature, SAPS II + adjusted for: anaesthesia type, anaesthesia duration, temperature monitoring, FAW, packed erythrocytes. Univariate: age, gender, body weight, BMI, ASA, emergency, iv colloids, plasma

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e) Patient risk factors: body weight

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) in ICU</i>						
<i>body weight as continuous variable</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	0.94 (0.89, 0.98)	small statistically significant effect, favours higher body weight	Mean 57.2kg (SD 12) range 30-91.	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); ASA: 19% ASA I; 55% ASA II; 26% ASA >II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤ 2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)
<i>change in temperature at 1h</i>						
<i>body weight as continuous variable</i>						
Kurz 1995; prospective cohort study in 40 patients	B from regression (non-standardised)	no data	not significant; change in core temperature over 1st hour	weight mean 73 kg (SD 20), range 40-110)	age: mean 59 y (SD 14), range 26-79 y; theatre temperature: maintained at 21.0°C (SD 0.4); ASA: I-III; no WD but fluids warmed; general anaesthesia; duration: mean duration of surgery 3.8 h (SD 1.3)	multivariate included gender, height, weight, % body fat, surface area and weight / surface area ratio. Type of surgery comparable for different size patients. Type of anaesthesia constant. No consideration taken of age or ASA grade.
<i>core temperature in PACU</i>						
<i>body weight as continuous variable</i>						
Frank 2000; prospective cohort study in 44 patients	B from regression (non-standardised)	no data	not statistically significant; p=0.14	Body weight mean 88kg (SD 20) range 70 to 120.	age: 57y (SD 7) range 47-67.; theatre temperature: mean 20.9°C (SD 0.13) range 18.7 to 22.9.; ASA: not stated or considered; no WD but fluids warmed; spinal anaesthesia; duration: Duration of surgery: mean 1.5 h (SD 0.9) range 1.1 to 2.6	age, duration of surgery, theatre temperature, body weight, % body fat, height of spinal blockage (+ univariate BMI)

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f) Patient risk factors: body fat

Study name	Outcome	B 95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>change in temperature at 1h</i>						
<i>body fat % as continuous variable</i>						
Kurz 1995; prospective cohort study in 40 patients	B from regression (non-standardised)	0.016°C / %	Statistically significant, favours higher % body fat, but p values / SE not given (appears to be p<0.01), change in core temperature over 1st hour	% body fat ranged from 15 to 49%	age: mean 59 y (SD 14), range 26-79 y; theatre temperature: maintained at 21.0°C (SD 0.4); ASA: I-III; no WD but fluids warmed; general anaesthesia; duration: mean duration of surgery 3.8 h (SD 1.3)	multivariate included gender, height, weight, % body fat, surface area and weight / surface area ratio. Type of surgery comparable for different size patients. Type of anaesthesia constant. No consideration taken of age or ASA grade. Number of events / number of covariates = 40 / 5 = 8
Yamakage 2000; prospective cohort study in 60 patients	B from regression (non-standardised)	no data	stated to be not significant (p=0.054)	height 159 cm (SD 7); weight 63 kg (SD 8); skinfold measurements to right of patient; total body fat calculated from age and sex specific regression	age: 58 (SD 10) y; theatre temperature: 23.2°C (SD 0.7); humidity 31% (SD 8%); ASA: I-II; no WD but fluids warmed; general anaesthesia; duration: approx 3h	Type of anaesthesia held constant at baseline: duration of anaesthesia effectively constant because considered at particular times less than duration of operation. Age partly adjusted in body fat calculator. Number of events / number of covariates = 60 / 1 = 60
<i>change in temperature at 2h</i>						
<i>body fat % as continuous variable</i>						
Yamakage 2000; prospective cohort study in 60 patients	B from regression (non-standardised)	-0.03°C / %	change in temperature over 1-3 hours; statistically significant (p<0.0001), favours higher body fat	height 159 cm (SD 7); weight 63 kg (SD 8); skinfold measurements to right of patient; total body fat calculated from age and sex specific regression	age: 58 (SD 10) y; theatre temperature: 23.2°C (SD 0.7); humidity 31% (SD 8%); ASA: I-II; no WD but fluids warmed; general anaesthesia; duration: approx 3h	Type of anaesthesia held constant at baseline: duration of anaesthesia effectively constant because considered at particular times less than duration of operation. Age partly adjusted in body fat calculator. Number of events / number of covariates = 60 / 1 = 60

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study name	outcome	B (95%CI)	comments	risk factor details	other details	factors adjusted for in multivariate analysis
<i>core temperature in PACU</i>						
<i>body fat % as continuous variable</i>						
Frank 2000; prospective cohort study in 44 patients	B from regression (non-standardised)	no data	not statistically significant; p=0.14	Body fat 27% (SD 7) range 13-39	age: 57y (SD 7) range 47-67.; theatre temperature: mean 20.9°C (SD 0.13) range 18.7 to 22.9.; ASA: not stated or considered; no WD but fluids warmed; spinal anaesthesia; duration: Duration of surgery: mean 1.5 h (SD 0.9) range 1.1 to 2.6	age, duration of surgery, theatre temperature, body weight, % body fat, height of spinal blockage (+ univariate BMI)
<i>change in temperature</i>						
<i>body fat % as continuous variable</i>						
Hind 1994a; prospective cohort study in 30 patients	beta from regression (standardised)	no data	'Drop in oesophageal temperature' - probably maximum drop. Not significant in analysis 1: correlations with age and theatre temperature.	23.7% (SD 1.2); 15-39.4%. Skinfold measurement. NB correlations with age and theatre temperature. Unexpected negative correlation with age.	age: 51.43 y (SD 12.01); range 37 to 76; theatre temperature: 21.3°C (SD 1.2); 19.6-23.3. RH: 56% (4); 50-65; ASA: not stated; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1-2h	1 of 2 multivariate analyses that fitted the data. Factors included: age, theatre temperature, body fat index, iv fluids, and total blood loss (chosen from univariate correlations). Excluded: surgery duration, theatre humidity. Constant: type of anaesthesia.

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g) Patient risk factors: body weight / surface area

Study name	Outcome	B (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>change in temperature at 1h</i>						
<i>body weight / surface area as continuous variable</i>						
Kurz 1995; prospective cohort study in 40 patients	B from regression (non-standardised)	0.033 °C m ² / kg	Statistically significant, favours higher weight / surface area, but p values / SE not given (appears to be p<0.01), change in core temperature over 1st hour	weight / surface area (calculated using formula)	age: mean 59 y (SD 14), range 26-79 y; theatre temperature: maintained at 21.0°C (SD 0.4); ASA: I-III; no WD but fluids warmed; general anaesthesia; duration: mean duration of surgery 3.8 h (SD 1.3)	multivariate included gender, height, weight, % body fat, surface area and weight / surface area ratio. Type of surgery comparable for different size patients. Type of anaesthesia constant. No consideration taken of age or ASA grade.

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h) Patient risk factors: height

Study name	Outcome	B (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>change in temperature at 1h</i>						
<i>height as continuous variable</i>						
Kurz 1995; prospective cohort study in 40 patients	B from regression (non-standardised)	no data	not significant; change in core temperature over 1st hour	height mean 169 cm (SD 7), range 152-180)	age: mean 59 y (SD 14), range 26-79 y; theatre temperature: maintained at 21.0°C (SD 0.4); ASA: I-III; no WD but fluids warmed; general anaesthesia; duration: mean duration of surgery 3.8 h (SD 1.3)	

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i) Patient risk factors: diabetes

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) in ICU</i>						
<i>history of diabetic neuropathy vs No history</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	0.86 (0.24, 3.14)	not significant,	14% had history of diabetic neuropathy	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); ASA: 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤ 2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)
<i>change in temperature</i>						
<i>diabetes + no neuropathy vs not diabetes</i>						
Kitamura 2000; prospective cohort study in 50 patients	mean difference from RCT	-0.02°C (-0.15, 0.11)	No significant difference; control group change in intraoperative temperature rate 0.78°C / h	7 type I and 20 type II diabetic patients; 13 neuropathy positive, 14 neuropathy negative	age: 59 and 62 y (SD 12) (data given by subgroup); theatre temperature: 23°C; ASA: not stated; no warming devices; general anaesthesia; duration: duration of surgery 3.2 (SD 0.6) and 3.5 (SD 1.0) h	2 cohorts, diabetic and controls, divided into young and old controls, and diabetic neuropathy positive or not. All groups comparable for age, BMI, iv fluid rate, duration of surgery, ambient temperature. Constant: type of anaesthesia.
<i>rate of change of temperature intraoperative</i>						
<i>diabetes + neuropathy vs diabetes no neuropathy</i>						
Kitamura 2000; prospective cohort study in 27 patients	baseline comparable mean difference	0.08°C / h (-0.12, 0.28)	Not significantly different; non-neuropathy group intraoperative temperature change rate 0.76°C / h	7 type I and 20 type II diabetic patients; 13 neuropathy positive, 14 neuropathy negative	age: 59 and 62 y (SD 12) (data given by subgroup); theatre temperature: 23°C; ASA: not stated; no warming devices; general anaesthesia; duration: duration of surgery 3.2 (SD 0.6) and 3.5 (SD 1.0) h	2 cohorts, diabetic & controls, divided into young and old controls, & diabetic neuropathy positive or not. All groups comparable for age, BMI, iv fluid rate, surgery duration, ambient temperature, Constant: type of anaesthesia. Significantly different for diastolic blood pressure in tilt. Number of events / number of covariates = 27 / 1 = 27

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j) Patient risk factors: Patient temperature in preoperative phase

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in ICU</i>						
<i>core temperature before surgery as continuous variable</i>						
Abelha 2005; prospective cohort study in 185 patients	multivariate adjusted odds ratio	0.3 (0.1, 0.7)	statistically significant, favours higher preoperative temperature	36.37°C (SD 0.49) range 35.00 to 38.60.	age: 66.0 y (SD 12.6), range 25 to 94; theatre temperature: 20-22°C (not adjusted for); ASA: ASA I 3%, ASA II 39%, ASA III 49%, ASA IV 10%; some had warming mechanisms; mixed general / regional / combined anaesthesia; duration: Anaesthesia duration: 3.6 h (SD 1.8) range 0.7 to 11h; 51% >3h	magnitude of surgery, iv crystalloids, preoperative patient temperature, SAPS II + adjusted for: anaesthesia type, anaesthesia duration, temperature monitoring, FAW, packed erythrocytes. Univariate: age, gender, body weight, BMI, ASA, emergency, iv colloids, plasma

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k) Patient risk factors: Patient temperature at start of intraoperative phase

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) in ICU</i>						
<i>core temperature before surgery as continuous variable</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	0.31 (0.15, 0.65)	statistically significant, favours higher patient temperature	Mean 37.0 (SD 0.7) range 34.5 to 39.3°C.	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); ASA: 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)

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I) Anaesthesia risk factors: anaesthesia: type

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) intraoperative (any time)</i>						
<i>epidural anaesthesia vs spinal or general</i>						
Flores-Maldonado 1997; prospective cohort study in 130 patients	multivariate adjusted odds ratio	no data	not significant	49% general, 17% spinal, 15% epidural, 24% miscellaneous	age: 5 to 90 y (mean 42 SD20); theatre temperature: mean 22.9 (SD 1.2)°C; ASA: ASA I 50%; ASA II 40%; ASA III / IV 10%; no warming mechanisms stated; mixed general / regional groups anaesthesia; duration: Mean surgical time 1.1h (SD 0.9) and 1.8 (SD 1.0)	age, gender, theatre temperature, duration of surgery, magnitude of surgery, blood transfusion, type of anaesthesia x3
<i>epidural anaesthesia vs general anaesthesia</i>						
Hendolin 1982; RCT study in 38 patients	OR from RCT	1.36 (0.35, 5.38)	Not significant but wide confidence intervals; half pts had nasopharyngeal temperature measurement	GA thiopentone / N ₂ O / O ₂ , pethidine with ventilator. EA T3 to T5	age: GA 66.6y (SD 6.6); EA 70.9 (SD 8.9); theatre temperature: 24°C; humidity 40-55%; ASA: mean 2.3 or 2.6 (SD 0.6); WD not stated but blood warmed; randomised to epidural / general anaesthesia; duration: Duration of anaesthesia around 24 h; duration of surgery about 14h	RCT. Baseline comparability age, weight, height, BMI, ASA. Factors kept constant: type of surgery, duration of surgery
<i>incidence of IPH (<36) in ICU</i>						
<i>general anaesthesia vs epidural or spinal</i>						
Flores-Maldonado 1997; prospective cohort study in 130 patients	multivariate adjusted odds ratio	no data	not significant	49% general, 17% spinal, 15% epidural, 24% miscellaneous	age: 5 to 90 y (mean 42 SD20); theatre temperature: mean 22.9 (SD 1.2)°C; ASA: ASA I 50%; ASA II 40%; ASA III / IV 10%; no warming mechanisms stated; mixed general / regional groups anaesthesia; duration: Mean surgical time 1.1h (SD 0.9) and 1.8 (SD 1.0)	age, gender, theatre temperature, duration of surgery, magnitude of surgery, blood transfusion, type of anaesthetic
<i>spinal anaesthesia vs epidural or general</i>						
Flores-Maldonado 1997; prospective cohort study in 130 patients	multivariate adjusted odds ratio	0.23 (0.06, 0.9)	statistically significant, favours spinal anaesthesia	49% general, 17% spinal, 15% epidural, 24% miscellaneous	age: 5 to 90 y (mean 42 SD20); theatre temperature: mean 22.9 (SD 1.2)°C; ASA: ASA I 50%; ASA II 40%; ASA III / IV 10%; no warming mechanisms stated; mixed general / regional groups anaesthesia; duration: Mean surgical time 1.1h (SD 0.9) and 1.8 (SD 1.0)	age, gender, theatre temperature, duration of surgery, magnitude of surgery, blood transfusion, type of anaesthetic

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) intraoperative (any time)</i>						
<i>epidural anaesthesia vs general anaesthesia</i>						
Hendolin 1982; RCT study in 38 patients	OR from RCT	17.6 (1.96, 157.94)	Statistically significant, favours general; very wide confidence intervals; half pts had nasopharyngeal temperature measurement	GA thiopentone / N ₂ O / O ₂ , pethidine with ventilator. EA T3 to T5	age: GA 66.6y (SD 6.6); EA 70.9 (SD 8.9); theatre temperature: 24°C; humidity 40-55%; ASA: mean 2.3 or 2.6 (SD 0.6); WD not stated but blood warmed; randomised to epidural / general anaesthesia; duration: Duration of anaesthesia around 24 h; duration of surgery about 14h	RCT. Baseline comparability age, weight, height, BMI, ASA. Factors kept constant: type of surgery, duration of surgery
<i>incidence of IPH (<36) in ICU</i>						
<i>Combined general / epidural anaesthesia vs general or regional</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	3.39 (1.05, 10.88)	statistically significant, favours non-combined general or regional anaesthesia	25% combined anaesthesia, 66% general, 9% regional	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); ASA: 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)
<i>regional anaesthesia vs general or combined</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	1.04 (0.18, 6.02)	not significant, fairly wide confidence intervals	66% general; 9% regional; 25% combined.	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); ASA: 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in PACU</i>						
<i>Combined general / regional anaesthesia vs general anaesthesia</i>						
Lau 2001; prospective cohort study in 18759 patients	multivariate adjusted odds ratio	2.77 (1.69, 4.55)	statistically significant; favours general	general 72%; major regional 19%; combined general / major regional 7%; others 1.7%	age: 13% <15y; 62% 15-64; 24% >65; theatre temperature: not stated; ASA: ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%; warming mechanism not stated; mixed general / regional / combined anaesthesia; duration: Surgery duration for all patients >2h, but no details	age, ASA grade, type of anaesthesia, hospital. All of these were categorical variables.
<i>general anaesthesia vs regional anaesthesia</i>						
Abelha 2005; prospective cohort study in 185 patients	multivariate adjusted odds ratio	no data	type of anaesthesia adjusted for in multivariate analysis but no results given	85% general, 10% regional, 4% combined.	age: 66.0 y (SD 12.6), range 25 to 94; theatre temperature: 20-22°C (not adjusted for); ASA: ASA I 3%, ASA II 39%, ASA III 49%, ASA IV 10%; some had warming mechanisms; mixed general / regional / combined anaesthesia; duration: Anaesthesia duration: 3.6 h (SD 1.8) range 0.7 to 11h; 51% >3h	magnitude of surgery, iv crystalloids, preoperative patient temperature, SAPS II + adjusted for: anaesthesia type, anaesthesia duration, temperature monitoring, FAW, packed erythrocytes. Univariate: age, gender, body weight, BMI, ASA, emergency, iv colloids, plasma
<i>regional anaesthesia vs general anaesthesia</i>						
Lau 2001; prospective cohort study in 18759 patients	multivariate adjusted odds ratio	0.22 (0.07, 0.7)	statistically significant; favours regional, fairly wide confidence intervals	general 72%; major regional 19%; combined general / major regional 7%; others 1.7%	age: 13% <15y; 62% 15-64; 24% >65; theatre temperature: not stated; ASA: ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%; warming mechanism not stated; mixed general / regional / combined anaesthesia; duration: Surgery duration for all patients >2h, but no details	age, ASA grade, type of anaesthesia, hospital. All of these were categorical variables.

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature at 15 min</i>						
<i>epidural anaesthesia vs general anaesthesia</i>						
Frank1994; RCT subgroup (non stratified) study in 15 patients	mean difference from RCT	0°C (0, 0)		GA group: iv morphine, sodium thiopental, succinylcholine for induction then 70% N ₂ O/O ₂ & isoflurane.	age: mean 57y; theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); younger age subgroup. Baseline comparability unclear for subgroup. Factors kept constant: type of surgery, ASA I-II
Frank 1994; RCT study in 30 patients	mean difference from RCT	0.27 (-0.01, 0.55)	From graph, not significant; fairly wide confidence intervals; GA group 36.13°C	EA group: bupivacaine	age: median 62 y (48-70); theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); also analysed as subgroups by age. Baseline comparable for age, body weight, duration surgery, theatre temperature, PACU temperature, blood transfusion. Not comparable: crystalloid admin (significantly higher in GA)

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature at 30 min</i>						
<i>epidural anaesthesia vs general anaesthesia</i>						
Frank1994; RCT subgroup (non stratified) study in 15 patients	mean difference from RCT	0°C (0, 0)		GA group: iv morphine, sodium thiopental, succinylcholine for induction then 70% N ₂ O /O ₂ & isoflurane.	age: mean 57y; theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); younger age subgroup. Baseline comparability unclear for subgroup. Factors kept constant: type of surgery, ASA I-II
Frank 1994; RCT study in 30 patients	mean difference from RCT	0.37°C (0.09, 0.65)	From graph, statistically significant; fairly wide confidence intervals; GA group 35.76°C	EA group: bupivacaine	age: median 62 y (48-70); theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); also analysed as subgroups by age. Baseline comparable for age, body weight, duration surgery, theatre temperature, PACU temperature, blood transfusion. Not comparable: crystalloid admin (significantly higher in GA)

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature at 1h</i>						
<i>epidural anaesthesia vs general anaesthesia</i>						
Frank 1994; RCT study in 30 patients	mean difference from RCT	0.16°C (-0.12, 0.44)	From graph, not significant; fairly wide confidence intervals; GA group 35.53°C	GA group had iv morphine, sodium thiopental, succinylcholine for induction; then 70% N ₂ O / O ₂ and isoflurane. EA group had bupivacaine	age: median 62 y (48-70); theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); also analysed as subgroups by age. Baseline comparable for age, body weight, duration surgery, theatre temperature, PACU temperature, blood transfusion. Not comparable: crystalloid admin (significantly higher in GA)
Frank1994; RCT subgroup (non stratified) study in 15 patients	mean difference from RCT	0°C (0, 0)			age: mean 57y; theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); younger age subgroup. Baseline comparability unclear for subgroup. Factors kept constant: type of surgery, ASA I-II
<i>lowest intraoperative core temperature</i>						
<i>epidural anaesthesia vs general anaesthesia</i>						
Frank 1994; RCT study in 30 patients	mean difference from RCT	-0.03°C (-0.48, 0.42)	From graph; not significant but fairly wide confidence intervals; GA group 35.53°C	GA group had iv morphine, sodium thiopental, succinylcholine for induction; then 70% N ₂ O / O ₂ and isoflurane. EA group had bupivacaine	age: median 62 y (48-70); theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); also analysed as subgroups by age. Baseline comparable for age, body weight, duration surgery, theatre temperature, PACU temperature, blood transfusion. Not comparable: crystalloid admin (significantly higher in GA)

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature at end of surgery</i>						
<i>epidural anaesthesia vs general anaesthesia</i>						
Frank1994; RCT subgroup (non stratified) study in 15 patients	mean difference from RCT	0.01°C (-0.67, 0.69)	younger subgroup; from graph, not significant but wide confidence intervals	GA group had iv morphine, sodium thiopental, succinylcholine	age: mean 57y; theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); younger age subgroup. Baseline comparability unclear for subgroup. Factors kept constant: type of surgery, ASA I-II
Frank1994; RCT subgroup (non stratified) study in 15 patients	mean difference from RCT	-0.22°C (-0.64, 0.2)	older subgroup; from graph, not significant, fairly wide confidence intervals	for induction; then 70% N ₂ O / O ₂ and isoflurane. EA group had bupivacaine	age: mean 67y; theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); older age subgroup. Baseline comparability unclear for subgroup. Factors kept constant: type of surgery, ASA I-II
Frank 1994; RCT study in 30 patients	mean difference from RCT	-0.1°C (-0.65, 0.45)	from graph, not significant but wide confidence intervals; GA group 35.60°C		age: median 62 y (48-70); theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); also analysed as subgroups by age. Baseline comparable for age, body weight, duration surgery, theatre temperature, PACU temperature, blood transfusion. Not comparable: crystalloid admin (significantly higher in GA)

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature in PACU</i>						
<i>Combined general / epidural anaesthesia vs general anaesthesia</i>						
Steinbrook 1997; RCT study in 13 patients	mean difference from RCT	0.1°C (-1.15, 1.35)	No significant difference, fairly wide confidence intervals, general anaesthesia 35.00°C	GA: Ind: thiopental / pancuronium or vecuronium; O ₂ / N ₂ O / isoflurane (0.5 to 1.5% end tidal). Combined: GA to 0.5% + bupivacaine/ T4 hydromorphone	age: GA: 47 (SD 5) ; combined: 38 (SD 13) y; theatre temperature: 20 to 22°C; ASA: I-III (IV and above excluded); no warming devices; mixed anaesthesia; duration: not stated	RCT. Comparable at baseline for height, blood loss, opioids, preoperative temperature. Not comparable for age, weight, intraoperative fluids (may not be significant difference).
<i>epidural anaesthesia vs general anaesthesia</i>						
Frank 1994; RCT study in 30 patients	mean difference from RCT	0°C (-0.39, 0.39)	From graph; not significant but wide confidence intervals; GA group 35.49°C	GA group: iv morphine, sodium thiopental,	age: median 62 y (48-70); theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); also analysed as subgroups by age. Baseline comparable for age, body weight, duration surgery, theatre temperature, PACU temperature, blood transfusion. Not comparable: crystalloid admin (significantly higher in GA)
Frank 1994; RCT subgroup (non stratified) study in 15 patients	mean difference from RCT	0.3°C (-0.2, 0.8)	younger subgroup; from graph, not significant but wide confidence intervals	succinylcholine for induction then 70% N ₂ O / O ₂ & isoflurane.	age: mean 57y; theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); younger age subgroup. Baseline comparability unclear for subgroup. Factors kept constant: type of surgery, ASA I-II
Frank 1994; RCT subgroup (non stratified) study in 15 patients	mean difference from RCT	-0.28°C (-0.8, 0.24)	older subgroup; from graph, not significant but wide confidence intervals	EA group: bupivacaine	age: mean 67y; theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); older age subgroup. Baseline comparability unclear for subgroup. Factors kept constant: type of surgery, ASA I-II

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature after 30 min in PACU</i>						
<i>epidural anaesthesia vs general anaesthesia</i>						
Frank 1994; RCT study in 30 patients	mean difference from RCT	-0.29°C (-0.8, 0.22)	From graph; not significant but wide confidence intervals; GA group 35.82°C	GA group had iv morphine, sodium thiopental, succinylcholine for induction; then 70% N ₂ O / O ₂ and isoflurane. EA group had bupivacaine	age: median 62 y (48-70); theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); also analysed as subgroups by age. Baseline comparable for age, body weight, duration surgery, theatre temperature, PACU temperature, blood transfusion. Not comparable: crystalloid admin (significantly higher in GA)
<i>core temperature after 60 min in PACU</i>						
<i>epidural anaesthesia vs general anaesthesia</i>						
Frank 1994; RCT study in 30 patients	mean difference from RCT	-0.09°C (-0.52, 0.34)	From graph; not significant but fairly wide confidence intervals; GA group 36.00°C	GA group had iv morphine, sodium thiopental, succinylcholine for induction; then 70% N ₂ O / O ₂ and isoflurane. EA group had bupivacaine	age: median 62 y (48-70); theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); also analysed as subgroups by age. Baseline comparable for age, body weight, duration surgery, theatre temperature, PACU temperature, blood transfusion. Not comparable: crystalloid admin (significantly higher in GA)
<i>change in temperature</i>						
<i>epidural anaesthesia vs general anaesthesia</i>						
Frank 1992; RCT study in 97 patients	beta from regression (standardised)	-5.22°C	p=0.003; difference between 'first intraoperative temperature, and preoperative temperature, favours epidural. Probably standardised coefficients.	General: thiamylal / fentanyl / succinylcholine; enflurane / N ₂ O. Epidural: bupivacaine / epinephrine T6-T8 block.	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no WD but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in theatre: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)	ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii). Number of events / number of covariates = 97 / 9 = 11

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>time to rewarm to 36°C</i>						
<i>epidural anaesthesia vs general anaesthesia</i>						
Frank 1992; RCT study in 97 patients	beta from regression (standardised)	no data	not significant	General: thiamylal / fentanyl / succinylcholine; enflurane / N ₂ O. Epidural: bupivacaine / epinephrine T6-T8 block.	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no WD but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in theatre: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)	ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii). Number of events / number of covariates = 97 / 9 = 11
Frank 1994; RCT study in 30 patients	mean difference from RCT	6 min (-35.57, 47.57)	Not significant but wide confidence intervals; GA group 56 min	GA group had iv morphine, sodium thiopental, succinylcholine for induction; then 70% N ₂ O / O ₂ and isoflurane. EA group had bupivacaine	age: median 62 y (48-70); theatre temperature: 21.7 (SEM 0.4) EA and 22.0 (SEM 0.4) GA; ASA: I-II; no WD but fluids warmed; randomised to epidural / general anaesthesia; duration: Duration of surgery: GA 3.4 (SD 0.2) h; EA 3.5 (SD 0.2) h	Stratified RCT (on surgeon); also analysed as subgroups by age. Baseline comparable for age, body weight, duration surgery, theatre temperature, PACU temperature, blood transfusion. Not comparable: crystalloid admin (significantly higher in GA)

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m) Anaesthesia risk factors: anaesthesia type x age

Study name	Outcome	Beta (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>change in temperature</i>						
<i>type anaesthesia x age as continuous variable</i>						
Frank 1992; prospective cohort study in 97 patients	beta from regression (standardised)	0.036	not statistically significant interaction; p=0.06. Probably standardised coefficients.	General warm 65.2 (SD2.0) y; general cold 68.2 (2.1); epidural warm 62.9 (2.0); epidural cold 60.2 (3.2)	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no warming devices but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in theatre: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)	ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii).

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n) Anaesthesia risk factors: anaesthesia: height of spinal block

Study name	Outcome	B (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature in PACU</i>						
<i>block level as continuous variable</i>						
Frank 2000; prospective cohort study in 44 patients	B from regression (non-standardised)	no data	statistically significant; p=0.002	Block height (dermatome level) T5 (SD 3) range T3 to T8.	age: 57y (SD 7) range 47-67.; theatre temperature: mean 20.9°C (SD 0.13) range 18.7 to 22.9.; ASA: not stated or considered; no warming devices but fluids warmed; spinal anaesthesia; duration: Duration of surgery: mean 1.5 h (SD 0.9) range 1.1 to 2.6	age, duration of surgery, theatre temperature, body weight, % body fat, height of spinal blockage (+ univariate BMI)

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o) Anaesthesia risk factors: anaesthesia: end expiratory pressure

Study name	Outcome	MD (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature at 20 min</i>						
<i>PEEP 10 cm H2O vs zero end expiratory pressure (ZEEP)</i>						
Mizobe 2005; RCT study in 16 patients	mean difference from RCT	0.13°C (-0.22, 0.48)	from graph, not statistically significant, fairly wide confidence intervals, ZEEP core temperature 36.36°C	PEEP 10 cm H2O initiated 10 min after induction, and maintained for 3h	age: 20 to 60 y; theatre temperature: 24°C; relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general / regional anaesthesia; duration: Anaesthesia maintained for 3h	RCT. Comparable at baseline for age, gender, weight, height, arterial pressure, heart rate, core temperature
<i>core temperature at 40 min</i>						
<i>PEEP 10 cm H2O vs zero end expiratory pressure (ZEEP)</i>						
Mizobe 2005; RCT study in 16 patients	mean difference from RCT	0.36°C (-0.02, 0.74)	from graph, not statistically significant, fairly wide confidence intervals, ZEEP core temperature 35.92°C	PEEP 10 cm H2O initiated 10 min after induction, and maintained for 3h	age: 20 to 60 y; theatre temperature: 24°C; relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general / regional anaesthesia; duration: Anaesthesia maintained for 3h	RCT. Comparable at baseline for age, gender, weight, height, arterial pressure, heart rate, core temperature
<i>core temperature at 1h</i>						
<i>PEEP 10 cm H2O vs zero end expiratory pressure (ZEEP)</i>						
Mizobe 2005; RCT study in 16 patients	mean difference from RCT	0.4°C (0.07, 0.73)	from graph, statistically significant, favours PEEP, fairly wide confidence intervals, ZEEP core temperature 35.64°C	PEEP 10 cm H2O initiated 10 min after induction, and maintained for 3h	age: 20 to 60 y; theatre temperature: 24°C; relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general / regional anaesthesia; duration: Anaesthesia maintained for 3h	RCT. Comparable at baseline for age, gender, weight, height, arterial pressure, heart rate, core temperature

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Study name	Outcome	MD (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature at 2h</i>						
<i>PEEP 10 cm H2O vs zero end expiratory pressure (ZEEP)</i>						
Mizobe 2005; RCT study in 16 patients	mean difference from RCT	0.61°C (0.17, 1.05)	from graph, statistically significant, favours PEEP, fairly wide confidence intervals, ZEEP core temperature 35.19°C	PEEP 10 cm H2O initiated 10 min after induction, and maintained for 3h	age: 20 to 60 y; theatre temperature: 24°C; relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general / regional anaesthesia; duration: Anaesthesia maintained for 3h	RCT. Comparable at baseline for age, gender, weight, height, arterial pressure, heart rate, core temperature
<i>core temperature at 3h</i>						
<i>PEEP 10 cm H2O vs zero end expiratory pressure (ZEEP)</i>						
Mizobe 2005; RCT study in 16 patients	mean difference from RCT	0.7°C (0.26, 1.14)	from text, statistically significant, favours PEEP, fairly wide confidence intervals, ZEEP core temperature 35.10°C	PEEP 10 cm H2O initiated 10 min after induction, and maintained for 3h	age: 20 to 60 y; theatre temperature: 24°C; relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general / regional anaesthesia; duration: Anaesthesia maintained for 3h	RCT. Comparable at baseline for age, gender, weight, height, arterial pressure, heart rate, core temperature

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p) Anaesthesia risk factors: duration of anaesthesia

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in ICU</i>						
<i>anaesthesia >3h vs duration of anaesthesia ≤3h</i>						
Abelha 2005; prospective cohort study in 185 patients	multivariate adjusted odds ratio	no data	duration of anaesthesia adjusted for in multivariate analysis but no results given (presumed NS)	218 min (SD 108) range 44 to 660 min; 51% >3h.	age: 66.0 y (SD 12.6), range 25 to 94; theatre temperature: 20-22°C (not adjusted for); ASA I 3%, ASA II 39%, ASA III 49%, ASA IV 10%; some had warming mechanisms; mixed general / regional / combined anaesthesia; duration: Anaesthesia duration: 3.6 h (SD 1.8) range 0.7 to 11h; 51% >3h	magnitude of surgery, iv crystalloids, preoperative patient temperature, SAPS II + adjusted for: anaesthesia type, anaesthesia duration, temperature monitoring, FAW, packed erythrocytes. Univariate: age, gender, body weight, BMI, ASA, emergency, iv colloids, plasma
<i>change in temperature</i>						
<i>time in theatre as continuous variable</i>						
Frank 1992; prospective cohort study in 97 patients	beta from regression (standardised)	no data	not significant	Time spent in operating room: general warm 6.6h (SD 0.5); general cold 4.4 (0.3); epidural warm 5.1 (0.3); epidural cold 5.5 (0.4)	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no WARMING DEVICES but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in theatre: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)	ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii)
<i>time to rewarm to 36°C</i>						
<i>time in theatre as continuous variable</i>						
Frank 1992; prospective cohort study in 97 patients	beta from regression (standardised)	no data	not significant	Time spent in operating room: general warm 6.6h (SD 0.5); general cold 4.4 (0.3); epidural warm 5.1 (0.3); epidural cold 5.5 (0.4)	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no WARMING DEVICES but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in theatre: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)	ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii)

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q) Surgery risk factors: duration of surgery

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) intraoperative (any time)</i>						
<i>duration of surgery as continuous variable</i>						
Flores-Maldonado 1997; prospective cohort study in 130 patients	multivariate adjusted odds ratio	no data	not significant	Mean surgical time 83 min (SD 59)	age: 5 to 90 y (mean 42 SD20); theatre temperature: mean 22.9 (SD 1.2)°C; ASA I 50%; ASA II 40%; ASA III/IV 10%; no warming mechanisms stated; mixed general / regional groups anaesthesia; Mean surgical time 1.1h (SD 0.9) and 1.8 (SD 1.0)	age, gender, theatre temperature, duration of surgery, magnitude of surgery, blood transfusion, type of anaesthetic
<i>incidence of IPH (<36) in ICU</i>						
<i>duration >2h vs duration of surgery ≤2h</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	4.5 (1.48, 13.68)	statistically significant, favours less than 2 h	0.25 to 10.25h range; 27% had ≤2h.	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general/regional /combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)
<i>incidence of IPH (<35) in PACU</i>						
<i>duration >2h vs duration of surgery ≤2h</i>						
Vorrakitpokatorn 2006; prospective cohort study in 128 patients	multivariate adjusted odds ratio	0.58 (0.19, 1.76)	not statistically significant	duration of surgery 120 min (SD 49); 44% had >2h.	age: 48.9 y (SD 13.54); 12.5% >65y; theatre temperature: not stated; ASA I 59%; ASA II 31%; ASA III 9%; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 2h (SD 0.8); 44% had >2h	age, duration of surgery, volume of irrigation fluid, blood transfusion units
<i>core temperature in PACU</i>						
<i>duration of surgery as continuous variable</i>						
Frank 2000; prospective cohort study in 44 patients	B from regression (non-standardised)	no data	not statistically significant; p=0.22	Duration of surgery: mean 92 min (SD 54) range 65 to 155	age: 57y (SD 7) range 47-67; theatre temperature: mean 20.9°C (SD 0.13) range 18.7 to 22.9.; ASA: not stated or considered; no warming devices but fluids warmed; spinal anaesthesia; duration: Duration of surgery: mean 1.5h (SD 0.9) range 1.1 to 2.6	age, duration of surgery, theatre temperature, body mass, % body fat, height of spinal blockage (+ univariate BMI)

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r) Surgery risk factors: surgery type

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) intraoperative (any time)</i>						
<i>laparoscopic procedure vs open procedure</i>						
Nguyen 2000; RCT study in 101 patients	OR from RCT	0.48 (0.04, 5.47)	very wide confidence intervals	open GBP through upper midline incision; laparoscopic GBP through 5 abdominal trocars.	age: mean 43 to 48 y (SD 8); theatre temperature: 20 to 22°C; ASA: not stated; all had FAW but fluids not warmed; general anaesthesia; duration: Duration surgery: laparoscopy 3.9h (SD 0.7); open 3.4h (SD 0.6)	
<i>incidence of IPH (<35) in PACU</i>						
<i>laparoscopic procedure vs open procedure</i>						
Nguyen 2000; RCT study in 101 patients	OR from RCT	0 (0, 0)	No severe IPH in PACU	open GBP through upper midline incision; laparoscopic GBP through 5 abdominal trocars.	age: mean 43 to 48 y (SD 8); theatre temperature: 20 to 22°C; ASA: not stated; all had FAW but fluids not warmed; general anaesthesia; duration: Duration surgery: laparoscopy 3.9h (SD 0.7); open 3.4h (SD 0.6)	
<i>incidence of IPH (<36) in PACU</i>						
<i>laparoscopic procedure vs open procedure</i>						
Nguyen 2000; RCT study in 101 patients	OR from RCT	1.33 (0.28, 6.29)	wide confidence interval	open GBP through upper midline incision; laparoscopic GBP through 5 abdominal trocars.	age: mean 43 to 48 y (SD 8); theatre temperature: 20 to 22°C; ASA: not stated; all had FAW but fluids not warmed; general anaesthesia; duration: Duration surgery: laparoscopy 3.9h (SD 0.7); open 3.4h (SD 0.6)	

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature at 30 min</i>						
<i>laparoscopic procedure vs open procedure</i>						
Nguyen 2000; RCT study in 101 patients	mean difference from RCT	0 (-0.19, 0.19)	No significant difference; open group 36.06°C	open GBP through upper midline incision; laparoscopic GBP through 5 abdominal trocars.	age: mean 43 to 48 y (SD 8); theatre temperature: 20 to 22°C; ASA: not stated; all had FAW but fluids not warmed; general anaesthesia; duration: Duration surgery: laparoscopy 3.9h (SD 0.7); open 3.4h (SD 0.6)	
Danelli 2002; RCT study in 44 patients	median from RCT	no data	Median and range given. Authors reported no significant differences between groups (and shown on graph)	laparoscopy with 30 °C Trendelenberg position; Open surgery (laparotomy) with midline incision	age: mean 64 and 62 y (SD 8); range 18 min to 75 max); theatre temperature: 21-23°C, laminar flow, relative humidity 40-45%; ASA: I-II; no warming devices but fluids warmed; combined general / regional anaesthesia; duration: duration of surgery median 4.1h (range 3-5h) and 3 h (2-6h)	RCT, comparable at baseline for age, gender, weight, height, blood loss, crystalloid infusion. Duration of surgery was significantly longer in the laparoscopic group (mean difference 1.1 h)
<i>core temperature at 1h</i>						
<i>laparoscopic procedure vs open procedure</i>						
Nguyen 2000; RCT study in 101 patients	mean difference from RCT	-0.03 (-0.23, 0.17)	No significant difference; open group 36.12°C	open GBP through upper midline incision; laparoscopic GBP through 5 abdominal trocars.	age: mean 43 to 48 y (SD 8); theatre temperature: 20 to 22°C; ASA: not stated; all had FAW but fluids not warmed; general anaesthesia; duration: Duration surgery: laparoscopy 3.9h (SD 0.7); open 3.4h (SD 0.6)	
Danelli 2002; RCT study in 44 patients	median from RCT	no data	Median and range given. Authors reported no significant differences between groups (and shown on graph)	laparoscopy with 30 °C Trendelenberg position; Open surgery (laparotomy) with midline incision	age: mean 64 and 62 y (SD 8); range 18 min to 75 max); theatre temperature: 21-23°C, laminar flow, relative humidity 40-45%; ASA: I-II; no warming devices but fluids warmed; combined general / regional anaesthesia; duration: duration of surgery median 4.1h (range 3-5h) and 3 h (2-6h)	RCT, comparable at baseline for age, gender, weight, height, blood loss, crystalloid infusion. Duration of surgery was significantly longer in the laparoscopic group (mean difference 1.1 h)

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature at 2h</i>						
<i>laparoscopic procedure vs open procedure</i>						
Nguyen 2000; RCT study in 101 patients	mean difference from RCT	-0.1 (-0.31, 0.11)	No significant difference; open group 36.35°C	open GBP through upper midline incision; laparoscopic GBP through 5 abdominal trocars.	age: mean 43 to 48 y (SD 8); theatre temperature: 20 to 22°C; ASA: not stated; all had FAW but fluids not warmed; general anaesthesia; duration: Duration surgery: laparoscopy 3.9h (SD 0.7); open 3.4h (SD 0.6)	
Danelli 2002; RCT study in 44 patients	median from RCT	no data	Median and range given. Authors reported no significant differences between groups (and shown on graph)	laparoscopy with 30 °C Trendelenberg position; Open surgery (laparotomy) with midline incision	age: mean 64 and 62 y (SD 8); range 18 min to 75 max); theatre temperature: 21-23°C, laminar flow, relative humidity 40-45%; ASA: I-II; no warming devices but fluids warmed; combined general / regional anaesthesia; duration: duration of surgery median 4.1h (range 3-5h) and 3 h (2-6h)	RCT, comparable at baseline for age, gender, weight, height, blood loss, crystalloid infusion. Duration of surgery was significantly longer in the laparoscopic group (mean difference 1.1 h)
<i>core temperature at 3h</i>						
<i>laparoscopic procedure vs open procedure</i>						
Danelli 2002; RCT study in 44 patients	median from RCT	no data	Median and range given. Authors reported no significant differences between groups (and shown on graph)	laparoscopy with 30 °C Trendelenberg position; Open surgery (laparotomy) with midline incision	age: mean 64 and 62 y (SD 8); range 18 min to 75 max); theatre temperature: 21-23°C, laminar flow, relative humidity 40-45%; ASA: I-II; no warming devices but fluids warmed; combined general / regional anaesthesia; duration: duration of surgery median 4.1h (range 3-5h) and 3 h (2-6h)	RCT, comparable at baseline for age, gender, weight, height, blood loss, crystalloid infusion. Duration of surgery was significantly longer in the laparoscopic group (mean difference 1.1 h)

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature in PACU</i>						
<i>laparoscopic procedure vs open procedure</i>						
Nguyen 2000; RCT study in 101 patients	mean difference from RCT	-0.29 (-0.48, -0.1)	p=0.002; statistically significant difference, favouring open procedure	open GBP through upper midline incision; laparoscopic GBP through 5 abdominal trocars.	age: mean 43 to 48 y (SD 8); theatre temperature: 20 to 22°C; ASA: not stated; all had FAW but fluids not warmed; general anaesthesia; duration: Duration surgery: laparoscopy 3.9h (SD 0.7); open 3.4h (SD 0.6)	
Danelli 2002; RCT study in 44 patients	median from RCT	no data	Median and range given. Authors reported no significant differences between groups (and shown on graph)	laparoscopy with 30 °C Trendelenberg position; Open surgery (laparotomy) with midline incision	age: mean 64 and 62 y (SD 8); range 18 min to 75 max); theatre temperature: 21-23°C, laminar flow, relative humidity 40-45%; ASA: I-II; no warming devices but fluids warmed; combined general / regional anaesthesia; duration: duration of surgery median 4.1h (range 3-5h) and 3 h (2-6h)	RCT, comparable at baseline for age, gender, weight, height, blood loss, crystalloid infusion. Duration of surgery was significantly longer in the laparoscopic group (mean difference 1.1 h)
<i>core temperature after 30 min in PACU</i>						
<i>laparoscopic procedure vs open procedure</i>						
Danelli 2002; RCT study in 44 patients	median from RCT	no data	Median and range given. Authors reported no significant differences between groups (and shown on graph)	laparoscopy with 30 °C Trendelenberg position; Open surgery (laparotomy) with midline incision	age: mean 64 and 62 y (SD 8); range 18 min to 75 max); theatre temperature: 21-23°C, laminar flow, relative humidity 40-45%; ASA: I-II; no warming devices but fluids warmed; combined general / regional anaesthesia; duration: duration of surgery median 4.1h (range 3-5h) and 3 h (2-6h)	RCT, comparable at baseline for age, gender, weight, height, blood loss, crystalloid infusion. Duration of surgery was significantly longer in the laparoscopic group (mean difference 1.1 h)
<i>core temperature after 60 min in PACU</i>						
<i>laparoscopic procedure vs open procedure</i>						
Danelli 2002; RCT study in 44 patients	median from RCT	no data	Median and range given. Authors reported no significant differences between groups (and shown on graph)	laparoscopy with 30 °C Trendelenberg position; Open surgery (laparotomy) with midline incision	age: mean 64 and 62 y (SD 8); range 18 min to 75 max); theatre temperature: 21-23°C, laminar flow, relative humidity 40-45%; ASA: I-II; no warming devices but fluids warmed; combined general / regional anaesthesia; duration: duration of surgery median 4.1h (range 3-5h) and 3 h (2-6h)	RCT, comparable at baseline for age, gender, weight, height, blood loss, crystalloid infusion. Duration of surgery was significantly longer in the laparoscopic group (mean difference 1.1 h)

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s) Surgery risk factors: surgery: magnitude

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) intraoperative (any time)</i>						
<i>major surgery vs minor surgery</i>						
Flores-Maldonado 1997; prospective cohort study in 130 patients	multivariate adjusted odds ratio	2.8 (1.2, 6.3)	statistically significant, favours minor surgery	52 / 150 (35%) had major surgery (=opening of abdominal or chest cavities)	age: 5 to 90 y (mean 42 SD20); theatre temperature: mean 22.9 (SD 1.2)°C; ASA I 50%; ASA II 40%; ASA III / IV 10%; no warming mechanisms stated; mixed general / regional groups anaesthesia; duration: Mean surgical time 1.1h (SD 0.9) and 1.8 (SD 1.0)	age, gender, theatre temperature, duration of surgery, magnitude of surgery, blood transfusion, type of anaesthetic
<i>incidence of IPH (<36) in ICU</i>						
<i>intermediate magnitude of surgery vs minor surgery</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	6.6 (1.66, 26.19)	statistically significant, favours minor surgery, fairly wide confidence intervals	medium: body cavities exposed less than major (e.g. appendectomy) minor: superficial. 18% minor; 30% medium; 52% major	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)
<i>major surgery vs minor surgery</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	22.23 (5.41, 91.36)	larger statistically significant effect, favours minor surgery, fairly wide confidence intervals	Major surgery: body cavities / major vessels exposed (e.g. major abdominal, thoracic, major vascular, hip arthroplasty; minor: superficial	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in ICU</i>						
<i>intermediate magnitude of surgery vs minor surgery</i>						
Abelha 2005; prospective cohort study in 185 patients	multivariate adjusted odds ratio	3.6 (1.5, 9)	statistically significant, favours minor surgery	Medium: body cavities exposed less than major (e.g. appendectomy) minor: superficial. 20% minor; 24% medium; 56% major.	age: 66.0 y (SD 12.6), range 25 to 94; theatre temperature: 20-22°C (not adjusted for); ASA I 3%, ASA II 39%, ASA III 49%, ASA IV 10%; some had warming mechanisms; mixed general / regional / combined anaesthesia; duration: Anaesthesia duration: 3.6 h (SD 1.8) range 0.7 to 11h; 51% >3h	magnitude of surgery, iv crystalloids, preoperative patient temperature, SAPS II + adjusted for: anaesthesia type, anaesthesia duration, temperature monitoring, FAW, packed erythrocytes. Univariate: age, gender, body weight, BMI, ASA, emergency, iv colloids, plasma
<i>major surgery vs minor surgery</i>						
Abelha 2005; prospective cohort study in 185 patients	multivariate adjusted odds ratio	3.9 (1.4, 10.6)	statistically significant, favours minor surgery	Major surgery: body cavities / major vessels exposed (e.g. major abdominal, thoracic, major vascular, hip arthroplasty.	age: 66.0 y (SD 12.6), range 25 to 94; theatre temperature: 20-22°C (not adjusted for); ASA I 3%, ASA II 39%, ASA III 49%, ASA IV 10%; some had warming mechanisms; mixed general / regional / combined anaesthesia; duration: Anaesthesia duration: 3.6 h (SD 1.8) range 0.7 to 11h; 51% >3h	magnitude of surgery, iv crystalloids, preoperative patient temperature, SAPS II + adjusted for: anaesthesia type, anaesthesia duration, temperature monitoring, FAW, packed erythrocytes. Univariate: age, gender, body weight, BMI, ASA, emergency, iv colloids, plasma

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t) Surgery risk factors: surgery: elective

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) in ICU</i>						
<i>emergency surgery vs elective surgery</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	0.4 (0.09, 1.81)	not statistically significant	16% emergency surgery.	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)

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u) Surgery risk factors: patient position intraoperatively

Study name	Outcome	MD (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature at 30 min</i>						
<i>Head down tilt (Trendelenburg) vs supine</i>						
Nakajima 2002; RCT study in 16 patients	mean difference from RCT	-0.05°C (-0.41, 0.31)	from graph, 30 min approx, not significant difference, fairly wide confidence intervals, supine temperature 36.03°C	15-20 °C head down tilt (Trendelenburg) vs supine; positions initiated after 10 min of GA	age: mean 47 to 52 y (range 20-60); theatre temperature: Mean 23.9 to 24.2 (SD 0.4); relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general / regional anaesthesia; duration: Duration of anaesthesia about 3h	RCT, comparable at baseline for age, gender, height, weight, heart rate, arterial pressure, theatre temperature, fluids, sensory block, pre-induction temperature
<i>core temperature at 1h</i>						
<i>Head down tilt (Trendelenburg) vs supine</i>						
Nakajima 2002; RCT study in 16 patients	mean difference from RCT	-0.15°C (-0.51, 0.21)	from graph, 1h approx, not significant difference, fairly wide confidence intervals, supine temperature 35.83°C	15-20 °C head down tilt (Trendelenburg) vs supine; positions initiated after 10 min of GA	age: mean 47 to 52 y (range 20-60); theatre temperature: Mean 23.9 to 24.2 (SD 0.4); relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general / regional anaesthesia; duration: Duration of anaesthesia about 3h	RCT, comparable at baseline for age, gender, height, weight, heart rate, arterial pressure, theatre temperature, fluids, sensory block, pre-induction temperature

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Study name	Outcome	MD (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature at 2h</i>						
<i>Head down tilt (Trendelenburg) vs supine</i>						
Nakajima 2002; RCT study in 16 patients	mean difference from RCT	-0.42°C (-0.93, 0.21)	from graph, 2h approx, not significant difference, wide confidence intervals, supine temperature 35.59°C	15-20 °C head down tilt (Trendelenburg) vs supine; positions initiated after 10 min of GA	age: mean 47 to 52 y (range 20-60); theatre temperature: Mean 23.9 to 24.2 (SD 0.4); relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general / regional anaesthesia; duration: Duration of anaesthesia about 3h	RCT, comparable at baseline for age, gender, height, weight, heart rate, arterial pressure, theatre temperature, fluids, sensory block, pre-induction temperature
<i>Leg up + head down position vs supine</i>						
Nakajima 2002; RCT study in 16 patients	mean difference from RCT	-0.64°C (-1.09, -0.19)	from graph, 2h approx, statistically significant, favours supine position, fairly wide confidence intervals, supine temperature 35.59°C	leg up (lithotomy) + head down tilt position vs supine; positions initiated after 10 min of GA	age: mean 47 to 52 y (range 20-60); theatre temperature: Mean 23.9 to 24.2 (SD 0.4); relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general / regional anaesthesia; duration: Duration of anaesthesia about 3h	RCT, comparable at baseline for age, gender, height, weight, heart rate, arterial pressure, theatre temperature, fluids, sensory block, pre-induction temperature
<i>Leg up position vs supine</i>						
Nakajima 2002; RCT study in 16 patients	mean difference from RCT	-0.93°C (-1.52, -0.34)	from graph, 2h approx, statistically significant, favours supine position, wide confidence intervals, supine temperature 35.59°C	leg up (lithotomy) position vs supine; positions initiated after 10 min of GA	age: mean 47 to 52 y (range 20-60); theatre temperature: Mean 23.9 to 24.2 (SD 0.4); relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general/regional anaesthesia; duration: Duration of anaesthesia about 3h	RCT, comparable at baseline for age, gender, height, weight, heart rate, arterial pressure, theatre temperature, fluids, sensory block, pre-induction temperature

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Study name	Outcome	MD (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature at 3h</i>						
<i>Head down tilt (Trendelenburg) vs supine</i>						
Nakajima 2002; RCT study in 16 patients	mean difference from RCT	-0.2°C (-0.76, 0.36)	from text; 30 min approx, not significant difference, wide confidence intervals, supine temperature 35.20°C	15-20 °C head down tilt (Trendelenburg) vs supine; positions initiated after 10 min of GA	age: mean 47 to 52 y (range 20-60); theatre temperature: Mean 23.9 to 24.2 (SD 0.4); relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general/regional anaesthesia; duration: Duration of anaesthesia about 3h	RCT, comparable at baseline for age, gender, height, weight, heart rate, arterial pressure, theatre temperature, fluids, sensory block, pre-induction temperature
<i>Leg up + head down position vs supine</i>						
Nakajima 2002; RCT study in 16 patients	mean difference from RCT	-0.9°C (-1.46, -0.34)	statistically significant, favours supine position, wide confidence intervals, supine temperature 35.20°C	leg up (lithotomy) + head down tilt position vs supine; positions initiated after 10 min of GA	age: mean 47 to 52 y (range 20-60); theatre temperature: Mean 23.9 to 24.2 (SD 0.4); relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general/regional anaesthesia; duration: Duration of anaesthesia about 3h	RCT, comparable at baseline for age, gender, height, weight, heart rate, arterial pressure, theatre temperature, fluids, sensory block, pre-induction temperature
<i>Leg up position vs supine</i>						
Nakajima 2002; RCT study in 16 patients	mean difference from RCT	-1°C (-1.56, -0.44)	statistically significant, favours supine position, wide confidence intervals, supine temperature 35.20°C	leg up (lithotomy) position vs supine; positions initiated after 10 min of GA	age: mean 47 to 52 y (range 20-60); theatre temperature: Mean 23.9 to 24.2 (SD 0.4); relative humidity 40%; ASA: I-II; no warming mechanisms stated; combined general/regional anaesthesia; duration: Duration of anaesthesia about 3h	RCT, comparable at baseline for age, gender, height, weight, heart rate, arterial pressure, theatre temperature, fluids, sensory block, pre-induction temperature

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v) Other risk factors: IV fluids volume

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) in ICU</i>						
<i>volume of IV fluid > 4000ml vs total IV fluid ≤4000ml</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	1.24 (0.38, 4.02)	not significant	Fluids range 100 to 11,200ml. 72.5% had ≤ 4000ml; fluid temperature not stated.	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)
<i>change in temperature</i>						
<i>IV fluid volume as continuous variable</i>						
Hind 1994a; prospective cohort study in 30 patients	beta from regression (standardised)	no data	'Drop in oesophageal temperature' - probably maximum drop. Not significant in analysis 1: negative correlations with age.	730 ml (SD 223.8); 140-1250 ml. Fluids at room temperature. NB correlations with age	age: 51.43 y (SD 12.01); range 37 to 76; theatre temperature: 21.3°C (SD 1.2); 19.6-23.3. RH: 56% (4); 50-65; ASA: not stated; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1-2h	1 of 2 multivariate analyses that fitted the data. Factors included: age, theatre temperature, body fat index, iv fluids, and total blood loss (chosen from univariate correlations). Excluded: surgery duration, theatre humidity. Constant: type of anaesthesia.

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w) Patient risk factors: IV crystalloids volume

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in ICU</i>						
<i>IV crystalloids volume as continuous variable</i>						
Abelha 2005; prospective cohort study in 185 patients	multivariate adjusted odds ratio	1.4 (1.1, 1.7)	statistically significant, favours lower volumes	2.85 litre (SD 1.65) range 0.20 to 10.50; authors stated fluid warming was not known.	age: 66.0 y (SD 12.6), range 25 to 94; theatre temperature: 20-22°C (not adjusted for); ASA I 3%, ASA II 39%, ASA III 49%, ASA IV 10%; some had warming mechanisms; mixed general / regional / combined anaesthesia; duration: Anaesthesia duration: 3.6 h (SD 1.8) range 0.7 to 11h; 51% >3h	magnitude of surgery, iv crystalloids, preoperative patient temperature, SAPS II + adjusted for: anaesthesia type, anaesthesia duration, temperature monitoring, FAW, packed erythrocytes. Univariate: age, gender, body weight, BMI, ASA, emergency, iv colloids, plasma

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x) Other risk factors: irrigation fluid volume

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in PACU</i>						
<i>irrigation fluids >20 litre vs irrigation fluid ≤20 litre</i>						
Vorakitpokatorn 2006; prospective cohort study in 128 patients	multivariate adjusted odds ratio	7.42 (2.13, 25.94)	large statistically significant effect, favours lower volume	Irrigation fluid 24.1 litre (SD 16.36), range 5 to 97; 42% had >20 liters. Room temperature irrigation fluid.	age: 48.9 y (SD 13.54); 12.5% >65y; theatre temperature: not stated; ASA I 59%; ASA II 31%; ASA III 9%; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 2h (SD 0.8); 44% had >2h	age, duration of surgery, volume of irrigation fluid, blood transfusion units

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y) Other risk factors: packed erythrocytes

Study name	Outcome	beta (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in ICU</i>						
<i>packed erythrocytes units as continuous variable</i>						
Abelha 2005; prospective cohort study in 185 patients	multivariate adjusted odds ratio	no data	packed erythrocytes adjusted for in multivariate analysis but no results given	0.7 (SD 1.3) range 0 to 7; warming not stated.	age: 66.0 y (SD 12.6), range 25 to 94; theatre temperature: 20-22°C (not adjusted for); ASA I 3%, ASA II 39%, ASA III 49%, ASA IV 10%.; some had warming mechanisms; mixed general / regional / combined anaesthesia; duration: Anaesthesia duration: 3.6 h (SD 1.8) range 0.7 to 11h; 51% >3h	magnitude of surgery, iv crystalloids, preoperative patient temperature, SAPS II + adjusted for: anaesthesia type, anaesthesia duration, temperature monitoring, FAW, packed erythrocytes. Univariate: age, gender, body weight, BMI, ASA, emergency, iv colloids, plasma

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z) Other risk factors: blood transfusion

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) intraoperative (any time)</i>						
<i>blood transfusion vs no transfusion</i>						
Flores-Maldonado 1997; prospective cohort study in 130 patients	multivariate adjusted odds ratio	6.7 (1.5, 29)	statistically significant, favours no blood transfusion, fairly wide confidence intervals	13 / 130 (10%) had blood transfusion during surgery. Blood not warmed (4°C).	age: 5 to 90 y (mean 42 SD20); theatre temperature: mean 22.9 (SD 1.2)°C; ASA I 50%; ASA II 40%; ASA III & IV 10%; no warming mechanisms stated; mixed general / regional groups anaesthesia; duration: Mean surgical time 1.1h (SD 0.9) and 1.8 (SD 1.0)	age, gender, theatre temperature, duration of surgery, magnitude of surgery, blood transfusion, type of anaesthetic
<i>incidence of IPH (<35) in PACU</i>						
<i>blood transfusion vs no transfusion</i>						
Vorakitpokatorn 2006; prospective cohort study in 128 patients	multivariate adjusted odds ratio	0.8 (0.21, 3.07)	not significant	Need for blood transfusion was 16% and max transfusion was 2 units in 7.6%. Temperature not stated.	age: 48.9 y (SD 13.54); 12.5% >65y; theatre temperature: not stated; ASA I 59%; ASA II 31%; ASA III 9%; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 2h (SD 0.8); 44% had >2h	age, duration of surgery, volume of irrigation fluid, blood transfusion units
<i>change in temperature</i>						
<i>blood transfusion as continuous variable</i>						
Frank 1992; prospective cohort study in 97 patients	beta from regression (standardised)	no data	not significant	0.7 to 1.2 units; blood warmed to infusion temperature of 30-33°C	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no warming devices but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in OR: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)	ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii)

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>time to rewarm to 36°C</i>						
<i>blood transfusion as continuous variable</i>						
Frank 1992; prospective cohort study in 97 patients	beta from regression (standardised)	no data	not significant	0.7 to 1.2 units; blood warmed to infusion temperature of 30-33°C	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no warming devices but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in OR: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)	ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii)

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aa) Other risk factors: blood loss

Study name	Outcome	beta (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>change in temperature</i>						
<i>blood loss as continuous variable</i>						
Hind 1994a; prospective cohort study in 30 patients	beta from regression (standardised)	no data	'Drop in oesophageal temperature' - probably maximum drop. Not significant in analysis 1: negative correlations with age.	140.5 ml (SD 77.2); 60-325 ml. NB correlations with age	age: 51.43 y (SD 12.01); range 37 to 76; theatre temperature: 21.3°C (SD 1.2); 19.6-23.3. RH: 56% (4); 50-65; ASA: not stated; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1-2h	1 of 2 multivariate analyses that fitted the data. Factors included: age, theatre temperature, body fat index, iv fluids, total blood loss (chosen from univariate correlations). Excluded: surgery duration, theatre humidity. Constant: type of anaesthesia.

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bb) Other risk factors: warming mechanism

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in ICU</i>						
<i>warming mechanism used vs no warming mechanism</i>						
Abelha 2005; prospective cohort study in 185 patients	multivariate adjusted odds ratio	no data	warming technique adjusted for in multivariate analysis but no results given	44% had warming technique.	age: 66.0 y (SD 12.6), range 25 to 94; theatre temperature: 20-22°C (not adjusted for); ASA I 3%, ASA II 39%, ASA III 49%, ASA IV 10%; some had warming mechanisms; mixed general / regional / combined anaesthesia; duration: Anaesthesia duration: 3.6 h (SD 1.8) range 0.7 to 11h; 51% >3h	magnitude of surgery, iv crystalloids, preoperative patient temperature, SAPS II + adjusted for: anaesthesia type, anaesthesia duration, temperature monitoring, FAW, packed erythrocytes. Univariate: age, gender, body weight, BMI, ASA, emergency, iv colloids, plasma

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cc) Other risk factors: temperature monitoring

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) in ICU</i>						
<i>temperature monitoring not used vs temperature monitoring used</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	3 (0.89, 10.12)	not significant	29% had monitoring, BUT disproportionate across surgical specialties: orthopaedic 29%, general 58%.	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤ 2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temp

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dd) Other risk factors: particular hospital

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<35) in PACU</i>						
<i>hospital Y vs hospitals other than Y</i>						
Lau 2001; prospective cohort study in 18759 patients	multivariate adjusted odds ratio	2.46 (1.08, 5.61)	statistically significant; favours other hospitals	one of the 23 hospitals	age: 13% <15y; 62% 15-64; 24% >65; theatre temperature: not stated; ASA I 52%; ASA II 33%; ASA III 8%; ASA IV 2%; ASA V 0.3%; not identified 4%; warming mechanism not stated; mixed general / regional / combined anaesthesia; duration: Surgery duration for all patients >2h, but no details	age, ASA grade, type of anaesthesia, hospital. All of these were categorical variables.

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ee) Environmental risk factors: theatre temperature

Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>incidence of IPH (<36) intraoperative (any time)</i>						
<i>average ambient temperature as continuous variable</i>						
Flores-Maldonado 1997; prospective cohort study in 130 patients	multivariate adjusted odds ratio	0.61 (0.42, 0.89)	statistically significant, favours higher theatre temperatures	22.9 (SD 1.2) °C.	age: 5 to 90 y (mean 42 SD20); theatre temperature: mean 22.9 (SD 1.2)°C; ASA I 50%; ASA II 40%; ASA III / IV 10%; no warming mechanisms stated; mixed general / regional groups anaesthesia; duration: Mean surgical time 1.1h (SD 0.9) and 1.8 (SD 1.0)	age, gender, theatre temperature, duration of surgery, magnitude of surgery, blood transfusion, type of anaesthetic
<i>incidence of IPH (<36) in ICU</i>						
<i>average ambient temperature as continuous variable</i>						
Kongsayreepong 2003; prospective cohort study in 184 patients	multivariate adjusted odds ratio	0.67 (0.51, 0.88)	statistically significant, favours higher ambient temperature	Normothermic group 20.6°C (SD 1.8); hypothermic 19.5 (SD 1.9).	age: 15-93; theatre temperature: mean 19.5 to 20.6°C (SD 1.9); 19% ASA I; 55% ASA II; 26% ASA > II; some had active warming; mixed general / regional / combined anaesthesia; duration: Anaesthesia: range 0.5 to 11.5h. 19% had ≤2h.	age, body weight, preoperative body temperature, ASA, diabetic neuropathy, emergency surgery, magnitude of surgery, temperature monitoring used, type of anaesthesia, iv fluid, duration surgery, ambient temperature (+ univariate: gender, FAW, duration of anaesthesia)
<i>core temperature at 30 min</i>						
<i>warm theatre 21-24°C vs cool theatre 18-21°C</i>						
Morris 1971; prospective cohort study in 22 patients	baseline comparable mean difference	0.53°C (0.23, 0.83)	from graph, statistically significant, favours higher theatre temperature, cool theatre core temperature 36.0°C; fairly wide confidence intervals	Theatre temperature: cool theatre 18-21°C; warm theatre 21-24°C	age: mean 53 y (23 to 85); theatre temperature: cool theatre 18-21°C; warm theatre 21-24°C; ; no warming mechanisms stated; general anaesthesia; duration: duration of surgery at least 2 h	sub group analysis for age, theatre temperature, operative site and fluids infused. No significant difference in age or volume of fluids infused or site of op between lower and higher temperature theatres. Type of anaesthesia constant; surgery >2h. Number of events / number of covariates = 20 / 1 = 20

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>core temperature at 1h</i>						
<i>warm theatre 21-24°C vs cool theatre 18-21°C</i>						
Morris 1971; prospective cohort study in 22 patients	baseline comparable mean difference	0.6°C (0.3, 0.9)	from text, statistically significant, favours higher theatre temperature, cool theatre core temperature 35.6°C; fairly wide confidence intervals	Theatre temperature: cool theatre 18-21°C; warm theatre 21-24°C	age: mean 53 y (23 to 85); theatre temperature: cool theatre 18-21°C; warm theatre 21-24°C; ; no warming mechanisms stated; general anaesthesia; duration: duration of surgery at least 2 h	sub group analysis for age, theatre temperature, operative site and fluids infused. No significant difference in age or volume of fluids infused or site of op between lower and higher temperature theatres. Type of anaesthesia constant; surgery >2h. Number of events / number of covariates = 20 / 1 = 20
<i>core temperature at 2h</i>						
<i>warm theatre 21-24°C vs cool theatre 18-21°C</i>						
Morris 1971; prospective cohort study in 22 patients	baseline comparable mean difference	0.8°C (0.47, 1.13)	from text, statistically significant, favours higher theatre temperature, cool theatre core temperature 35.4°C; fairly wide confidence intervals	Theatre temperature: cool theatre 18-21°C; warm theatre 21-24°C	age: mean 53 y (23 to 85); theatre temperature: cool theatre 18-21°C; warm theatre 21-24°C; ; no warming mechanisms stated; general anaesthesia; duration: duration of surgery at least 2 h	sub group analysis for age, theatre temperature, operative site and fluids infused. No significant difference in age or volume of fluids infused or site of op between lower and higher temperature theatres. Type of anaesthesia constant; surgery >2h. Number of events / number of covariates = 20 / 1 = 20
<i>core temperature in PACU</i>						
<i>theatre temperature as continuous variable</i>						
Frank 2000; prospective cohort study in 44 patients	B from regression (non-standardised)	no data	not statistically significant; p=0.70	Ambient theatre temperature mean 20.9°C (SD 0.13) range 18.7 to 22.9.	age: 57y (SD 7) range 47-67.; theatre temperature: mean 20.9°C (SD 0.13) range 18.7 to 22.9.; ASA: not stated or considered; no warming devices but fluids warmed; spinal anaesthesia; duration: Duration of surgery: mean 1.5 h (SD 0.9) range 1.1 to 2.6	age, duration of surgery, theatre temperature, body mass, % body fat, height of spinal blockage (+ univariate BMI)

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Study name	Outcome	OR (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>change in temperature</i>						
<i>theatre temperature as continuous variable</i>						
Hind 1994a; prospective cohort study in 30 patients	B from regression (non-standardised)	-0.26 °C / °C	'Drop in oesophageal temperature' - probably maximum drop. Slope reported to be statistically significant, favouring higher theatre temperature (p<0.001)	21.3°C (SD 1.2); 19.6-23.3. NB correlations with age (older patients in theatre 1st when coldest)	age: 51.43 y (SD 12.01); range 37 to 76; theatre temperature: 21.3°C (SD 1.2); 19.6-23.3. RH: 56% (4); 50-65; ASA: not stated; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1-2h	1 of 2 multivariate analyses that fitted the data. Factors included: age, theatre temperature, body fat index, iv fluids, total blood loss (chosen from univariate correlations). Excluded: surgery duration, theatre humidity. Constant: type of anaesthesia.
Hind 1994a; prospective cohort study in 30 patients	beta from regression (standardised)	-0.6°C	'Drop in oesophageal temperature' - probably maximum drop. Slope reported to be statistically significant, favouring higher theatre temperature (p<0.001)	21.3°C (SD 1.2); 19.6-23.3. NB correlations with age (older patients in theatre 1st when coldest)	age: 51.43 y (SD 12.01); range 37 to 76; theatre temperature: 21.3°C (SD 1.2); 19.6-23.3. RH: 56% (4); 50-65; ASA: not stated; no warming mechanisms stated; general anaesthesia; duration: Duration of surgery 1-2h	1 of 2 multivariate analyses that fitted the data. Factors included: age, theatre temperature, body fat index, iv fluids, total blood loss (chosen from univariate correlations). Excluded: surgery duration, theatre humidity. Constant: type of anaesthesia.
<i>warm theatre 24.5°C vs cool theatre 21°C</i>						
Frank 1992; prospective cohort study in 97 patients	beta from regression (standardised)	-2.11	Not statistically significant (p=0.07); difference between 'first intraoperative temperature, and preoperative temperature. Probably standardised coefficients.	Warm: 24.5°C (SD 0.4); cold 21.3 (0.3)	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no warming devices but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in theatre: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)	ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii)
<i>time to rewarm to 36°C</i>						
<i>warm theatre 24.5°C vs cool theatre 21°C</i>						
Frank 1992; prospective cohort study in 97 patients	beta from regression (standardised)	no data	not significant	Warm: 24.5°C (SD 0.4); cold 21.3 (0.3)	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no warming devices but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in theatre: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)	ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii)

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ff) Environmental risk factors: theatre temperature x age

Study name	Outcome	Beta (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>change in temperature</i>						
<i>theatre temperature x age as continuous variable</i>						
Frank 1992; prospective cohort study in 97 patients	beta from regression (standardised)	no data	not significant	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no warming devices but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in theatre: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)		ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii)

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gg) Environmental risk factors: theatre temperature x anaesthesia type

Study name	Outcome	Beta (95%CI)	Comments	Risk factor details	Other details	Factors adjusted for in multivariate analysis
<i>change in temperature</i>						
<i>type anaesthesia x theatre temperature as continuous variable</i>						
Frank 1992; prospective cohort study in 97 patients	beta from regression (standardised)	0.98	Statistically significant interaction between anaesthesia type and theatre temperature (p=0.03). Greater decrease in T for GA vs EA in a cold theatre.	General warm n=33; general cold n=21; epidural warm n=30; epidural cold n=13	age: 35 to 94y; mean 64.5, SD 1.1; theatre temperature: mean 20.9 (SD 0.13); range 18.7 to 22.9°C; ASA: not stated or considered; no warming devices but fluids warmed; RCT general / epidural anaesthesia; duration: Duration in theatre: general warm 6.6h (SD 0.5); GA cold 4.4 (0.3); epidural warm 5.1 (0.3); EA cold 5.5 (0.4)	ANOVA / multiple regression adjusted for (i) age (ii) type of anaesthesia (iii) theatre temperature, duration in operating room, volume of iv crystalloid, blood transfusion units. Also included were 3 interaction terms: (i) x (ii), (i) x (iii), (ii) x (iii)

APPENDIX G: American Society of Anesthesiologists (ASA)

Physical Status Classification System

- Class I** A normal healthy patient
- Class II** A patient with mild systemic disease
- Class III** A patient with severe systemic disease
- Class IV** A patient with severe systemic disease that is a constant threat to life
- Class V** A moribund patient who is not expected to survive without the operation
- Class VI** A declared brain-dead patient whose organs are being removed for donor purposes

Source: <http://www.asahq.org/clinical/physicalstatus.htm>

APPENDIX H: HEALTH ECONOMICS

Table 1: Parameter distributions used in the probabilistic sensitivity analysis (*Italics indicate values used in sensitivity analyses only*)*

Model parameter description	Point estimate	Probability distribution	Distribution parameters	Source
RR SWI	4.00	Lognormal	Mean = 1.39 SD = 0.48	Meta-analysis in the consequences review (section 8)
<i>RR Blood transfusion</i>	<i>1.19</i>	<i>Lognormal</i>	<i>Mean = 0.17</i> <i>SD = 0.15</i>	
RR MCE	2.2	Lognormal	Mean = 0.79 SD = 0.37	
RR Mechanical ventilation	1.58	Lognormal	Mean = 0.46 SD = 0.26	
<i>RR Pressure ulcer</i>	<i>1.87</i>	<i>Lognormal</i>	<i>Mean = 0.63</i> <i>SD = 0.40</i>	
Hospital length of stay	19%	Normal	Mean = 19% SD = 5.7%	
<i>PACU LoS sensitivity analysis (zero in basecase)</i>	<i>30 minutes</i>	<i>Normal</i>	<i>Mean = 30 minutes</i> <i>SD = 5.96</i>	
MCE baseline (age 50)	2.40%	Beta	$\alpha=24, \beta=991$	Polanczyk 2003
MCE baseline (age 70)	4.47%	Beta	$\alpha=60, \beta=1281$	
<i>MCE higher risk</i>	<i>4.47%</i>	<i>Beta</i>	<i>$\alpha=60, \beta=1281$</i>	
Infection baseline	3.00%	Beta	$\alpha=7194, \beta=232758$	Health Protection Agency 2006
<i>Infection baseline (higher risk)</i>	<i>9.21%</i>	<i>Beta</i>	<i>$\alpha=1317, \beta=12979$</i>	
Blood transfusion rate (proportion surgical)	40.7%	beta	$\alpha=3982, \beta=5792$	Wells 2002
<i>Blood transfusion rate for higher risk</i>	<i>31%</i>	<i>Beta</i>	<i>$\alpha=45, \beta=99$</i>	Consequences review (section 8)
Blood transfusion (mean units per transfusion)	2.28	Normal	Mean = 2.28 SD = 0.65 SD fitted to give lower 95% CI at 1 unit	Consequences review (section 8)
Mechanical ventilation baseline	0.27%	Beta	$\alpha=41, \beta=15018$	Rose 1996
<i>Mechanical ventilation, higher risk</i>	<i>11.7%</i>	<i>Beta</i>	<i>$\alpha=21, \beta=158$</i>	Consequences review (section 8)
Pressure ulcer baseline	1.80%	Beta	$\alpha= 78, \beta= 4255$	Clark 1994

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Pressure ulcer, higher risk	10.9%	Beta	$\alpha= 162, \beta= 1324,$	Consequences review (section 8)
MCE event mix in hypothermic patients	70% ischaemia, 20% cardiac arrest 10% Myocardial infarction	Dirichlet	(7,2,1)	Frank 1997
Population utility	Linear relationship with age	Multinomial	Intercept mean= 1.06, gradient mean= -0.004	HTA 2007
MCE utility decrease for MI and cardiac arrest	0.76	Beta	$\alpha= 427, \beta= 135$	HTA 2007
SWI utility	0.07	Beta	$\alpha= 122, \beta= 1614,$ Fitted to mean and sd of U diff	Whitehouse, 2002 and Shmueli, 1999
Additional LoS due to infection (major/medium)	11.37	Lognormal	Mean = 2.43 SD = 0.09	Coello 2005
Additional LoS due to infection (minor)	2.8	Lognormal	Mean = 0.45 SD = 0.05	Coello 2005
Ventilation duration	16 hours	Normal	Mean = 16 SD = 6	Frank 1995
Mechanical ventilation cost per day	£1,716	Lognormal	Mean = 7.45, SD = 0.18	Department of Health, 2006 (National Schedule of Reference Costs)
MCE costs per day (cardiac arrest)	£253	Lognormal	Mean = 5.53 SD = 0.20	
MCE costs per day (Myocardial infarction)	£186	Lognormal	Mean = 5.23 SD = 0.37	
MCE costs per day (Ischaemia)	£285	Lognormal	Mean = 5.65 SD = 0.40	
PACU cost per day	£1066	Lognormal	Mean = 6.97 SD = 0.29	
HLoS cost per day	£275	Lognormal	Mean = 5.62 SD = 0.34	
Pressure ulcer cost	£1064	Normal	Mean = 1064 SD = 54.08	Bennett 2004
Cost per unit of blood	£106	Lognormal	Mean = 4.67 SD = 0.13	Varney 2003
ASA risk (odds ratio) (ASA II vs I)	1.97	Lognormal	Mean = 0.68 SD = 0.26	Kongsayreepong 2003 and Lau 2001
ASA risk (odds ratio) (ASA >II vs I)	2.68	Lognormal	Mean = 0.99 SD = 0.33	

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Odds ratio for intermediate vs minor surgery	4.31	Lognormal	Mean = 1.46 SD = 0.47	Kongsayreepong 2003 and Abelha 2005
Odds ratio for major vs minor surgery	3.2	Lognormal	Mean = 1.16 SD = 0.42	Abelha 2005 and Flores-Maldonado 1997
Odds ratio for combined anaesthesia vs general or regional	2.86	Lognormal	Mean = 1.05 SD = 0.23	Kongsayreepong 2003 and Lau 2001
FAW cost, disposables	£15.02	Lognormal	Mean = 2.71 SD = 0.35	NHS Supply Chain
FAW cost, service / maintenance only	£0.61	Lognormal	Mean = -0.49 SD = 0.10 Fitted to range	Submitted data
<i>FAW cost, service / maintenance and purchase</i>	<i>£2.19</i>	<i>Lognormal</i>	<i>Mean = 0.79 SD = 0.07 Fitted to range</i>	Submitted data
Fluid warming cost	£9.45	Lognormal	Mean = 2.24 SD = 0.42	NHS Supply Chani
Fluid warming cost, service / maintenance only	£0.68	Lognormal	Mean = -0.39 SD = 0.16 Fitted to range	Submitted data
<i>Fluid warming cost, service / maintenance and purchase</i>	<i>£2.24</i>	<i>Lognormal</i>	<i>Mean = 0.80 SD = 0.08 Fitted to range</i>	Submitted data
Thermal insulation cost	£3.67	Lognormal	Mean = 1.30 SD = 0.20 Fitted to range	Submitted data and NHS Supply Chain
Hypothermia risk in cohort (before adjusting for risk factor prevalence)	40.7%	Regression coeff normally distributed to fit uncertainty due to sample size of cohort	Mean = -1.17 SD = 0.18 (33.5% - 49.3%)	Flores-Maldonado 1997
All RR for interventions	Various	Lognormal distribution	Fitted to 95%CI of meta-analysed RR	See Chapter 12, Table 5

*Abbreviations: RR, relative risk; SD, standard deviation; SWI, surgical wound infection; MCE, morbid cardiac events; PACU, post-anaesthetic care unit, LoS, length of stay; FAW, forced air warming

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Manufacturer and suppliers invited to provide cost data

Arizant UK

Armstrong Medical Ltd

Central Medical Supplies Ltd

Electro Concept

Fisher and Paykel healthcare

Geratherm Medical AG

Inditherm Medical

JMW Medical Ltd

KCI Medical Ltd

Kimal Plc

Kimberly-Clarke Health Care

Mediwrap Ltd

Pennine Health Care

Sarstedt Ltd

Smiths Medical

The Surgical Company Int

Tyco Healthcare

Vital Signs Ltd

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Table 2 Standardised data form sent to manufacturers and suppliers

Product name	Description	Purchase price and/or lease cost per annum	Life-expectancy*	List of associated disposables	Unit cost for each associated disposable item	Power consumption	Service/maintenance costs per annum

*please provide the life-expectancy of the device in terms of the number of expected uses before replacement

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APPENDIX I – DECLARATIONS OF INTEREST

Dr Ratan Alexander - Chair, Guideline Development Group		
Consultant Anaesthetist		
Interest		Industry / Organisation
Personal pecuniary	Paid for lecturing on National study days (PACE) on perioperative hypothermia	Actamed Ltd
	Honorarium received for lecturing on M&K Update Ltd on perioperative hypothermia	M&K Update Ltd
	Member of TEMPP, a European task force sponsored by Augustine Medical, which has carried out a European survey on practice of prevention of perioperative hypothermia. Paid an honorarium for attending meetings up to 4 times year.	Augustine Medical
Non-personal pecuniary	Received equipment for current study at a cost.	
Personal non-pecuniary	Met with Arizant's European manager (declared 8.12.6)	Arizant
	Approached by Arizant to lecture at European Conference in Autumn 2007 (declined)	Arizant
Personal family	None	
Dr John Andrzejowski: Consultant Anaesthetist		
Interest		Industry / Organisation
Personal pecuniary	None	
Non-personal pecuniary	Bairpaws warming system for a clinical trial	Arizant
	Loan of equipment (declared 3.11.7)	

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	Conducting study on pre warming	
Personal non-pecuniary	None	
Personal family	None	
Mrs Jane Bovey: Staff Nurse-Anaesthetics & Recovery		
Interest		Industry / Organisation
Personal pecuniary	None	
Non-personal pecuniary	None	
Personal non-pecuniary	Lead College Steward for Salisbury NHS Foundation Trust. Involves representing RCN members within the workplace in employment issues, promoting excellence in clinical practice, education & training, & providing support for health & safety representatives & learning representatives	Royal College of Nursing
Personal family	None	
Mr Peter Dziejowski: Consultant Plastic Surgeon		
Interest		Industry / Organisation
Personal pecuniary	None	
Non-personal pecuniary	None	
Personal non-pecuniary	None	
Personal family	None	
Mr Peter Gosling: Patient/Carer Representative		
Interest		Industry / Organisation
Personal pecuniary	None	

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Non-personal pecuniary	None	
Personal non-pecuniary	None	
Personal family	None	
Ms Shelley Gussin: University Tutor		
Interest		Industry / Organisation
Personal pecuniary	None	
Non-personal pecuniary	None	
Personal non-pecuniary	None	
Personal family	None	
Mr Mark Harper: Consultant Anaesthetist		
Interest		Industry / Organisation
Personal pecuniary	I have received fees for lecturing to theatre staff on perioperative hypothermia (2004: £1000)	Actamed
	Spoke at European meeting of Anaesthesiology in 2007: travel & accommodation funded by ESA (less than £1000)	ESA
Non-personal pecuniary	None	
Personal non-pecuniary	I have received non financial support for clinical trials (less than £1000)	Actamed, Inditherm
Personal family		
Professor John MacFie: Consultant General Surgeon		
Interest		Industry / Organisation
Personal pecuniary	None	

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Non-personal pecuniary	None	
Personal non-pecuniary	None	
Personal family	None	
Mr Mark Radford: Consultant Nurse/Associate Deputy Director of Nursing for R&E		
Interest		Industry / Organisation
Personal pecuniary	Paid for series of 5 lectures & workshops (£250 per session) on management of perioperative hypothermia (total = £1250)	Actamed Ltd
Non-personal pecuniary	None	
Personal non-pecuniary	None	
Personal family	None	
Dr Eileen Scott: Post Doc Research Fellow		
Interest		Industry / Organisation
Personal pecuniary	Consultancy & fee paid work	Huntleigh Healthcare, Actamed Ltd
	Advisory Capacity, lectures/educational events	Molnlycke Healthcare, Pegasus, Kimberly Clark, KCI
Non-personal pecuniary	I am a member of the Pan European Thermoregulatory Taskforce which receives commercial support from Arizant	Arizant International (previously Augustine Medical)
	Fee paid work for research assistants	Huntleigh Healthcare, Actamed Ltd
Personal non-pecuniary	None	
Personal family	None	

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Mrs Madeleine Wang: Patient/Carer Representative		
Interest		Industry / Organisation
Personal pecuniary	None	
Non-personal pecuniary	None	
Personal non-pecuniary	Chair of Patient Liaison Group	Royal College of Anaesthetists
	Council member (GB & Ireland)	Association of Paediatric Anaesthetists
Personal family	None	
Dr Ian Bullock: Director, NCC NSC		
Interest		Industry / Organisation
Personal pecuniary	None	
Non-personal pecuniary	None	
Personal non-pecuniary	None	
Personal family	None	
Miss Sarah Davis: Senior Health Economist, NCC NSC		
Interest		Industry / Organisation
Personal pecuniary	None	
Non-personal pecuniary	None	
Personal non-pecuniary	None	
Personal family	None	

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Ms Lakshmi Murthy: Research & Development Fellow, NCC NSC		
Interest		Industry / Organisation
Personal pecuniary	None	
Non-personal pecuniary	None	
Personal non-pecuniary	None	
Personal family	Sister works for Wyeth as an Information Specialist	Wyeth
Dr Maggie Westby: Senior Research & Development Fellow, NCC NSC		
Interest		Industry / Organisation
Personal pecuniary	None	
Non-personal pecuniary	None	
Personal non-pecuniary	None	
Personal family	None	