

## Intravenous fluid therapy in adults in hospital

### Search strategies

*Clinical Guideline <...>*

*Search strategies*

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## Appendices

### Appendix A: Literature search strategies

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Search strategies used for the IV fluid therapy guideline are outlined below and were run in accordance with the methodology in the NICE Guidelines Manual 2009.<sup>{NICE2009 /id}</sup> All searches were run up to 12 March 2013 unless otherwise stated. Any studies added to the databases after this date were not included unless specifically stated in the text. Where possible searches were limited to retrieve material published in English.

Searches for the **clinical reviews** were run in Medline (OVID), Embase (OVID) and the Cochrane Library (Wiley). Additional searches were run in CINAHL (EBSCOHost) and PsychInfo (Ovid) for some questions. Usually, searches were constructed in the following way:

- A PICO format was used for **intervention** searches where population (P) terms were combined with intervention (I) and sometimes comparison (C) terms. An intervention can be a drug, a procedure or a diagnostic test. Outcomes (O) are rarely used in search strategies for interventions. Search filters were also added to the search where appropriate.
- A PEO format was used for **prognosis** searches where population (P) terms were combined with exposure (E) terms and sometimes outcomes (O). Search filters were added to the search where appropriate.

Searches for the **health economic reviews** were run in Medline (Ovid), Embase (Ovid), the NHS Economic Evaluations Database (NHS EED), the Health Technology Assessment (HTA) database and the Health Economic Evaluation Database (HEED). HTA and NHS EED searches were carried out via the Centre for Reviews and Dissemination (CRD) interface. Searches in NHS EED and HEED were constructed only using population terms. For Medline and Embase an economic filter (instead of a study type filter) was added to the same clinical search strategy.

## A.1 Population search strategies

Due to the broad scope of this guideline four different search populations were used, as appropriate to the focus of each question. The search strategies for the populations used are given below. In the section on searches for specific questions the population used is specified for each question.

### A.1.1 Fluid therapy population

#### Medline search terms

1	fluid therapy/
2	*water-electrolyte balance/
3	((fluid* or electrolyte*) adj3 (balance* or imbalance* or manag* or maint* or loss* or status or monit* or assess* or reassess* or evaluat* or re-evaluat* or reevaluat* or prescri* or document* or chart* or strateg* or regimen* or load* or require* or need*)).ti,ab.
4	((fluid* or volum* or electrolyte*) adj3 (therap* or intravenous* or iv or infusion* or drip or drips or administrat*)).ti,ab.
5	((fluid* or volume) adj2 overload*).ti,ab.
6	((fluid* or volum*) adj3 (restor* or resuscita* or replac* or deplet* or deficien*)).ti,ab.
7	(fluid* adj3 (challenge or bolus)).ti,ab.
8	or/1-7

#### Embase search terms

1	fluid therapy/
2	fluid balance/
3	((fluid* or electrolyte*) adj3 (balance* or imbalance* or manag* or maint* or loss* or status or monit* or assess* or reassess* or evaluat* or re-evaluat* or reevaluat* or prescri* or document* or chart* or strateg* or regimen* or load* or require* or need*)).ti,ab.
4	((fluid* or volum* or electrolyte*) adj3 (therap* or intravenous* or iv or infusion* or drip or drips or administrat*)).ti,ab.
5	*electrolyte balance/
6	fluid resuscitation/
7	((fluid* or volum*) adj3 (restor* or resuscita* or replac* or deplet* or deficien*)).ti,ab.

8	(fluid* adj3 (challenge or bolus)).ti,ab.
9	or/1-8

**Cochrane search terms**

#1	MeSH descriptor Fluid Therapy, this term only
#2	MeSH descriptor Water-Electrolyte Balance, this term only
#3	((fluid* or electrolyte*) NEAR/3 (balance* or imbalance* or manag* or maint* or loss* or status or monit* or assess* or reassess* or evaluat* or re-evaluat* or reevaluat* or prescri* or document* or chart* or strateg* or regimen* or load* or require* or need*)):ti,ab
#4	((fluid* or volum* or electrolyte*) NEAR/3 (therap* or intravenous* or iv or infusion* or drip or drips or administrat*)):ti,ab
#5	((fluid* or volum*) NEAR/3 (restor* or resuscita* or replac* or deplet* or deficien*)):ti,ab
#6	(fluid* NEAR/3 (challenge or bolus)):ti,ab
#7	((fluid* or volume) NEAR/2 overload*):ti,ab
#8	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7)

**CINAHL search terms**

S1	(MH "Fluid Therapy") OR (MH "Fluid Resuscitation") OR (MH "Intravenous Therapy")
S2	((fluid* or electrolyte*) n3 (therap* or substitut* or replac* or intravenous* or iv or infusion* or drip or drips or administrat*))
S3	((fluid* or blood) n1 volume)
S4	((fluid* or electrolyte*) n3 (balance* or imbalance* or manag* or maint* or loss* or status or monit* or assess* or reassess* or evaluat* or re-evaluat* or reevaluat* or prescri* or document* or chart* or strateg* or regimen* or load*))
S5	((fluid* or volum*) n3 (restor* or resuscita* or defici* or deplet* or challenge*))
S6	(MH "Fluid-Electrolyte Balance+")
S7	S1 or S2 or S3 or S4 or S5 or S6

**PsychInfo search terms**

1	((fluid* or electrolyte*) adj3 (therap* or substitut* or replac* or intravenous* or iv or infusion* or drip or drips or administrat*)):ti,ab.
2	((fluid* or blood) adj volume).ti,ab.
3	((fluid* or electrolyte*) adj3 (balance* or imbalance* or manag* or maint* or loss* or status or monit* or assess* or reassess* or evaluat* or re-evaluat* or reevaluat* or prescri* or document* or chart* or strateg* or regimen* or load*)):ti,ab.
4	((fluid* or volum*) adj3 (restor* or resuscita* or defici* or deplet* or challenge*)):ti,ab.
5	or/1-4

**A.1.2 Routine maintenance population****Medline search terms**

1	fluid therapy/
2	((fluid* or volum* or electrolyte*) adj3 (therap* or intravenous* or iv or infusion* or drip or drips or administrat*)):ti,ab.
3	((fluid* or electrolyte*) adj3 (balance* or imbalance* or manag* or maint* or loss* or status or monit* or assess* or evaluat* or re-evaluat* or reevaluat* or require* or need*)):ti,ab.
4	*water-electrolyte balance/
5	(euvo?emi* or normovo?emi*).ti,ab.
6	((nil or nothing) adj2 mouth) or nil-by-mouth).ti,ab.
7	insensible loss*.ti,ab.



8	((swallow* or drink*) adj2 (difficult* or problem* or unable)).ti,ab.
9	or/1-8

**Embase search terms**

1	fluid therapy/
2	fluid balance/
3	((fluid* or volum* or electrolyte*) adj3 (therap* or intravenous* or iv or infusion* or drip or drips or administrat*)).ti,ab.
4	((fluid* or electrolyte*) adj3 (balance* or imbalance* or manag* or maint* or loss* or status or monit* or assess* or evaluat* or re-evaluat* or reevaluat* or require* or need*)).ti,ab.
5	exp *electrolyte balance/
6	(euvol?emi* or normovol?emi*).ti,ab.
7	((nil or nothing) adj2 mouth) or nil-by-mouth).ti,ab.
8	insensible loss*.ti,ab.
9	((swallow* or drink*) adj2 (difficult* or problem* or unable)).ti,ab.
10	or/1-9

**Cochrane search terms**

#1	MeSH descriptor Fluid Therapy explode all trees
#2	((fluid* or volum* or electrolyte*) NEAR/3 (therap* or intravenous* or iv or infusion* or drip or drips or administrat*)).ti,ab
#3	((fluid* or electrolyte*) NEAR/3 (balance* or imbalance* or manag* or maint* or loss* or status or monit* or assess* or evaluat* or re-evaluat* or reevaluat* or require* or need*)).ti,ab
#4	MeSH descriptor Water-Electrolyte Balance explode all trees
#5	(euvol*emi* or normovol*emi*).ti,ab
#6	((nil or nothing) NEAR/2 mouth) or nil-by-mouth).ti,ab
#7	insensible loss*.ti,ab
#8	((swallow* or drink*) NEAR/2 (difficult* or problem* or unable)).ti,ab
#9	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8)

**CINAHL search terms**

S1	(MH "Fluid Therapy") OR (MH "Intravenous Therapy") OR (MH "Fluid-Electrolyte Balance+")
S2	((fluid* or electrolyte*) n3 (balance* or imbalance* or manag* or maint* or loss* or status or monit* or assess* or reassess* or evaluat* or re-evaluat* or reevaluat* or prescri* or document* or chart* or strateg* or regimen* or load* or require* or need*))
S3	((fluid* or volum* or electrolyte*) n3 (therap* or intravenous* or iv or infusion* or drip or drips or administrat*))
S4	euvolaemi* OR euvolemi* OR normovolaemi* OR normovolemi*
S5	((nil or nothing) n2 mouth) or nil-by-mouth)
S6	insensible loss*
S7	((swallow* or drink*) n2 (difficult* or problem* or unable))
S8	((fluid* or volume) n2 overload*)
S9	S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8

**A.1.3 Resuscitation population****Medline search terms**

1	exp shock/
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2	hypovolemia/
3	hypotension/
4	dehydration/
5	*fluid therapy/
6	((fluid* or volum*) adj3 (restor* or resuscita* or replac* or deplet* or deficien*)).ti,ab.
7	(fluid* adj3 (challenge or bolus)).ti,ab.
8	(hypotens* adj2 resuscit*).ti,ab.
9	((shock or resuscit* or hypotens* or dehydrate*) and fluid*).ti,ab.
10	(hypovol?emi* or sepsis syndrome* or circulatory failure*).ti,ab.
11	((circulatory or h?emodynamic) adj2 (failure* or insufficien* or abnormalit* or instability*)).ti,ab.
12	(shock or resuscit* or hypotens* or dehydrate*).ti.
13	exp perioperative care/
14	exp perioperative period/
15	((perioperativ* or intraoperativ* or postoperativ*) adj3 fluid*).ti,ab.
16	(volume adj2 (expand* or expansion* or substitut*)).ti,ab.
17	or/1-16

**Embase search terms**

1	exp *shock/
2	exp *hypovolemia/
3	exp *hypotension/
4	*dehydration/
5	fluid resuscitation/
6	*fluid therapy/
7	*fluid balance/
8	((fluid* or volum*) adj3 (restor* or resuscita* or replac* or deplet* or deficien*)).ti,ab.
9	(fluid* adj3 (challenge or bolus)).ti,ab.
10	(hypotens* adj2 resuscit*).ti,ab.
11	((shock or resuscit* or hypotens* or dehydrate*) and fluid*).ti,ab.
12	(hypovol?emi* or sepsis syndrome* or circulatory failure*).ti,ab.
13	((circulatory or h?emodynamic) adj2 (failure* or insufficien* or abnormalit* or instability*)).ti,ab.
14	(shock or resuscit* or hypotens* or dehydrate*).ti.
15	intraoperative period/ or perioperative period/ or postoperative period/ or preoperative period/
16	((perioperativ* or intraoperativ* or postoperativ*) adj3 fluid*).ti,ab.
17	(volume adj2 (expand* or expansion* or substitut*)).ti,ab.
18	or/1-17

**Cochrane search terms**

#1	MeSH descriptor Shock explode all trees
#2	MeSH descriptor Hypovolemia, this term only
#3	MeSH descriptor Hypotension, this term only
#4	MeSH descriptor Dehydration, this term only
#5	MeSH descriptor Fluid Therapy, this term only
#6	((fluid* or volum*) NEAR/3 (restor* or resuscita* or replac* or deplet* or deficien*)):ti,ab

#7	(fluid* NEAR/3 (challenge or bolus)):ti,ab
#8	(hypotens* NEAR/2 resuscit*):ti,ab
#9	((shock or resuscit* or hypotens* or dehydrate*) and fluid*):ti,ab
#10	(hypovol*emi* or sepsis syndrome* or circulatory failure*):ti,ab
#11	((circulatory or h*modynamic) NEAR/2 (failure* or insufficien* or abnormalit* or instability*)):ti,ab
#12	(shock or resuscit* or hypotens* or dehydrate*):ti
#13	MeSH descriptor Perioperative Care explode all trees
#14	MeSH descriptor Perioperative Period explode all trees
#15	((perioperativ* or intraoperativ* or postoperativ*) NEAR/3 fluid*):ti,ab
#16	(volume NEAR/2 (expand* or expansion* or substitut*)):ti,ab
#17	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16)

**CINAHL search terms**

S1	(MH "Shock+") OR (MH "Fluid Resuscitation") OR (MH "Hypervolemia Management (Iowa NIC)") OR (MH "Hypovolemia Management (Iowa NIC)") OR (MH "Hypotension") OR (MH "Altered Fluid Volume (NANDA) (Non-Cinahl)") OR (MH "Dehydration")
S2	((fluid* or volum*) n3 (restor* or resuscita* or replac* or deplet* or deficien*))
S3	(fluid* n3 (challenge or bolus))
S4	(hypotens* n2 resuscit*)
S5	((shock or resuscit* or hypotens* or dehydrate*) and fluid*)
S6	(hypovolemi* or hypovolaemi* or sepsis syndrome* or circulatory failure*)
S7	((circulatory or hemodynamic or haemodynamic) n2 (failure* or insufficien* or abnormalit* or instability*))
S8	TI shock OR TI resuscit* OR TI hypotens* OR TI dehydrate*
S9	S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8

**A.1.4 Replacement population****Medline search terms**

1	((fluid* or electrolyte*) adj2 loss*).ti,ab.
2	vomiting/
3	((vomit* or emesis) and (replace* or loss* or fluid* or electrolyte*)).ti,ab.
4	intubation, gastrointestinal/
5	(nasogastric adj2 (aspirat* or intubat*)).ti,ab.
6	exp intestinal obstruction/
7	((obstruct* or block*) adj3 (bowel* or intestin* or duoden* or jejun* or ileu* or ileal)).ti,ab.
8	duodenal neoplasms/ or ileal neoplasms/ or jejunal neoplasms/
9	((neoplasm* or cancer* or malignan*) adj3 (duoden* or jejun* or ileu* or ileal or (small adj (bowel* or intestin*))))).ti,ab.
10	jejunostomy/
11	jejunostom*.ti,ab.
12	intestinal fistula/
13	(fistula adj2 (intestin* or cholecystoduoden* or colovesical or enterocutaneous)).ti,ab.
14	drainage/
15	(drain* adj2 (postoperativ* or surgical)).ti,ab.

16	ileostomy/
17	ileostom*.ti,ab.
18	diarrhea/
19	(diarrhoea* or diarrhea*).ti,ab.
20	ureteral obstruction/
21	exp urethral obstruction/
22	polyuria/
23	exp diuresis/
24	((obstruct* or block*) adj3 (urin* or ureter* or urethr*)).ti,ab.
25	(polyuria* or hyperures* or diures* or natriures* or (urin* adj2 (excess* or loss*))).ti,ab.
26	or/1-25

**Embase search terms**

1	*vomiting/
2	((vomit* or emesis) and (replace* or loss* or fluid* or electrolyte*)).ti,ab.
3	gastric suction/
4	stomach intubation/
5	(nasogastric adj2 (aspirat* or intubat*)).ti,ab.
6	small intestine obstruction/
7	((obstruct* or block*) adj3 (bowel* or intestin* or duoden* or jejun* or ileu* or ileal)).ti,ab.
8	exp small intestine cancer/
9	((neoplasm* or cancer* or malignan*) adj3 (duoden* or jejun* or ileu* or ileal or (small adj (bowel* or intestin*))).ti,ab.
10	*ileostomy/ or *jejunostomy/
11	jejunostom*.ti,ab.
12	lleostom*.ti,ab.
13	intestine fistula/
14	(fistula adj2 (intestin* or cholecystoduoden* or colovesical or enterocutaneous)).ti,ab.
15	exp *surgical drainage/
16	(drain* adj2 (postoperativ* or surgical)).ti,ab.
17	exp *diarrhea/
18	(diarrhoea* or diarrhea*).ti,ab.
19	exp *urinary tract obstruction/
20	((obstruct* or block*) adj3 (urin* or ureter* or urethr*)).ti,ab.
21	polyuria/
22	exp *diuresis/
23	(polyuria* or hyperures* or diures* or natriures* or (urin* adj2 (excess* or loss*))).ti,ab.
24	((fluid* or electrolyte*) adj2 loss*).ti,ab.
25	or/1-24

**Cochrane search terms**

#1	MeSH descriptor Vomiting, this term only
#2	((vomit* or emesis) and (replace* or loss* or fluid* or electrolyte*)):ti,ab
#3	MeSH descriptor Intubation, Gastrointestinal, this term only
#4	(nasogastric NEAR/2 (aspirat* or intubat*)):ti,ab
#5	MeSH descriptor Intestinal Obstruction explode all trees

#6	((obstruct* or block*) NEAR/3 (bowel* or intestin* or duoden* or jejun* or ileu* or ileal)):ti,ab
#7	MeSH descriptor Duodenal Neoplasms, this term only
#8	MeSH descriptor Ileal Neoplasms, this term only
#9	MeSH descriptor Jejunal Neoplasms, this term only
#10	((neoplasm* or cancer* or malignan*) NEAR/3 (duoden* or jejun* or ileu* or ileal or (small NEXT (bowel* or intestin*)))):ti,ab
#11	MeSH descriptor Jejunostomy, this term only
#12	MeSH descriptor Ileostomy, this term only
#13	jejunostom*:ti,ab
#14	ileostom*:ti,ab
#15	MeSH descriptor Intestinal Fistula, this term only
#16	(fistula NEAR/2 (intestin* or cholecystoduoden* or colovesical or enterocutaneous)):ti,ab
#17	MeSH descriptor Drainage, this term only
#18	(drain* NEAR/2 (postoperativ* or surgical)):ti,ab
#19	MeSH descriptor Diarrhea, this term only
#20	(diarrhoea* or diarrhea*):ti,ab
#21	MeSH descriptor Ureteral Obstruction, this term only
#22	MeSH descriptor Urethral Obstruction explode all trees
#23	MeSH descriptor Polyuria, this term only
#24	MeSH descriptor Diuresis explode all trees
#25	((obstruct* or block*) NEAR/3 (urin* or ureter* or urethr*)):ti,ab
#26	(polyuria* or hyperures* or diures* or natriures* or (urin* NEAR/2 (excess* or loss*)):ti,ab
#27	((fluid* or electrolyte*) NEAR/2 loss*):ti,ab
#28	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27)

## A.2 Study filter search terms

### A.2.1 Systematic review search terms

#### Medline search terms

1	meta-analysis/
2	meta-analysis as topic/
3	(meta analy* or metanaly* or metaanaly*).ti,ab.
4	((systematic* or evidence*) adj2 (review* or overview*)):ti,ab.
5	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
6	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
7	(search* adj4 literature).ab.
8	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
9	cochrane.jw.
10	((indirect or mixed) adj2 comparison*).ti,ab.
11	or/1-10

#### Embase search terms

1	systematic review/
2	meta-analysis/
3	(meta analy* or metanaly* or metaanaly*).ti,ab.
4	((systematic or evidence) adj2 (review* or overview*)).ti,ab.
5	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
6	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
7	(search* adj4 literature).ab.
8	(medline or pubmed or cochrane or embase or psychlit or psychlit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
9	((pool* or combined) adj2 (data or trials or studies or results)).ab.
10	cochrane.jw.
11	((indirect or mixed) adj2 comparison*).ti,ab.
12	or/1-11

### A.2.2 Randomised controlled studies (RCTs) search terms

#### Medline search terms

1	randomized controlled trial.pt.
2	controlled clinical trial.pt.
3	randomi#ed.ab.
4	placebo.ab.
5	randomly.ab.
6	Clinical Trials as topic.sh.
7	trial.ti.
8	or/1-7

#### Embase search terms

1	random*.ti,ab.
2	factorial*.ti,ab.
3	(crossover* or cross over*).ti,ab.
4	((doubl* or singl*) adj blind*).ti,ab.
5	(assign* or allocat* or volunteer* or placebo*).ti,ab.
6	crossover procedure/
7	single blind procedure/
8	randomized controlled trial/
9	double blind procedure/
10	or/1-9

### A.2.3 Observational studies search terms

#### Medline search terms

1	epidemiologic studies/
2	exp case control studies/
3	exp cohort studies/
4	cross-sectional studies/
5	case control.ti,ab.

6	(cohort adj (study or studies or analys*)).ti,ab.
7	((follow up or observational or uncontrolled or non randomi#ed or nonrandomi#ed or epidemiologic*) adj (study or studies)).ti,ab.
8	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort*)).ti,ab.
9	or/1-8

**Embase search terms**

1	clinical study/
2	exp case control study/
3	family study/
4	longitudinal study/
5	retrospective study/
6	prospective study/
7	cross-sectional study/
8	cohort analysis/
9	follow-up/
10	cohort*.ti,ab.
11	9 and 10
12	case control.ti,ab.
13	(cohort adj (study or studies or analys*)).ti,ab.
14	((follow up or observational or uncontrolled or non randomi#ed or nonrandomi#ed or epidemiologic*) adj (study or studies)).ti,ab.
15	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort*)).ti,ab.
16	or/1-8,11-15

**A.2.4 Health economic search terms****Medline search terms**

1	economics/
2	value of life/
3	exp "costs and cost analysis"/
4	exp economics, hospital/
5	exp economics, medical/
6	economics, nursing/
7	economics, pharmaceutical/
8	exp "fees and charges"/
9	exp budgets/
10	budget*.ti,ab.
11	cost*.ti.
12	(economic* or pharmaco?economic*).ti.
13	(price* or pricing*).ti,ab.
14	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
15	(financ* or fee or fees).ti,ab.
16	(value adj2 (money or monetary)).ti,ab.
17	or/1-16

**Embase search terms**

1	*health economics/
2	exp *economic evaluation/
3	exp *health care cost/
4	exp *fee/
5	budget/
6	funding/
7	budget*.ti,ab.
8	cost*.ti.
9	(economic* or pharmaco?economic*).ti.
10	(price* or pricing*).ti,ab.
11	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
12	(financ* or fee or fees).ti,ab.
13	(value adj2 (money or monetary)).ti,ab.
14	or/1-13

**A.2.5 Quality of life search terms****Medline search terms**

1	quality-adjusted life years/
2	sickness impact profile/
3	(quality adj2 (wellbeing or well being)).ti,ab.
4	sickness impact profile.ti,ab.
5	disability adjusted life.ti,ab.
6	(qal* or qtime* or qwb* or daly*).ti,ab.
7	(euroqol* or eq5d* or eq 5*).ti,ab.
8	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.
9	(health utility* or utility score* or disutilit* or utility value*).ti,ab.
10	(hui or hui1 or hui2 or hui3).ti,ab.
11	(health* year* equivalent* or hye or hyes).ti,ab.
12	discrete choice*.ti,ab.
13	rosser.ti,ab.
14	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
15	(sf36* or sf 36* or short form 36* or shortform 36* or shortform36*).ti,ab.
16	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
17	(sf12* or sf 12* or short form 12* or shortform 12* or shortform12*).ti,ab.
18	(sf8* or sf 8* or short form 8* or shortform 8* or shortform8*).ti,ab.
19	(sf6* or sf 6* or short form 6* or shortform 6* or shortform6*).ti,ab.
20	or/1-19

**Embase search terms**

1	quality adjusted life year/
2	"quality of life index"/
3	short form 12/ or short form 20/ or short form 36/ or short form 8/
4	sickness impact profile/
5	(quality adj2 (wellbeing or well being)).ti,ab.



6	sickness impact profile.ti,ab.
7	disability adjusted life.ti,ab.
8	(qal* or qtime* or qwb* or daly*).ti,ab.
9	(euroqol* or eq5d* or eq 5*).ti,ab.
10	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.
11	(health utility* or utility score* or disutilit* or utility value*).ti,ab.
12	(hui or hui1 or hui2 or hui3).ti,ab.
13	(health* year* equivalent* or hye or hyes).ti,ab.
14	discrete choice*.ti,ab.
15	rosser.ti,ab.
16	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
17	(sf36* or sf 36* or short form 36* or shortform 36* or shortform36*).ti,ab.
18	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
19	(sf12* or sf 12* or short form 12* or shortform 12* or shortform12*).ti,ab.
20	(sf8* or sf 8* or short form 8* or shortform 8* or shortform8*).ti,ab.
21	(sf6* or sf 6* or short form 6* or shortform 6* or shortform6*).ti,ab.
22	or/1-21

### A.2.6 Excluded study designs and publication types

The following study designs and publication types were removed from retrieved results using the NOT operator.

#### Medline search terms

1	letter/
2	editorial/
3	news/
4	exp historical article/
5	anecdotes as topic/
6	comment/
7	case report/
8	(letter or comment*).ti.
9	or/1-8
10	randomized controlled trial/ or random*.ti,ab.
11	9 not 10
12	animals/ not humans/
13	animals, laboratory/
14	exp animal experiment/
15	exp animal model/
16	exp rodentia/
17	(rat or rats or mouse or mice).ti.
18	or/11-17

#### Embase search terms

1	letter.pt. or letter/
2	note.pt.
3	editorial.pt.

4	case report/ or case study/
5	(letter or comment*).ti.
6	or/1-5
7	randomized controlled trial/ or random*.ti,ab.
8	6 not 7
9	animal/ not human/
10	nonhuman/
11	exp animal experiment/
12	exp experimental animal/
13	animal model/
14	exp rodent/
15	(rat or rats or mouse or mice).ti.
16	or/8-15

**Cinahl search terms**

S1	PT anecdote or PT audiovisual or PT bibliography or PT biography or PT book or PT book review or PT brief item or PT cartoon or PT commentary or PT computer program or PT editorial or PT games or PT glossary or PT historical material or PT interview or PT letter or PT listservs or PT masters thesis or PT obituary or PT pamphlet or PT pamphlet chapter or PT pictorial or PT poetry or PT proceedings or PT "questions and answers" or PT response or PT software or PT teaching materials or PT website
----	--

## A.3 Searches by specific questions

### A.3.1 Algorithms

**What is the clinical and cost effectiveness of clinical algorithms or defined protocols for the assessment, monitoring and/or management of intravenous fluid and electrolyte requirement in hospitalised adult patients?**

Search constructed by combining the columns in the following table using the AND Boolean operator

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Fluid therapy	Algorithms		Exclusions SRs RCTs	No date restriction. Search run up to 12 March 2013.

**Algorithms search terms****Medline search terms**

1	algorithms/
2	clinical protocols/
3	critical pathways/
4	algorithm*.ti,ab.
5	((protocol* or path* or plan*) adj3 (patient* or treat* or clinical* or fluid* or critical*)).ti,ab.
6	(goal* adj1 direct*).ti,ab.
7	or/1-6

**Embase search terms**

1	exp algorithm/
2	clinical protocol/
3	clinical pathway/
4	algorithm*.ti,ab.
5	((protocol* or path* or plan*) adj3 (patient* or treat* or clinical* or fluid* or critical*)).ti,ab.
6	(goal* adj1 direct*).ti,ab.
7	or/1-6

### Cochrane search terms

#1	MeSH descriptor Algorithms, this term only
#2	MeSH descriptor Clinical Protocols, this term only
#3	MeSH descriptor Critical Pathways, this term only
#4	algorithm*:ti,ab
#5	((protocol* or path* or plan*) NEAR/3 (patient* or treat* or clinical* or fluid* or critical*)):ti,ab
#6	(goal* NEAR direct*):ti,ab
#7	(#1 OR #2 OR #3 OR #4 OR #5 OR #6)

### CINAHL search terms

S1	(MH "Algorithms") OR (MH "Decision Trees")
S2	(MH "Protocols+")
S3	algorithm* OR protocol* n3 patient* OR protocol* n3 treat* OR protocol* n3 clinical* OR protocol* n3 fluid* OR protocol* n3 critical* OR path* n3 patient* OR path* n3 treat* OR path* n3 clinical* OR path* n3 fluid* OR path* n3 critical* OR goal* n1 direct*
S4	S1 or S2 or S3

## A.3.2 Body weight

### In people in hospital receiving IV fluids, what is the clinical and cost effectiveness for measuring and recording serial body weight?

Search constructed by combining the columns in the following table using the AND Boolean operator

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Fluid therapy OR renal insufficiency, heart failure	Body weight		Exclusions SRs RCTs Observational	No date restriction. Search run up to 12 March 2013.

### Renal insufficiency, heart failure search terms

#### Medline search terms

1	exp renal insufficiency/
2	((kidney or renal) adj (failure* or injur* or insufficien* or dysfunction* or impair*)).ti,ab.
3	exp heart failure/
4	((heart or myocardial) adj2 (failure* or decompensat*)).ti,ab.
5	or/1-4
6	(water* or fluid* or volume or hydrat*).ti,ab.
7	5 and 6

**Embase search terms**

1	*kidney failure/ or *chronic kidney failure/
2	((kidney or renal) adj (failure* or injur* or insufficien* or dysfunction* or impair*)):ti,ab.
3	exp *heart failure/
4	((heart or myocardial) adj2 (failure* or decompensat*)):ti,ab.
5	or/1-4
6	(water* or fluid* or volume or hydrat*):ti,ab.
7	5 and 6

**Cochrane search terms**

#1	MeSH descriptor Renal Insufficiency explode all trees
#2	((kidney or renal) NEAR (failure* or injur* or insufficien* or dysfunction* or impair*)):ti,ab
#3	MeSH descriptor Heart Failure explode all trees
#4	((heart or myocardial) NEAR/2 (failure* or decompensat*)):ti,ab
#5	(#1 OR #2 OR #3 OR #4)
#6	(water* or fluid* or volume or hydrat*):ti,ab
#7	(#5 AND #6)

**CINAHL search terms**

S1	(MH "Renal Insufficiency+")
S2	((kidney or renal) n1 (failure* or injur* or insufficien* or dysfunction* or impair*))
S3	(MH "Heart Failure+")
S4	((heart or myocardial) n2 (failure* or decompensat*))
S5	S1 or S2 or S3 or S4
S6	(water* or fluid* or volume or hydrat*)
S7	S5 and S6

**Body weight search terms****Medline search terms**

1	body weight/
2	body weight changes/
3	(weigh* adj3 (body or measure* or daily or lean or change* or week* or day or serial)):ti,ab.
4	or/1-3

**Embase search terms**

1	*body weight/ or *lean body weight/ or *weight change/ or *weight fluctuation/ or *weight gain/ or *weight reduction/
2	(weigh* adj3 (body or measure* or daily or lean or change* or week* or day or serial)):ti,ab.
3	or/1-2

**Cochrane search terms**

#1	MeSH descriptor Body Weight, this term only
#2	MeSH descriptor Body Weight Changes explode all trees
#3	(weigh* NEAR/3 (body or measure* or daily or lean or change* or week* or day or serial)):ti,ab
#4	(#1 OR #2 OR #3)

**CINAHL search terms**

S1	(MH "Body Weight") OR (MH "Weight Gain") OR (MH "Weight Loss") OR (MH "Body Weights
----	---

	and Measures+")
S2	(MH "Body Weight Changes")
S3	(weigh* n3 (body or measure* or daily or lean or change* or week* or day or serial))
S4	S1 or S2 or S3

### A.3.3 Urinary output

**In people in hospital receiving intravenous fluids, what is the clinical and cost effectiveness of measuring and recording urine output in addition to recording standard parameters stated in NEWS to determine the need for intravenous fluid administration?**

Search constructed by combining the columns in the following table using the AND Boolean operator

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Resuscitation OR routine maintenance	Urinary output		Exclusions SRs RCTs Observational	No date restriction. Search run up to 12 March 2013.

#### Urinary output search terms

##### Medline search terms

1	*urodynamics/
2	*urination/
3	*urine/
4	(urin* adj3 (output* or volume* or record* or measur* or level* or amount* or monit* or protocol*)):ti,ab.
5	or/1-4

##### Embase search terms

1	urine volume/
2	*micturition/
3	(urin* adj3 (output* or volume* or record* or measur* or level* or amount* or monit* or protocol*)):ti,ab.
4	or/1-3

##### Cochrane search terms

#1	MeSH descriptor Urodynamics, this term only
#2	MeSH descriptor Urination, this term only
#3	MeSH descriptor Urine, this term only
#4	(urin* NEAR/3 (output* or volume* or record* or measur* or level* or amount* or monit* or protocol*)):ti,ab
#5	(#1 OR #2 OR #3 OR #4)

##### CINAHL search terms

S1	(MH "24-hour Urine Collection") OR (MH "Fluid Intake-Output Measures") OR (MM "Urination") OR (MM "Urine")
S2	(urin* n3 (output* or volume* or record* or measur* or level* or amount* or monit* or protocol*))
S3	S1 or S2

### A.3.4 Serum chloride

**In people in hospital who are receiving intravenous fluids, what is the incidence and clinical significance of hyperchloraemia or hypochloraemia?**

Search constructed by combining the columns in the following table using the AND Boolean operator

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Fluid therapy OR fluids	Hyperchloraemia/ hypochloraemia		Exclusions	No date restriction. Search run up to 12 March 2013.

#### Fluids search terms

##### Medline search terms

1	albumins/ or exp serum albumin/
2	hetastarch/
3	colloids/
4	dextrans/
5	exp hypertonic solutions/
6	exp plasma substitutes/
7	sodium bicarbonate/
8	potassium chloride/ or sodium chloride/
9	isotonic solutions/ or rehydration solutions/
10	(sodium or salin* or hartman* or ringer* or glucose or lactate* or acetate*).ti,ab.
11	(crystalloid* or isotonic).ti,ab.
12	(dextrose or potassium or bicarbonate).ti,ab.
13	(dextran or rescueflow).ti,ab.
14	(colloid* or hemacel* or haemacel* or hydrocolloid*).ti,ab.
15	(hypertonic or hyperhaes or hypotonic).ti,ab.
16	(albumin* or albumen* or alburnorm or octalbin or zenalb or flexbumin).ti,ab.
17	((balanced or physiologic*) adj (fluid* or solution*)).ti,ab.
18	(gelatin* or gelofusin* or geloplasma or geloflex or gelo or isoplex or volplex).ti,ab.
19	(starch* or hetastarch* or pentastarch* or pentaspan* or haes-steril or hemohes or hespan or elohaes or hexastarch* or tetrastarch* or tetraspan or venofundin or volulyte or voluven).ti,ab.
20	(plasmalyte or albutein or (plasma adj1 substitut*)).ti,ab.
21	or/1-20

##### Embase search terms

1	albumin/
2	exp albuminoid/
3	plasma substitute/ or dextran/ or dextran 40/ or dextran 60/ or dextran 70/ or gelatin succinate/ or gelatinol/ or hetastarch/
4	exp colloid/
5	hypertonic solution/
6	bicarbonate/
7	sodium chloride/

8	potassium chloride/
9	isotonic solution/
10	crystalloid/
11	(sodium or salin* or hartman* or ringer* or glucose or lactate* or acetate*).ti,ab.
12	(crystalloid* or isotonic).ti,ab.
13	(dextrose or potassium or bicarbonate).ti,ab.
14	(dextran or rescueflow).ti,ab.
15	(colloid* or hemacel* or haemacel* or hydrocolloid*).ti,ab.
16	(hypertonic or hyperhaes or hypotonic).ti,ab.
17	((balanced or physiologic*) adj (fluid* or solution*)).ti,ab.
18	(albumin* or albumen* or alburnorm or octalbin or zenalb or flexbumin).ti,ab.
19	(plasmalyte or albutein or (plasma adj1 substitut*)).ti,ab.
20	(gelatin* or gelofusin* or geloplasma or geloflex or gelo or isoplex or volplex).ti,ab.
21	(starch* or hetastarch* or pentastarch* or pentaspan* or haes-steril or hemohees or hespan or elohaes or hexastarch* or tetrastarch* or tetraspan or venofundin or volulyte or voluven).ti,ab.
22	or/1-21

### Cochrane search terms

#1	MeSH descriptor Albumins, this term only
#2	MeSH descriptor Serum Albumin explode all trees
#3	MeSH descriptor Hetastarch, this term only
#4	MeSH descriptor Colloids, this term only
#5	MeSH descriptor Dextrans, this term only
#6	MeSH descriptor Hypertonic Solutions explode all trees
#7	MeSH descriptor Plasma Substitutes explode all trees
#8	MeSH descriptor Sodium Bicarbonate, this term only
#9	MeSH descriptor Potassium Chloride, this term only
#10	MeSH descriptor Sodium Chloride, this term only
#11	MeSH descriptor Isotonic Solutions, this term only
#12	MeSH descriptor Rehydration Solutions, this term only
#13	(sodium or salin* or hartman* or ringer* or glucose or lactate* or acetate*).ti,ab
#14	(crystalloid* or isotonic):ti,ab
#15	(dextrose or potassium or bicarbonate):ti,ab
#16	(dextran or rescueflow):ti,ab
#17	(colloid* or hemacel* or haemacel* or hydrocolloid*):ti,ab
#18	(hypertonic or hyperhaes or hypotonic):ti,ab
#19	(albumin* or albumen* or alburnorm or octalbin or zenalb or flexbumin):ti,ab
#20	((balanced or physiologic*) NEAR (fluid* or solution*)):ti,ab
#21	(gelatin* or gelofusin* or geloplasma or geloflex or gelo or isoplex or volplex):ti,ab
#22	(starch* or hetastarch* or pentastarch* or pentaspan* or haes-steril or hemohees or hespan or elohaes or hexastarch* or tetrastarch* or tetraspan or venofundin or volulyte or voluven):ti,ab
#23	(plasmalyte or albutein or (plasma NEAR substitut*)):ti,ab
#24	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23)

### Hyperchloraemia/hypochloraemia search terms

**Medline search terms**

1	(hyperchlor?emi* or hypochlor?emi*).ti,ab.
---	--

**Embase search terms**

1	(hyperchlor?emi* or hypochlor?emi*).ti,ab.
2	hyperchloremia/
3	hypochloremia/
4	or/1-3

**Cochrane search terms**

#1	(hyperchlor*mi* or hypochlor*mi*):ti,ab
----	---

**A.3.5 Routine maintenance: fluid type****What is the most clinical and cost effective fluid to be used for intravenous fluid therapy for routine maintenance in hospitalised patients?**

Search constructed by combining the columns in the following table using the AND Boolean operator

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Routine maintenance	Maintenance fluids		Exclusions SRs RCTs Observational	No date restriction. Search run up to 12 March 2013.

**Maintenance fluids search terms****Medline search terms**

1	dextrans/
2	exp hypertonic solutions/
3	sodium bicarbonate/
4	sodium chloride/
5	isotonic solutions/ or rehydration solutions/
6	(sodium or salin* or hartman* or ringer* or lactate* or acetate* or plasmalyte).ti,ab.
7	(crystalloid* or isotonic).ti,ab.
8	(dextrose or bicarbonate).ti,ab.
9	(dextran or rescueflow).ti,ab.
10	(hypertonic or hypotonic).ti,ab.
11	((balanced or physiologic*) adj (fluid* or solution*)).ti,ab.
12	or/1-11

**Embase search terms**

1	hypertonic solution/
2	*bicarbonate/
3	*sodium chloride/
4	isotonic solution/
5	crystalloid/
6	(sodium or salin* or hartman* or ringer* or lactate* or acetate* or plasmalyte).ti,ab.
7	(crystalloid* or isotonic).ti,ab.



8	(dextrose or bicarbonate).ti,ab.
9	(dextran or rescueflow).ti,ab.
10	(hypertonic or hypotonic).ti,ab.
11	((balanced or physiologic*) adj (fluid* or solution*)).ti,ab.
12	or/1-11

### Cochrane search terms

#1	MeSH descriptor Dextrans, this term only
#2	MeSH descriptor Hypertonic Solutions explode all trees
#3	MeSH descriptor Sodium Bicarbonate, this term only
#4	MeSH descriptor Sodium Chloride, this term only
#5	MeSH descriptor Isotonic Solutions, this term only
#6	MeSH descriptor Rehydration Solutions, this term only
#7	(sodium or salin* or hartman* or ringer* or lactate* or acetate* or plasmalyte):ti,ab
#8	(crystalloid* or isotonic):ti,ab
#9	(dextrose or bicarbonate):ti,ab
#10	(dextran or rescueflow):ti,ab
#11	(hypertonic or hypotonic):ti,ab
#12	((balanced or physiologic*) NEXT (fluid* or solution*)):ti,ab
#13	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12)

### A.3.6 Fluid volume and timing

Searches for the following four questions were run as one search:

**What is clinical and cost effectiveness of different volumes of fluid administration in patients requiring intravenous fluids for routine maintenance?**

**What are the most clinical and cost effective timings of administration of intravenous fluids in patients requiring intravenous fluids for routine maintenance?**

**What is clinical and cost effectiveness of different volumes of fluid administration in patients requiring fluid resuscitation?**

**What are the most clinically and cost effective timings and rate of administration of IV fluids in fluid resuscitation?**

Search constructed by combining the columns in the following table using the AND Boolean operator

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Resuscitation OR routine maintenance	Volume, timing		Exclusions SRs RCTs Observational (Observational filter used with resuscitation population only)	No date restriction. Search run up to 12 March 2013.

### Volume, timing search terms

### Medline search terms

1	time factors/
2	((rapid or fast* or slow*) adj3 (infus* or administ* or fluid* or volume)).ti,ab.
3	((small* or large* or high* or low*) adj3 volume).ti,ab.
4	((restrict* or conservativ* or liberal*) adj2 (fluid* or regime* or protocol* or intake*)).ti,ab.
5	((timing or delayed or intermediate or early or selective or rapid or immediate*) adj3 (fluid* or therap* or intravenous* or iv)).ti,ab.
6	or/1-5

**Embase search terms**

1	*time factors/
2	infusion rate/
3	((rapid or fast* or slow*) adj3 (infus* or administ* or fluid* or volume)).ti,ab.
4	((small* or large* or high* or low*) adj3 volume).ti,ab.
5	((restrict* or conservativ* or liberal*) adj2 (fluid* or regime* or protocol* or intake*)).ti,ab.
6	((timing or delayed or intermediate or early or selective or rapid or immediate*) adj3 (fluid* or therap* or intravenous* or iv)).ti,ab.
7	or/1-6

**Cochrane search terms**

#1	MeSH descriptor Time Factors, this term only
#2	((rapid or fast* or slow*) NEAR/3 (infus* or administ* or fluid* or volume)):ti,ab
#3	((small* or large* or high* or low*) NEAR/3 volume):ti,ab
#4	((restrict* or conservativ* or liberal*) NEAR/2 (fluid* or regime* or protocol* or intake*)):ti,ab
#5	((timing or delayed or intermediate or early or selective or rapid or immediate*) NEAR/3 (fluid* or therap* or intravenous* or iv)):ti,ab
#6	(#1 OR #2 OR #3 OR #4 OR #5)

**A.3.7 Resuscitation: fluid type****What is the most clinically and cost effective fluid for intravenous fluid resuscitation of hospitalised patients?**

Search constructed by combining the columns in the following table using the AND Boolean operator

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Resuscitation	Resuscitation fluids		Exclusions SRs RCTs	No date restriction. Search run up to 12 March 2013.

**Resuscitation fluids search terms****Medline search terms**

1	albumins/ or exp serum albumin/
2	hetastarch/
3	colloids/
4	dextrans/
5	exp hypertonic solutions/
6	exp plasma substitutes/
7	sodium bicarbonate/

8	potassium chloride/ or sodium chloride/
9	isotonic solutions/ or rehydration solutions/
10	(sodium or salin* or hartman* or ringer* or glucose or lactate* or acetate*).ti,ab.
11	(crystalloid* or isotonic).ti,ab.
12	(dextrose or potassium or bicarbonate).ti,ab.
13	(albumin* or albumen* or alburnorm or octalbin or zenalb or flexbumin).ti,ab.
14	(dextran or rescueflow).ti,ab.
15	(gelatin* or gelofusin* or geloplasma or geloflex or gelo or isoplex or volplex).ti,ab.
16	(starch* or hetastarch* or pentastarch* or pentaspan* or haes-steril or hemohes or hespan or elohaes or hexastarch* or tetrastarch* or tetraspan or venofundin or volulyte or voluven).ti,ab.
17	(colloid* or hemaccel* or haemaccel* or hydrocolloid*).ti,ab.
18	(hypertonic or hyperhaes or hypotonic).ti,ab.
19	((balanced or physiologic*) adj (fluid* or solution*)).ti,ab.
20	(plasmalyte or albutein or (plasma adj1 substitut*)).ti,ab.
21	or/1-20

**Embase search terms**

1	albumin/
2	exp albuminoid/
3	plasma substitute/ or dextran/ or dextran 40/ or dextran 60/ or dextran 70/ or gelatin succinate/ or gelatinol/ or hetastarch/
4	exp colloid/
5	hypertonic solution/
6	bicarbonate/
7	sodium chloride/
8	potassium chloride/
9	isotonic solution/
10	crystalloid/
11	(sodium or salin* or hartman* or ringer* or glucose or lactate* or acetate*).ti,ab.
12	(crystalloid* or isotonic).ti,ab.
13	(dextrose or potassium or bicarbonate).ti,ab.
14	(albumin* or albumen* or alburnorm or octalbin or zenalb or flexbumin).ti,ab.
15	(dextran or rescueflow).ti,ab.
16	(gelatin* or gelofusin* or geloplasma or geloflex or gelo or isoplex or volplex).ti,ab.
17	(starch* or hetastarch* or pentastarch* or pentaspan* or haes-steril or hemohes or hespan or elohaes or hexastarch* or tetrastarch* or tetraspan or venofundin or volulyte or voluven).ti,ab.
18	(colloid* or hemaccel* or haemaccel* or hydrocolloid*).ti,ab.
19	(hypertonic or hyperhaes or hypotonic).ti,ab.
20	((balanced or physiologic*) adj (fluid* or solution*)).ti,ab.
21	(plasmalyte or albutein or (plasma adj1 substitut*)).ti,ab.
22	or/1-21

**Cochrane search terms**

#1	MeSH descriptor Albumins, this term only
#2	MeSH descriptor Serum Albumin explode all trees

#3	MeSH descriptor Hetastarch, this term only
#4	MeSH descriptor Colloids, this term only
#5	MeSH descriptor Dextrans, this term only
#6	MeSH descriptor Hypertonic Solutions explode all trees
#7	MeSH descriptor Plasma Substitutes explode all trees
#8	MeSH descriptor Sodium Bicarbonate, this term only
#9	MeSH descriptor Potassium Chloride, this term only
#10	MeSH descriptor Sodium Chloride, this term only
#11	MeSH descriptor Isotonic Solutions, this term only
#12	MeSH descriptor Rehydration Solutions, this term only
#13	(sodium or salin* or hartman* or ringer* or glucose or lactate* or acetate*):ti,ab
#14	(crystalloid* or isotonic):ti,ab
#15	(dextrose or potassium or bicarbonate):ti,ab
#16	(albumin* or albumen* or alburnorm or octalbin or zenalb or flexbumin):ti,ab
#17	(dextran or rescueflow):ti,ab
#18	(gelatin* or gelofusin* or geloplasma or geloflex or gelo or isoplex or volplex):ti,ab
#19	(starch* or hetastarch* or pentastarch* or pentaspan* or haes-steril or hemohes or hespan or elohaes or hexastarch* or tetrastarch* or tetraspan or venofundin or volulyte or voluven):ti,ab
#20	(colloid* or hemaccel* or haemaccel* or hydrocolloid*):ti,ab
#21	(hypertonic or hyperhaes or hypotonic):ti,ab
#22	((balanced or physiologic*) NEAR (fluid* or solution*)):ti,ab
#23	(plasmalyte or albutein or (plasma NEAR substitut*)):ti,ab
#24	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23)

### A.3.8 Replacement: fluid type

#### What is the most clinical and cost effective fluid for intravenous fluid replacement in hospitalised patients?

Search constructed by combining the columns in the following table using the AND Boolean operator

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Replacement	Replacement fluids		Exclusions SRs RCTs Observational	No date restriction. Search run up to 12 March 2013.

#### Replacement fluids search terms

##### Medline search terms

1	dextrans/
2	exp hypertonic solutions/
3	sodium chloride/
4	isotonic solutions/ or rehydration solutions/
5	(sodium chloride or salin* or hartman* or ringer* or lactate* or acetate* or plasmalyte).ti,ab.
6	(crystalloid* or isotonic).ti,ab.
7	(dextran or dextrose or rescueflow).ti,ab.

8	(hypertonic or hypotonic).ti,ab.
9	((balanced or physiologic*) adj (fluid* or solution*)).ti,ab.
10	or/1-9
11	exp *analgesics/ or exp *anesthesia/ or exp *anesthetics/
12	10 not 11

**Embase search terms**

1	hypertonic solution/
2	*sodium chloride/
3	isotonic solution/
4	crystalloid/
5	(sodium chloride or salin* or hartman* or ringer* or lactate* or acetate* or plasmalyte).ti,ab.
6	(crystalloid* or isotonic).ti,ab.
7	(dextran or dextrose or RescueFlow).ti,ab.
8	(hypertonic or hypotonic).ti,ab.
9	((balanced or physiologic*) adj (fluid* or solution*)).ti,ab.
10	or/1-9
11	exp *analgesic agent/
12	exp *anesthetic agent/
13	exp *anesthesia/
14	or/11-13
15	10 not 14

**Cochrane search terms**

#1	MeSH descriptor Dextrans, this term only
#2	MeSH descriptor Hypertonic Solutions explode all trees
#3	MeSH descriptor Sodium Chloride, this term only
#4	MeSH descriptor Isotonic Solutions, this term only
#5	MeSH descriptor Rehydration Solutions, this term only
#6	(sodium chloride or salin* or hartman* or ringer* or lactate* or acetate* or plasmalyte):ti,ab
#7	(crystalloid* or isotonic):ti,ab
#8	(dextran or dextrose or RescueFlow):ti,ab
#9	(hypertonic or hypotonic):ti,ab
#10	((balanced or physiologic*) NEAR (fluid* or solution*)):ti,ab
#11	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10)

**A.3.9 Replacement: volume and timing**

Searches for the following two questions were run as one search:

**What is clinical and cost effectiveness of different volumes of fluid administration in patients requiring fluid replacement for ongoing losses?**

**What are the most clinical and cost effective timings for the administration of IV fluid replacement for ongoing losses?**

Search constructed by combining the columns in the following table using the AND Boolean operator

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Replacement	Volume, timing		Exclusions SRs RCTs Observational	No date restriction. Search run up to 12 March 2013.

### Volume, timing search terms

#### Medline search terms

1	time factors/
2	fluid therapy/
3	1 and 2
4	((rapid or fast* or slow*) adj3 (infus* or administ* or fluid* or volume)).ti,ab.
5	((small* or large* or high* or low*) adj3 volume).ti,ab.
6	((restrict* or conservativ* or liberal*) adj2 (fluid* or regime* or protocol* or intake*)).ti,ab.
7	((timing or delayed or intermediate or early or selective or rapid or immediate*) adj3 (fluid* or therap* or intravenous* or iv)).ti,ab.
8	or/3-7

#### Embase search terms

1	fluid therapy/
2	fluid balance/
3	or/1-2
4	time factors/
5	3 and 4
6	infusion rate/
7	((rapid or fast* or slow*) adj3 (infus* or administ* or fluid* or volume)).ti,ab.
8	((small* or large* or high* or low*) adj3 volume).ti,ab.
9	((restrict* or conservativ* or liberal*) adj2 (fluid* or regime* or protocol* or intake*)).ti,ab.
10	((timing or delayed or intermediate or early or selective or rapid or immediate*) adj3 (fluid* or therap* or intravenous* or iv)).ti,ab.
11	or/5-10

#### Cochrane search terms

#1	MeSH descriptor Time Factors, this term only
#2	MeSH descriptor Fluid Therapy, this term only
#3	(#1 AND #2)
#4	((rapid or fast* or slow*) NEAR/3 (infus* or administ* or fluid* or volume)):ti,ab
#5	((small* or large* or high* or low*) NEAR/3 volume):ti,ab
#6	((restrict* or conservativ* or liberal*) NEAR/2 (fluid* or regime* or protocol* or intake*))):ti,ab
#7	((timing or delayed or intermediate or early or selective or rapid or immediate*) NEAR/3 (fluid* or therap* or intravenous* or iv)):ti,ab
#8	(#3 OR #4 OR #5 OR #6 OR #7)

### A.3.10 Training and education

**What are the barriers faced by healthcare professionals in the effective prescription and monitoring of intravenous fluids in hospital settings?**

Search constructed by combining the columns in the following table using the AND Boolean operator

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Fluid therapy	Training		Exclusions SRs RCTs Observational	No date restriction. Search run up to 12 March 2013.

### Training search terms

#### Medline search terms

1	clinical competence/
2	exp *education/
3	health knowledge, attitudes, practice/
4	physician's practice patterns/
5	ed.fs.
6	professional practice/
7	*medication errors/
8	*medical staff, hospital/
9	(train* or educat* or teach*).ti,ab.
10	(profession* adj2 develop*).ti,ab.
11	(barrier* or knowledge or attitude*).ti,ab.
12	(perception* or opinion* or ignoran* or unaware or responsibilit*).ti,ab.
13	((core or clinical) adj2 skill*).ti,ab.
14	(prescri* adj2 (protocol* or practice*)).ti,ab.
15	staff.ti,ab.
16	audit*.ti,ab.
17	or/1-16

#### Embase search terms

1	competence/ or clinical competence/ or professional competence/
2	exp *education/
3	*clinical practice/
4	exp *professional practice/
5	*medication error/
6	*medical staff/
7	(train* or educat* or teach*).ti,ab.
8	(profession* adj2 develop*).ti,ab.
9	(barrier* or knowledge or attitude*).ti,ab.
10	(perception* or opinion* or ignoran* or unaware or responsibilit*).ti,ab.
11	((core or clinical) adj2 skill*).ti,ab.
12	(prescri* adj2 (protocol* or practice*)).ti,ab.
13	staff.ti,ab.
14	audit*.ti,ab.
15	or/1-14

#### Cochrane search terms

#1	MeSH descriptor Clinical Competence, this term only
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#2	MeSH descriptor Education explode all trees
#3	MeSH descriptor Health Knowledge, Attitudes, Practice, this term only
#4	MeSH descriptor Physician's Practice Patterns, this term only
#5	Any MeSH descriptor with qualifier: ED
#6	MeSH descriptor Professional Practice, this term only
#7	MeSH descriptor Medication Errors, this term only
#8	MeSH descriptor Medical Staff, Hospital, this term only
#9	(train* or educat* or teach*):ti,ab
#10	(profession* NEAR/2 develop*):ti,ab
#11	(barrier* or knowledge or attitude*):ti,ab
#12	(perception* or opinion* or ignoran* or unaware or responsibilit*):ti,ab
#13	((core or clinical) NEAR/2 skill*):ti,ab
#14	(prescri* NEAR/2 (protocol* or practice*)):ti,ab
#15	staff:ti,ab
#16	audit*:ti,ab
#17	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16)

**CINAHL search terms**

S1	(MM "Education+") OR (MH "Professional Competence") OR (MH "Clinical Competence") OR (MM "Health Knowledge and Behavior (Iowa NOC) (Non-Cinahl)+") OR (MM "Practice Patterns") OR (MM "Professional Practice")
S2	MW ed
S3	(MH "Medication Errors") OR (MM "Medical Staff, Hospital")
S4	train* OR educat* OR teach*
S5	profession* n2 develop* OR barrier* OR knowledge OR attitude*
S6	perception* OR opinion* OR ignoran* OR unaware OR responsibilit*
S7	core n2 skill* OR clinical n2 skill* OR prescri* n2 protocol* OR prescri* n2 practice* OR TI staff OR AB staff OR audit
S8	S1 or S2 or S3 or S4 or S5 or S6 or S7

**PsychInfo search terms**

1	exp competence/
2	exp *education/
3	*health knowledge/
4	*clinical practice/
5	exp *medical personnel/
6	(train* or educat* or teach*).ti,ab.
7	(profession* adj2 develop*).ti,ab.
8	(barrier* or knowledge or attitude*).ti,ab.
9	(perception* or opinion* or ignoran* or unaware or responsibilit*).ti,ab.
10	((core or clinical) adj2 skill*).ti,ab.
11	(prescri* adj2 (protocol* or practice*)).ti,ab.
12	Staff.ti,ab.
13	Audit*.ti,ab.
14	or/1-13



## A.4 Economics search

### A.4.1 Economic searches

Economic searches were conducted in Medline, Embase, HEED and CRD for NHS EED and HTA.

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Fluid therapy			Economic	No date restriction. Search run up to 12 March 2013.

#### CRD search terms

#1	MeSH Fluid Therapy EXPLODE 1
#2	MeSH Isotonic Solutions
#3	MeSH Rehydration Solutions
#4	MeSH Water-Electrolyte Balance
#5	MeSH Water-Electrolyte Imbalance EXPLODE 1
#6	( water NEAR balance* ) OR ( water NEAR imbalance* ) OR ( electrolyte* NEAR balance* ) OR ( electrolyte* NEAR imbalance* ) OR osmoregulation*
#7	( fluid* NEAR replace* ) OR ( fluid* NEAR therap* ) OR ( fluid* NEAR substitut* ) OR ( fluid* NEAR restorat* ) OR ( fluid* NEAR resuscitat* )
#8	( fluid* NEAR perfusion ) OR ( fluid* NEAR volume ) OR ( fluid* NEAR balance* ) OR ( fluid* NEAR imbalance* )
#9	rehydrat*
#10	#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9

#### HEED search terms

1	AX=fluid* AND (replace* OR therap* OR substitut* OR restorat* OR resuscitat* OR perfusion OR volume OR prescri* OR load* OR overload* OR monit* OR assess* OR document* OR chart* OR challenge)
2	AX=(water or electrolyte* or fluid*) AND (balance* or imbalance*)
3	AX=osmoregulation* OR rehydrat* OR isotonic*
4	CS=1 OR 2 OR 3

Economic searches were conducted in Medline, Embase, HEED and CRD for NHS EED and HTA.

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Resuscitation			Economic	No date restriction. Search run up to 12 March 2013.

#### CRD search terms

#1	MeSH DESCRIPTOR shock EXPLODE ALL TREES WITH QUALIFIER undefined
#2	MeSH DESCRIPTOR Hypovolemia WITH QUALIFIER undefined
#3	MeSH DESCRIPTOR Hypotension WITH QUALIFIER undefined
#4	MeSH DESCRIPTOR Dehydration WITH QUALIFIER undefined
#5	MeSH DESCRIPTOR fluid therapy WITH QUALIFIER undefined
#6	(fluid* NEAR restor*) OR (fluid* NEAR resuscita*) OR (fluid* NEAR replac*):AU OR (fluid* NEAR deplet*) OR (fluid* NEAR deficien*)

#7	(volume* NEAR restor*) OR (volume* NEAR resuscita*) OR (volume* NEAR replac*):AU OR (volume* NEAR deplet*) OR (volume* NEAR deficien*)
#8	(fluid* NEAR challenge) OR (fluid* NEAR bolus) OR (hypotens* NEAR resuscit*):AU OR (hypovol?emi* or sepsis syndrome* or circulatory failure*)
#9	(shock or resuscit* or hypotens* or dehydrate*) AND (fluid*)
#10	(circulatory NEAR failure*) OR (circulatory NEAR insufficien*) OR (circulatory NEAR abnormalit*):AU OR (circulatory NEAR instability*)
#11	(h?emodynamic NEAR failure*) OR (h?emodynamic NEAR insufficien*) OR (h?emodynamic NEAR abnormalit*):AU OR (h?emodynamic NEAR instability*)
#12	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11

**HEED search terms**

1	AX=(fluid* OR volume*) AND (restor* OR resuscita* OR replac* OR deplet* OR deficien*)
2	AX=fluid* AND (challenge or bolus)
3	AX=hypotens* AND resuscit*
4	AX=fluid* AND (shock OR resuscit* OR hypotens* OR dehydrate*)
5	AX=hypovolemi* OR hypovolaemi* OR 'sepsis syndrome' OR 'circulatory failure'
6	AX=(circulatory OR hemodynamic OR haemodynamic) AND (failure* OR insufficien* OR abnormalit* OR instability*)
7	CS=1 OR 2 OR 3 OR 4 OR 5 OR 6

**A.4.2 Quality of life searches**

Quality of life searches were conducted in Medline and Embase.

Population	Intervention / exposure	Comparison	Study filter used	Date parameters
Fluid therapy			Quality of life	No date restriction. Search run up to 12 March 2013.