Bazian

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Individual-Level Behaviour Change

External evidence review 1: Appendices

Evidence review for Public Health Guidance

Developed by Bazian for NICE

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Appendices

A. Data extraction tables: relevant recommendations, evidence statements and studies and coding

Please note that studies cited in the evidence statements, and/or the "studies behind the statements" column, refer to references in the corresponding NICE evidence review that underpins each of the NICE public health guidance. The relevant evidence reviews, from which the evidence statements and studies have been drawn, are listed above each extraction table with hyperlinks to the relevant documents for reference.

Evidence statements associated with relevant recommendations were first reviewed to identify relevant BCT taxonomy vocabulary. Where sufficient detail was provided one or more BCTs were coded in the data extraction table. Where this detail was lacking, information about the intervention components was reviewed from the evidence tables and coded in the data extraction table. If no specific information was available to code a BCT then the next level up, the BCT cluster, was coded. If no BCT or cluster was identifiable the intervention function (IF) was inferred from any explicit statement of the intended function of the intervention, or inferred from a broader description of the intervention. Please see the Bazian Coding Manual Version 6 (Appendix B), for full details of the BCT taxonomy, BCT clusters and intervention functions used. The number of items in each of the coding frames is given below and indicates the level of specificity in each of the coding structures.

- BCT taxonomy code (89 items)
- BCT clusters (groups individual BCTs into 16 clusters)
- Intervention function (9 items)

A full description of the 89 BCTs, 16 clusters and 9 intervention functions can be found in Appendix B

PH1 Brief interventions and referral for smoking cessation (2006)

As described in the guidance. “Brief interventions involve opportunistic advice, discussion, negotiation or encouragement. They are commonly used in many areas of health promotion and are delivered by a range of primary and community care professionals.

For smoking cessation, brief interventions typically take between 5 and 10 minutes and may include one or more of the following:

- simple opportunistic advice to stop
- an assessment of the patient’s commitment to quit
- an offer of pharmacotherapy and/or behavioural support
- provision of self-help material and referral to more intensive support such as the NHS Stop Smoking Services.

The particular package that is provided will depend on a number of factors, including the individual’s willingness to quit, how acceptable they find the intervention on offer and the previous ways they have tried to quit.”

Evidence review: http://www.nice.org.uk/nicemedia/live/11375/43949/43949.pdf
Evidence table: http://www.nice.org.uk/nicemedia/live/11375/60739/60739.pdf

This public health guidance document and underlying evidence review contributed to evidence statements 1 and 4 in Review 1.

Relevant recommendations (R1-6)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R1: Everyone who smokes should be advised to quit, unless there are exceptional circumstances. People who are not ready to quit should be asked to consider the possibility and encouraged to seek help in the future. If an individual who smokes presents with a smoking-related disease, the cessation advice may be linked to their medical condition. **(IDE)**	Inference derived from the evidence	Inference derived from the evidence	No studies were quoted for this evidence statement and so no behaviour change techniques could be coded.
R2: People who smoke should be asked how interested they are in quitting. Advice to stop smoking should be sensitive to the individual's preferences, needs and circumstances: there is no evidence that the 'stages of change' model is more effective than any other approach. **(Evidence statement 10 and IDE)**	**Evidence statement 10** A moderately sized body of evidence [one 1+ systematic review] has not found a benefit of stage-matched over unmatched brief interventions. A moderately sized body of evidence has yielded conflicting results on the efficacy of stage-matched interventions compared with no intervention.	One systematic review evaluated the effectiveness of interventions to promote smoking cessation based on the Stages of Change (SOC) approach (Riemsma et al. 2003 1+). It contained 23 RCTs, 4 from the UK. These included a variety of types of intervention including stage based advice or counselling and stage based self-help materials.	Theory base: No evidence that “stages of change model” is more effective than any other approach. No behaviour change coding possible.
R3: GPs should take the opportunity to advise all patients who smoke to quit when they attend a consultation. Those who want to stop should be offered a referral to an intensive support service (for example, NHS Stop Smoking Services). If they are unwilling or unable to accept this referral they should be offered pharmacotherapy, in line with NICE technology appraisal guidance no. 39, and additional support. The smoking status of those who are not ready to stop should be recorded and reviewed with the individual once a year, where possible. **(Evidence statements 1 and 7)**	**Evidence statement 1** A body of level 1+ evidence directly applicable to UK health care settings supports the efficacy of physician advice as a brief intervention for smoking cessation but this evidence preceded the introduction of NHS specialist smoking treatment services in the UK.	Evidence for the efficacy of brief interventions from doctors was identified primarily from one systematic review (Lancaster and Stead 2004 1+) with additional supporting evidence from two further reviews of a similar body of research (Fiore et al. 2000 1++ West et al. 2000 1/4+). **NB: Lancaster and Stead 2004 is a Cochrane review, the updated version is assessed up to date as of 13th Feb 2008.** Advice was compared with no advice, more intensive intervention with less. Defined advice as verbal instructions from the physician with a 'stop smoking' message irrespective of whether or not information was provided about the harmful effects of smoking. Excluded advice + NRT or as part of mixed lifestyle interventions.	Intervention: Advice from a medical practitioner Intervention Function 1 Education

Relevant recommendations (R1-6)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	Evidence statement 7 A body of level 1+ evidence directly applicable to the UK supports the efficacy of nicotine replacement therapy (NRT) as part of a brief intervention for smokers wishing to make a quit attempt.	One review of nicotine replacement therapy for smoking cessation includes evidence on the effect of NRT delivered with minimal additional support from physicians or purchased over the counter (Silagy et al. 2004 [Cochrane]). This review identified 34 randomised trials of NRT prescribed with 'low intensity' support. **NB: Silagy et al. 2004 was a Cochrane review, an updated version is now available and is assessed as up to date as of 31 Oct 2007**	BCT4 Pharmacological support
R4: Nurses in primary and community care should advise everyone who smokes to stop and refer them to an intensive support service (for example, NHS Stop Smoking Services). If they are unwilling or unable to accept this referral they should be offered pharmacotherapy, in line with NICE technology appraisal guidance no. 39 and additional support. Nurses who are trained NHS stop smoking counsellors may 'refer' to themselves where appropriate. The smoking status of those who are not ready to stop should be recorded and reviewed with the individual once a year, where possible. **(Evidence statements 2 and 7)**	**Evidence statement 2** A body of level 1+ evidence directly applicable to the UK supports the efficacy of nurse structured advice as a brief intervention for smoking cessation in primary care and community settings. However, the primary focus of the contact in these studies was smoking, so these interventions are not brief opportunistic interventions made during routine care. In addition, poor uptake of invitations to contact nurses for assistance with smoking cessation was noted in some UK studies. There is insufficient evidence to say whether opportunistic advice increases quit rates. A moderately sized body of evidence failed to detect any effect of advice and interventions delivered by nurses as part of a health check.	Evidence for the efficacy of brief interventions from nurses was based on one systematic review (Rice and Stead 2004). Meta-analysis of 6 trials, two of which were in UK, all primary care or community setting. Five additional studies included but not in meta-analysis. Three studies in primary care or outpatient settings found no effect of physiological feedback in the form of spirometry or carbon monoxide levels as an adjunct to a nursing intervention ([within Rice and Stead 2004] Sanders et al. 1989*; Risser and Belcher 1990*; Hollis et al. 1993*).	**Intervention: Nurse** brief intervention, not opportunistic. Intervention Function 1 Education: advise patients who smoke to quit.
	Evidence statement 7 - see above	**Evidence statement 7 - see above**	**Evidence statement 7 - see above**
R5: All other health professionals, such as hospital clinicians, pharmacists and dentists, should refer people who smoke to an intensive support service (for example, NHS Stop Smoking Services). If the individual is unwilling or unable to accept this referral, practitioners with suitable training should offer a prescription of pharmacotherapy, in line with NICE technology appraisal guidance no. 39, and additional support. Those who are trained NHS stop smoking counsellors may 'refer' to themselves. The smoking status of those who are not ready to stop should be recorded in clinical records and reviewed with the individual once a year, where possible. **(Evidence statements 1, 2, 7 and 27 and IDE)**	**Evidence statement 27** There is insufficient evidence from direct comparisons to draw firm conclusions about the influence of the profession of a provider delivering a brief smoking cessation intervention, or the influence of features of the profession, on intervention effectiveness.	Three meta-analyses indirectly estimated the influence that the profession of a practitioner has on intervention effectiveness (Fiore et al. 2000, Gorin and Heck, 2004, West et al. 2000). One meta-analysis (Mojica et al. 2004) also attempted to answer the question directly and found just one study (McDowell et al. 1985*) which directly compared several provider types providing a smoking cessation intervention. One review (Gorin and Heck 2004) and three trials (Stevens et al. 1993* (included in Rigotti et al. 2003) and Stevens et al. 2000* (included in Rigotti et al. 2003), Katz et al. 2004a and b (reporting the same trial)) provided some information about possible characteristics of providers of brief interventions that may explain differential outcomes by provider type.	No behaviour change coding possible.
	Evidence statement 1, 2 and 7 see above	**Evidence statement 1, 2 and 7 see above**	**Evidence statement 1, 2 and 7 see above**
R6: Community workers should refer people who smoke to an intensive support service (for example, NHS Stop Smoking Services). Those who are trained NHS stop smoking counsellors may 'refer' to themselves. **(Evidence statement 27, IDE)**	**Evidence statement 27 see above**	**Evidence statement 27 see above**	**Evidence statement 27 see above**

PH2 Four commonly used methods to increase physical activity (2006)

The four interventions covered in the guidance are listed below along with hyperlinks to their respective evidence reviews.

- Brief interventions (BI)
- Exercise referral schemes (ER)
- Using pedometers (P)
- Walking and cycling schemes (WC)

The letter(s) in brackets correspond to the letters preceding each evidence statement in the table below to identify which evidence review is relevant to each evidence statement. Effectiveness was examined over three timescales: in the short term (6–12 weeks); in the longer term (over 12 weeks) and over a very long timeframe (for example, over 1 year).

This public health guidance document and underlying evidence review contributed to evidence statements 10 and 12 in Review 1.

Relevant recommendations (1,2,5,6)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R1: Primary care practitioners should take the opportunity, whenever possible, to identify inactive adults and advise them to aim for 30 minutes of moderate activity on 5 days of the week (or more)[14]. They should use their judgement to determine when this would be inappropriate (for example, because of medical conditions or personal circumstances). They should use a validated tool, such as the Department of Health's forthcoming general practitioner physical activity questionnaire (GPPAQ), to identify inactive individuals. **(Evidence statements BI.1, BI.2c, IDE)** *[14]The practitioner may be a GP or another professional with specific responsibility for providing encouragement or advice. This will depend on local conditions, professional interest and resources. Health trainers are likely to have a role in offering brief advice. 'Inactive' is used as shorthand for those failing to reach the CMO's recommendation. 'Advise' is used as shorthand for 'encourage, advise, discuss, negotiate'*	Inference derived from the evidence	Not applicable	No behaviour change coding possible.
	Evidence statement BI.1. There is evidence from controlled trials that brief interventions in primary care can be effective in producing moderate increases in physical activity in middle aged and older populations in the short term (two (1+) studies and one (1-) study); in the longer term (one (1++) study, one (2-) study and one (1-) study); and in the very long term (two (1++) studies and one (1-) study. The findings are potentially applicable to the UK, assuming appropriate adaptation. However, for the effect to be sustained at one year, the evidence suggests that several follow-up sessions over a period 3 to 6 months are required after the initial consultation episode.	Evidence from eleven primary studies (6 individual RCTs, 2 cluster RCTs, and 3 controlled non-randomised trials) suggests that brief interventions in primary care to increase physical activity can have short, longer term or very long term effects. Six studies reported significant increases in physical activity outcomes: two (1++) studies (Elley et al., 2003; Petrella et al., 2003); two (1+) studies (Harland et al., 1999; Swinburn et al., 1998); one (1-) study (Halbert et al., 2000) and one (2-) study (Bull and Jamrozik, 1998). Five reported no significant effect: one (1+) (Hillsdon et al., 2002) one (2+) (Smith et al., 2000); and two (2-) studies (Halbert et al., 2001; Naylor et al., 1999) and one (1-) study (Goldstein et al., 1999)	Intervention: brief intervention Elley 2003 – brief oral and written advice (based on motivational interviewing) (Intervention Function 1 Education, Intervention Function 2 Persuasion) + three calls from exercise specialist (BCT3 Social support (unspecified)) Petrella 2003 – No behaviour change coding possible. Harland 1999 – brief advice plus motivational interviews (Intervention Function 1 Education, Intervention Function 2 Persuasion) Swinburn 1998 – brief verbal advice +written prescription (Intervention Function 1 Education) Halbert 2000 – advice pamphlet and physical activity plan for next 3 months (BCT64 Action Planning, BCT34 Adding objects to the environment) Bull and Jamrozik, 1998 – brief verbal advice (Intervention Function 1 Education).
	Evidence statement BI.2.c. Interventions aimed at older groups seem more effective. However, these were also the studies in which the interventions involved follow-up and it is therefore difficult to arrive at firm conclusions about whether this effect was linked to the age of the population or the design of the intervention.	Two studies focussed on older populations (Halbert et al. 2000;Petrella et al. 2003), three focussed on middle aged populations (Bull and Jamrozik 1998;Harland et al. 1999;Swinburn et al. 1998) and one involved both middle aged and older populations (Elley et al. 2003). The three studies with long term impacts tended to involve older populations (Elley et al. 2003; Halbert et al. 2000; Petrella et al. 2003).	Subgroup older groups. See coding above.

Relevant recommendations (1,2,5,6)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R2: When providing physical activity advice, primary care practitioners should take into account the individual's needs, preferences and circumstances. They should agree goals with them. They should also provide written information about the benefits of activity and the local opportunities to be active. They should follow them up at appropriate intervals over a 3 to 6 month period. **(Evidence statements BI.2a, BI.2b)**	**Evidence statement BI.2.a.** A 'written prescription' outlining physical activity goals and/or step testing during the consultation may be useful adjuncts to verbal advice to increase physical activity. However, it is difficult to separate the relative contribution of these elements of the intervention from the impact of follow-up sessions after the initial consultation and studies that did not find significant effects also involved a 'written prescription'.	The six studies shown to have an effect (see above) varied according to what happened at the initial consultation and whether there was follow-up to reinforce advice to increase physical activity. Four studies involved a 'written prescription' in which the healthcare professional provided written goals during the consultation to increase physical activity (Elley et al. 2003 [++]; Halbert et al. 2000 [-]; Petrella et al. 2003 [++];Swinburn et al. 1998 [+]).	Intervention: Brief intervention with "written prescription" BCT62 Goal setting (behaviour) NB: Not enough detail to code BCT 67 Behavioural Contract as don't know if written prescription was agreed with the person receiving it, or was just given to them like a form of advice.
	Evidence statement BI.2.b. Follow-up over an appropriate time period appears to be more important than the length of individual sessions.	There were no clear correlations between effectiveness of intervention and length of the initial consultation. However, it is again notable that the three interventions with impacts over the very long term were those in which there was follow-up for several months after the initial intervention(Elley et al. 2003 [++]; Halbert et al. 2000 [-]; Petrella et al. 2003 [++])	No behaviour change coding possible for the effect of follow up vs. length of individual sessions.
R5: Practitioners, policy makers and commissioners should only endorse exercise referral schemes to promote physical activity that are part of a properly designed and controlled research study to determine effectiveness. Measures should include intermediate outcomes such as knowledge, attitudes and skills, as well as measures of physical activity levels. Individuals should only be referred to schemes that are part of such a study. **(Evidence statements ER.1, ER.2)**	**Evidence statement ER.1.** The evidence from two randomised controlled trials [1-] suggests that exercise referral schemes, involving a referral, either from or within primary care, can have positive effects on physical activity levels in the short term (6 to 12 weeks).	Two studies (both [1-]) examined the short-term effects of an exercise referral scheme and both found a short-term positive effect on physical activity levels (Taylor et al. 1998; Halbert et al. 2000). Self-reported moderate physical activity levels increased by 102 minutes per week in comparison to the control group in one study (Taylor et al. 1998) and by 1 walking session per week and 2 vigorous exercise sessions per week in the other study (Halbert et al. 2000).	Intervention: exercise referral schemes Lamb 2002 [++] and Taylor 1998 [-] Intervention Function 1 Education: participants advised to do recommended amount of physical activity per week. Halbert 2000 [-] 3month physical activity plan pamphlet (BCT64 Action planning) with self-monitoring of heart rate (BCT11 Self-monitoring of outcomes). Also "individualised physical activity advice" (Intervention Function 1 Education)
	Evidence statement ER.2. However evidence from four trials (one 1++, three 1-) indicates that such referral schemes are ineffective in increasing physical activity levels in the longer term (over 12 weeks) or over a very long timeframe (over 1 year).	Overall, evidence from the four RCT's demonstrates that exercise referral schemes are ineffective in increasing physical activity levels in the longer term. The [1++] study by Lamb et al. (2002) found that the intervention had no effect on physical activity levels in the longer term. The remaining three [1-] studies showed equivocal results in the longer term: a positive effect (Halbert et al. 2000), no effect (Taylor et al. 1998) and inconsistent findings (Harrison et al. 2005).	

Relevant recommendations (1,2,5,6)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R6: Practitioners, policy makers and commissioners should only endorse pedometers and walking and cycling schemes to promote physical activity that are part of a properly designed and controlled research study to determine effectiveness. Measures should include intermediate outcomes such as knowledge, attitude and skills, as well as measures of physical activity levels. **(Evidence statement P.1, WC.1, WC.2)**	**Evidence statement P.1.** The evidence from four (1-) randomised controlled trials involving different target groups for the effectiveness of pedometer-based interventions aimed at increasing physical activity levels in the adult population is equivocal in both the short-term (6-12 weeks) and longer term (12 weeks to one year). No evidence was found which examined effectiveness over one year (the longest follow up in the included studies was at 24 weeks).	Three of the studies were conducted in a community based setting (DuVall et al. 2004, Moreau et al. 2001, Tudor-Locke et al. 2004) and one in a combination of a community and home-based setting (Talbot et al. 2003). All these RCTs examined the effectiveness of pedometers to increase physical activity levels in adults. Two studies reported assessments in the short term (6-12 weeks) (DuVall et al. 2004, Talbot et al. 2003) and three studies reported assessments in the long termer (over 12 weeks) (Talbot et al. 2003, Moreau et al. 2001, Tudor-Locke et al. 2004).	Intervention: pedometers DuVall et al. 2004 BCT10 Self-monitoring of behaviour, BCT62 Goal setting (behaviour), BCT65 Review behaviour goal(s) Moreau et al. 2001 = BCT10 Self-monitoring of behaviour, BCT62 Goal setting (behaviour) Tudor-Locke et al. 2004 = BCT8 Feedback on behaviour, BCT62 Goal setting (behaviour). Talbot et al. 2003 = BCT8 Feedback on behaviour BCT10 Self-monitoring of behaviour
	Walking programmes **Evidence statement WC.1** The evidence from four primary studies (two individual RCTs (one 1++, one 1-), 1 cluster RCT (1++), one delayed intervention study (2-)) for the effectiveness of community-based walking programmes in increasing physical activity is equivocal. The findings are applicable to similar interventions in the UK.	The two (1++) studies of broadly similar interventions had conflicting results: one individual RCT (Lamb et al. 2002) found no increase in physical activity in the intervention group compared to the control (at six and 12 months), while the cluster RCT (Fisher and Li, 2004) found an increase in neighbourhood walking in the intervention group with an effect size of 0.2 at six months The two studies graded (-) quality also had conflicting results. One RCT (1-) (Hamdorf and Penhall, 1999) found an increase in physical activity and positive changes in resting and exercise heart rate at 6 months. The delayed intervention controlled study (2-) (Macrae et al. 1996) found no change in energy expenditure among the intervention group compared to the control at 12 weeks.	Intervention: walking schemes Lamb 2002 Intervention Function 1 Education - advice session, verbal and written advice Fisher and Li, 2004 (community level) Hamdorf and Penhall, 1999 (community level) Macrae et al. 1996 Accompanied walk program BCT Cluster 1 “Social Support”
	Evidence statement WC.2. There is no evidence about the effectiveness of community-based cycling programmes using a controlled research design. Evaluation reports from the grey literature show that these programmes are popular and well-received by participants, but there is little evidence of their impact on levels of cycling.	No evidence	Intervention: cycling schemes No behaviour change coding possible.

PH3 Prevention of sexually transmitted infections and under 18 conceptions (2007)

Evidence reviews:

- Evidence Briefing Update: HIV prevention: a review of reviews assessing the effectiveness of interventions to reduce the risk of sexual transmission (2006)
- Evidence Briefing Update: Prevention of sexually transmitted infections (STIs): a review of reviews into the effectiveness of non-clinical interventions (2006)
- Review 1 - Contraceptive advice and provision for the prevention of under 18 conceptions and STIs: a rapid review
- Review 2 - Review of evidence for the effectiveness of screening for genital chlamydial infection in sexually active young women and men
- Review 3 - Review of evidence for the effectiveness of partner notification for sexually transmitted infections including HIV

This public health guidance document and underlying evidence review contributed to evidence statements 19 and 20 in Review 1.

Relevant recommendations (1-3, 5,6)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R1: Identify individuals at high risk of STIs using their sexual history. Opportunities for risk assessment may arise during consultations on contraception, pregnancy or abortion, and when carrying out a cervical smear test, offering an STI test or providing travel immunisation. Risk assessment could also be carried out during routine care or when a new patient registers. Have one to one structured discussions with individuals at high risk of STIs (if trained in sexual health), or arrange for these discussions to take place with a trained practitioner. **(Evidence statement 1.1, 1.2, 1.3, 1.4, 2.20, 2.21, 2.26, 2.29, IDE)**	See Recommendation 2 (R2).	See R2	Intervention: one to one structured discussions (identifying high risk individuals is not an individual behaviour change intervention)
	Evidence statement 2.20. There is evidence from two (+) controlled trials (one randomised,[17] one non-randomised[18]) that offering chlamydia testing in general practice increases the number of young women and men screened compared with usual care. This evidence applies to women and men under 30 years attending general practices.	17 Senok et al. 2005 [+] 18 Andersen et al. 2005 [+]	Not applicable – uptake of screening, no behaviour change outcome such as use of condoms.
	Evidence statement 2.21. There is evidence from two (+) randomised controlled trials (one large,[19] one small[20]) suggesting that changing systems of health service delivery can increase the numbers of teenage women screened opportunistically, and the number of chlamydia cases detected. This evidence applies to sexually active young women under 20 years attending general paediatric or teen clinics.	19 Shafer et al. 2002 [+} 20 Stevens-Simon et al. 2002 [+]	Not applicable – health service delivery level, not individual.
	Evidence statement 2.26. Descriptive studies in general practice (two studies, one ++,[24] one +[25]) suggest that offering GPs incentives might increase acceptance rates by patients. There were too few studies to be able to say anything about the effects of incentives on effective screening rates.	24 Pimenta et al. 2003b [++] 25 van den Hoek et al. 1999 [+]	Not applicable – GP intervention, rather than directed at the individual at risk.
	Evidence statement 2.29. Data from one (+) randomised controlled trial,[26] one (++) descriptive study,[27] and three (+) descriptive studies[31] (one + contradictory study[32]) show that less than half of women and men under 25 years attending general practice get screened for chlamydia because not all those who are eligible for screening are offered a test.	26 Senok et al. 2005 [+] 27, Pimenta et al. 2003b [++] 31 Andersen et al. 2005 [+], Santer et al. 2000 [+] Tobin et al. 2001 [+] 32 Heal et al. 2002 [+]	Not applicable – about frequency of offering screening test. No behaviour change outcomes.
R2: Have one to one structured discussions with individuals at high risk of STIs. The discussions should be structured on the basis of behaviour change theories. They should address factors that can help reduce risk-taking and improve self-efficacy and motivation. Ideally, each session should last at least 15–20 minutes. The number of sessions will depend on individual need. **(Evidence statement 1.1, 1.2, 1.3, 1.4, IDE)**	**Evidence statement 1.1 (STIs including HIV)** In summary the evidence on the effectiveness of one to one interventions for the prevention of STIs is mixed but on balance marginally supports the interventions. There is evidence from Project RESPECT a large (++) US study (Kamb et al., 1998) that both a two session and a four session one to one counselling intervention can reduce STIs in the long and very long term in heterosexuals, and from one (+) study that STIs in men can be reduced in the long term after one 90 minute session (Kalichman et al., 1996). However, the effect appears to decrease over time, with one study finding a reduction in effect after six months (Kamb et al., 1998).	Kamb et al. 1998 (RESPECT) Kalichman et al. 1996	Intervention: one to one structured discussions (interactive counselling) Kamb et al. 1998: BCT61 Problem solving BCT62 Goal setting (behaviour) BCT64 Action planning Kalichman et al. 1996:

Relevant recommendations (1-3, 5,6)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
			BCT23 Behavioural practice/rehearsal BCT36 Instructions on how to perform a behaviour BCT78 Information about health consequences
	Evidence Statement 1.2 In addition EXPLORE a large (++) US study of ten session one to one counselling for MSM found a 15.7% reduction in HIV infection but this was not statistically significant (EXPLORE 2004). The other studies found no statistically significant effect on STIs but may have been underpowered for this outcome.	EXPLORE 2004	Subgroup: MSM
	Evidence Statement 1.3 Interventions with adolescents (people aged 12-18) appeared to be particularly effective. A subgroup analysis of Project RESPECT (Bolu 2004) found a significant reduction in sexually transmitted infections with both the four and two session interventions versus a didactic control. Although this was the only study to show a statistically significant difference the general trend in this group of studies was towards a reduction in STIs.	12 studies listed in Table 7 PH3 EvR1 http://www.nice.org.uk/nicemedia/live/11377/43875/43875.pdf Bolu 2004 [++] (subgroup of Kamb 1998 Project RESPECT above)	Subgroup: Adolescents particularly effective Kamb et al. 1998: BCT61 Problem solving BCT62 Goal setting (behaviour) BCT64 Action planning
	Evidence Statement 1.4 Twenty-five studies reported condom use, of which only eight showed a statistically significant increase in condom use in the intervention group compared to the control. However, overall there is weak evidence (that is it is mixed or conflicting but on balance marginally supports) that one to one STI/HIV prevention interventions can increase short and long-term condom use compared to control. Project RESPECT, a large good quality (++) US study found an increase in condom use in both the four and two session counselling intervention groups compared to a didactic control (Kamb 1998). However, several studies found the effect of an intervention appears to decrease, or disappear over time. Greater uniformity is needed in the way in which condom use is measured in studies. Twenty-five studies measured condom use; eight with adolescents, nine with the general population, two with MSM, one with prisoners, and three with drug users. The studies covered short, long and very long term condom use. Eleven studies reported consistent condom use as dichotomous data (e.g. always used a condom/ consistent condom use, 100% condom use) and this is summarised in forest plots in figures 4 and 5	Kamb 1998 25 studies listed in Table 8 PH3 EvR1 and figures 4 and 5. http://www.nice.org.uk/nicemedia/live/11377/43875/43875.pdf	Kamb et al. 1998: BCT61 Problem solving BCT62 Goal setting (behaviour) BCT64 Action planning
R3: Help patients with an STI to get their partners tested and treated (partner notification), when necessary. This support should be tailored to meet the patient's individual needs. If necessary, refer patients to a specialist with responsibility for partner notification. (Partner notification may be undertaken by the health professional or by the patient.)	**Evidence statement 3.1** There is evidence from four large randomised controlled trials[10] (two +; two –) that patient-delivered partner therapy plus additional information for partners reduces persistent or recurrent infections in women and men diagnosed with gonorrhoea or C. trachomatis by approximately 5% compared to patient referral (either minimal or supplemented by contact card).	Golden et al. 2005 (+) (Packets to be delivered to partners by index patient (content: antibiotics; drug information; condoms; study personal contact info; brochure about STDs; info that care for STDs is free) Kissinger et al. 2005 (–); (packages similar to above plus number of a nurse for questions) Kissinger et al. 1998 (-); (Antibiotics) Schillinger et al. 2003 (+) (index patients give out advise and give treatment packages)	Intervention: partner therapy plus additional information Intervention Function 1 Education– index patients giving advice to partners BCT3 Social support (unspecified) – nurse social support BCT4 Pharmacological support - antibiotics
Provide the patient and their partners with infection-specific information, including advice about possible re-infection. For chlamydia infection, also consider providing a home sampling kit.	**Evidence statement 3.2** There is evidence from one large randomised controlled trial[12] (-) that patient referral supplemented by additional information about infection for index patients and partner(s) reduces persistent or recurrent infections in men	12 Kissinger et al. 2005 (-)	Intervention: patient referral supplemented by additional information Intervention Function 1 Education: Advice from index partner to go to health care

Relevant recommendations (1-3, 5,6)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
(Evidence statement 3.1, 3.2, 3.8, 3.16, IDE)			facility BCT78 Information about health consequences
	Evidence statement 3.8 There is weak evidence from two randomised controlled trials[20] (both –) that giving index patients diagnosed with C. trachomatis sampling kits for their partner(s) can increase the number of partners who get tested when compared to getting the partner(s) to visit their doctor for testing.	20 Andersen et al. 1998, Ostergaard et al. 2003	BCT34 Adding objects to the environment
	Evidence statement 3.16 There is evidence from one randomised controlled trial[25] (++) that patient referral for patients with chlamydia conducted in general practice is at least as effective in terms of partners who get treated when compared to referring patients to a specialist health service.	23 Low et al. 2005	No behaviour change coding possible. For intervention mode of delivery.
R5: Where appropriate, provide one to one sexual health advice on: • how to prevent and/or get tested for STIs and how to prevent unwanted pregnancies • all methods of reversible contraception, including long-acting reversible contraception (LARC) (in line with NICE clinical guideline 30) • how to get and use emergency contraception • other reproductive issues and concerns. Provide supporting information on the above in an appropriate format. (Evidence statement 1.3, 1.4, 1.18, 1.19, IDE)	**Evidence statement 1.3** see above	**Evidence statement 1.3** see above	See above
	Evidence statement 1.4 see above	**Evidence statement 1.4** see above	See above
	Evidence Statement 1.18 (Clinic based contraception care) One (-)RCT and one (2+) non randomised controlled study evaluated contraception advice and support in a clinic based setting (Shlay 2003 (-), Winter 1991 (2+)). One (Winter 1991) found a significant reduction in pregnancies and the other (Shlay 2003) showed a trend towards a reduction in the intervention group compared to control but this was not significant. In summary although only four studies showed a statistically significant reduction in pregnancy (O'Sullivan 1992(-), Olds 2002(+), Olds 2004(+), Winter 1991(2+)) the general trend was towards a reduction. Therefore, there appears to be evidence that one to one interventions with adolescents can reduce pregnancies. Multi-session nurse home visiting appears particularly effective, especially with low-income disadvantaged women (Olds 1997, Olds 2002, Olds 2004). However, more research, is needed in this area with a focus on the under 18s and studies powered to detect a change in pregnancies.	Evidence review for evidence tables: http://www.nice.org.uk/nicemedia/live/11377/43875/43875.pdf Shlay 2003 Winter 1991	Intervention: clinic based one to one sexual health advice Intervention Function 1 Education - provide advice BCT34 Adding objects to the environment – contraception - condoms and contraceptive drugs BCT4 Pharmacological support - contraceptive drugs
	Evidence Statement 1.19 (Contraceptive use) Seven studies reported contraception use. This was measured in various different ways, including oral contraception, emergency contraception and condom use. Four studies showed a statistically significant effect on contraception use. Two increased oral contraceptive use. These were a (++) RCT (Quinlivan 2003) and a (+) RCT (Danielson 1990) that found one to one interventions with teenagers can improve contraception use in the long term. Of the two (++) studies of advanced provision of emergency contraception one found an increase in the use of EC (Harper 2005) and one an increase in condom use (Gold 2004). In the other studies the general trend was towards an increase in contraception use although one (-) study found the effect on contraception use was no longer significant at 12 months (Winter 1991). Therefore, there is some evidence that one to one interventions with under 18s can increase contraception use. However, further research in this area is needed.	Quinlivan 2003 Danielson 1990 Harper 2005 Gold 2004 Winter 1991	IF1 Education on its own or in combination with BCT 34 Adding objects to the environment (contraception) Quinlivan 2003 (Intervention Function 1 Education) Danielson 1990 (Intervention Function 1 Education) Harper 2005 (BCT34 Adding objects to the environment) Gold 2004 (Intervention Function 1 Education ± BCT34 Adding objects to the environment) Winter 1991 (Intervention Function 1 Education ± BCT34 Adding objects to the environment)
R6: Regularly visit vulnerable women aged under 18 who are pregnant or who are already mothers.	**Evidence Statement 1.17 (Support for pregnancy women/mothers)** Six studies evaluated interventions to support pregnant women or mothers. Although only two of the studies	Evidence review 1: http://www.nice.org.uk/nicemedia/live/11377/4	Intervention: visit, discuss and provide information.

Relevant recommendations (1-3, 5,6)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
Discuss with them and their partner (where appropriate) how to prevent or get tested for STIs and how to prevent unwanted pregnancies. The discussion should cover: • all methods of reversible contraception, including LARC (in line with NICE clinical guideline 30), and how to get and use emergency contraception • health promotion advice, in line with NICE guidance on postnatal care (NICE clinical guideline 37) • opportunities for returning to education, training and employment in the future. Provide supporting information in an appropriate format. Where appropriate, refer the young woman to the relevant agencies, including services concerned with reintegration into education and work. **(Evidence statement 1.17, IDE)**	focused solely on adolescents (O'Sullivan 1992 (-), Quinlivan 2003 (++)) all included at least 40% of adolescents and focused on disadvantaged, low-income women. There is good evidence that multi-session support and home visiting for disadvantaged low-income pregnant women or mothers can prevent repeat pregnancies with two (+) (Olds 2002, Olds 2004) and one (-) (O'Sullivan 1992) studies showing a significant reduction in repeat pregnancies in the intervention group compared to control. In addition one (-) study (Olds 1997) found a reduction in repeat pregnancies in poor unmarried women, although not in the sample as a whole.	3875/43875.pdf O'Sullivan 1992 Quinlivan 2003 Olds 1997 Olds 2002 Olds 2004	O'Sullivan 1992 (Intervention Function 1 Education, BCT84 Demonstration of the behaviour) Quinlivan 2003 (Intervention Function 1 Education) Olds 1997 (BCT36 Instructions on how to perform a behaviour, Intervention Function 1 Education, BCT3 Social support (unspecified)) Olds 2002 (BCT36 Instructions on how to perform a behaviour, Intervention Function 1 Education) Olds 2004 (as olds 2002)

PH4 Interventions to reduce substance misuse among vulnerable young people (2007)

For the purposes of this guidance, substance misuse is defined as intoxication by – or regular excessive consumption of and/or dependence on – psychoactive substances, leading to social, psychological, physical or legal problems. It includes problematic use of both legal and illegal drugs (including alcohol when used in combination with other substances).

Vulnerable and disadvantaged children and young people aged under 25 who are at risk of misusing substances include:

- those whose family members misuse substances
- those with behavioural, mental health or social problems
- those excluded from school and truants
- young offenders
- looked after children
- those who are homeless
- those involved in commercial sex work
- those from some black and minority ethnic groups.

Effectiveness review: http://www.nice.org.uk/nicemedia/live/11378/31916/31916.pdf
Effectiveness review evidence tables: http://www.nice.org.uk/nicemedia/live/11378/31917/31917.doc

This public health guidance document and underlying evidence review contributed to evidence statement 18 in Review 1.

Relevant recommendations (2,5)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)

R2:
• Use existing screening and assessment tools to identify vulnerable and disadvantaged children and young people aged under 25 who are misusing – or who are at risk of misusing – substances. These tools include the Common Assessment Framework and those available from the National Treatment Agency.
• Work with parents or carers, education welfare services, children's trusts, child and adolescent mental health services, school drug advisers or other specialists to:
  ○ provide support (schools may provide direct support)
  ○ refer the children and young people, as appropriate, to other services (such as social care, housing or employment), based on a mutually agreed plan. The plan should take account of the child or young person's needs and include review arrangements.
IDE
	Not applicable - Inference derived from the evidence	Not applicable - Inference derived from the evidence	Intervention: provide support to young person
			No evidence from which to code behaviour change.

Relevant recommendations (2,5)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R5: • Offer one or more motivational interviews, according to the young person's needs. Each session should last about an hour and the interviewer should encourage them to: o discuss their use of both legal and illegal substances o reflect on any physical, psychological, social, education and legal issues related to their substance misuse o set goals to reduce or stop misusing substances. **Evidence statements 52.1, 52.2, 53.1, 53.2**	**Evidence statement 52.1** There is evidence from one systematic review +, two RCTs (1 + and 1 -) and one Controlled Non-Randomised Trial – to suggest that motivational interviewing and brief intervention can have short term effects on the use of cigarettes, alcohol and cannabis (Tait and Hulse, 2003; McCambridge and Strang 2004; Oliansky et al., 1997; Aubrey, 1998). Applicability Rating A.	Tait and Hulse, 2003 (Brief interventions unspecified content – no code) McCambridge and Strang 2004 (motivational interview) Oliansky et al., 1997 (Brief education intervention:, Motivational Interview, contract of personal goals) Aubrey, 1998 (motivational interview, feedback, interview covered negative consequences of use, advice to reduce consumption)	**Intervention:** Motivational interviewing and brief intervention Intervention Function 1 Education - advice to reduced substance misuse Intervention Function 2 Persuasion - Motivational interviews BCT3 Social support (unspecified) –counselling micro skills were used BCT63 Goal setting (outcome) BCT Cluster 14 "Natural Consequences"– interview covered negative consequences of substance misuse
	Evidence statement 52.2 There is evidence from one RCT + however, to suggest that motivational interviewing does not have a significant medium term impact on the use of cigarettes, alcohol or cannabis, although there is a non-significant trend favouring intervention compared with control (McCambridge and Strang, 2005). Applicability Rating A.	McCambridge and Strang 2004 (motivational interview)	Intervention Function 2 Persuasion BCT3 Social support (unspecified)
	Evidence statement 53.1 There is evidence from one RCT + to suggest that a single session of motivational interviewing can have a positive impact on attitudes, intentions and behavioural outcomes related to substance use in the short term (McCambridge and Strang, 2004). However, there is evidence from one RCT + to suggest that these positive effects do not last in the medium term (McCambridge and Strang, 2005). Applicability Rating A.	McCambridge and Strang 2004/2005 (motivational interview)	Intervention Function 2 Persuasion BCT3 Social support (unspecified)
	Evidence statement 53.2 There is evidence from one RCT + to suggest that brief intervention enhanced with additional support can have a positive impact on attendance at community treatment agencies and psychological wellbeing compared to usual hospital treatment (Tait et al., 2004). Applicability Rating B.	Tait et al., 2004	BCT Cluster 14 "Natural Consequences"– interview covered negative consequences of substance misuse (we do not know if these were health, emotional or social consequences) BCT32 Avoidance/reducing exposure to cues for the behaviour BCT3 Social support (unspecified)

PH5 Workplace interventions to promote smoking cessation (2007)

The majority of recommendations in this guidance related to community level interventions and activities and so were not included. Only one individual level recommendation was identified as relevant and referred to a list of effective smoking cessation interventions. Both the recommendation and the list of effective interventions are included in the table below.

Evidence review: http://www.nice.org.uk/nicemedia/live/11381/43914/43914.pdf (Evidence table p42-67)

This public health guidance document and underlying evidence review contributed to evidence statements 2, 3, 4, 5 and 6 in Review 1.

Relevant recommendation (4)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R4: to all those offering smoking cessation services including the NHS, independent or commercial organisation and employers. • Offer one or more interventions that have been proven to be effective (see below). • Ensure smoking cessation support and treatment is delivered only by staff who have received training that complies with the 'Standard for training in smoking cessation treatments' (www.nice.org.uk/page.aspx?o=502591). • Ensure smoking cessation support and treatment is tailored to the employee's needs and preferences, taking into account their circumstances and offering locations and schedules to suit them. **(Evidence statements 1, 2, 5, 6, 7, 8, 11, 13)** **Individual intervention element:** "Offer one or more interventions that have been proven to be effective". Which they specify are: • Brief interventions • Individual behavioural counselling • Group Behaviour therapy • Pharmacotherapies • Self-help materials • Telephone counselling and quitlines **(see below for evidence behind each of these interventions)**	**Evidence statement 1** Although there are no available studies exploring which workplace interventions are most effective in the context of smoke-free legislation, one 2+ study of a variety workplace intervention types offered in the context of a localised smoking ban found that more intensive interventions (e.g. group treatment and one-hour clinics) produce higher success rates than less intensive interventions (e.g. brief individual counselling and self-help manuals). It is unclear how readily these findings translate to workplaces in jurisdictions where comprehensive smoke-free legislation has been introduced.	Waranch et al. 1993 2+ **NB** updated Cochrane review on Workplace interventions for smoking cessation 2008 has addressed this lack of evidence since this guidance was published.	No behaviour change coding possible.
	Evidence statement 2 A 1++ systematic review and a 1+ meta-analysis of the available international literature indicates that the most effective smoking cessation interventions in workplace settings are those interventions that have proven effectiveness more broadly. There is strong evidence that group therapy, individual counselling and pharmacological treatments all have an effect in facilitating smoking cessation. However, both reviews failed to identify effects due to particular intervention type. There is also evidence that minimal interventions including brief advice from a health professional are effective. Self-help manuals appear to be less effective, although there is limited evidence that interventions tailored to the individual have some effect.	1++ systematic review (Moher et al. 2005 [Cochrane]) **NB: This has been updated see Cochrane review on Workplace interventions for smoking cessation 2008** 1+ meta-analysis (Fisher et al. 1990 1+) "Incentives do not increase cessations rates but do increase participation."	Interventions: • Brief interventions (Intervention Function 1 Education and often BCT4 Pharmacological support) • Individual behavioural counselling (BCT3 Social support (unspecified)) • Group Behaviour therapy (BCT3 Social support (unspecified)) • Pharmacotherapies (BCT4 Pharmacological support) • Self-help materials (Intervention Function 1 Education)
	Evidence statement 5 A 1+ study and a 2++ study found that men and women were equally successful in achieving abstinence in workplace smoking cessation programmes; however, important gender differences were apparent in smoking attitudes and behaviours. Women had less confidence in their ability to quit and required extra stimuli in order to quit smoking. Although these findings are based on American studies, they are likely to be broadly applicable to a UK setting	Campbell et al. 2000/2002 1+; Stockton et al. 2000 2++; Gritz et al. 1998 1+	Subgroup: Gender
	Evidence statement 6 Although no studies were identified in the literature search that specifically	Olsen et al. 1991 2++; Albertson et al. 2004 2+; Chan and Heaney 1997 2+	Subgroup: Age

Relevant recommendation (4)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	address effective workplace interventions for younger and older smokers, evidence from a 2++ study indicates that older smokers are more likely to achieve successful abstinence in workplace interventions than younger smokers (although these employees were also more likely to be managers and light smokers). Furthermore, two 2+ studies examined the impact of age and job stress on cessation. Results from one study revealed that younger employees benefited more from higher demands than older employees with regards to smoking cessation. However, these findings were not supported in the other 2+ study. Therefore, although further research is needed in this area it may be possible that younger employees who smoke require more intensive support for smoking cessation than older smokers and that specifically tailoring interventions based on age may be beneficial. Although these findings are based on American studies, they are likely to be broadly applicable to a UK setting.		
	Evidence statement 7 A 2+ study found that although there were ethnic differences in baseline smoking patterns and attitudes towards cessation, ethnicity was not a significant predictor of successful abstinence. Another 1+ study found that a tailored intervention which incorporated linguistically and culturally appropriate materials, was effective in promoting behaviour change in a working class multi-ethnic population. Although these studies are from the USA, which has a different ethnic composition to the UK, it is likely that their findings are broadly applicable to a UK setting.	Daza et al. 2006 2+; Hunt et al. 2003/Emmons et al. 2005 1+	Subgroup: Ethnicity
	Evidence statement 8 No studies were identified in the literature search that specifically addressed effective workplace interventions for temporary or casual workers. As delivering workplace interventions to this population pose a significant challenge, research is urgently needed in this area.	No evidence.	No evidence.
	Evidence statement 11 According to a 1++ systematic review, a key way that employers can encourage smokers to quit is by offering smoking cessation support. Such support is particularly important in the context of workplace smoking bans. A 2+ study concludes that because different types of smokers appear to choose different strategies for cessation, making a variety of smoking cessation strategies available to employees may meet the needs of more employees and increase participation in workplace programmes	Moher et al. 2005 1++ Waranch et al. 1993 2+	Offer smoking cessation support No behaviour change coding possible.
	Evidence statement 13 According to a 2+ study, the majority of employed smokers are not ready to quit smoking. Therefore, smoking cessation materials and programmes need to recognise that smokers are at different stages of change rather than tailoring their materials only to those smokers who are highly motivated to quit. The researchers argue that proactive interventions are required, including access to subsidised pharmacological cessation aids, monetary incentives for assessment of smoking risk, direct personalized feedback, media/social marketing campaigns, and changes in the social norms and physical environment at the workplace, in public	Abrams and Biener 1994 2+	Not applicable – no behaviour change outcome.

Relevant recommendation (4)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	places, and in the home. Although this is an American study, its findings are likely to be broadly applicable to a UK setting		
The guidance states that the following six smoking cessation interventions have been proven to be effective:			
Brief interventions Brief interventions for smoking cessation involve opportunistic advice, discussion, negotiation or encouragement and are delivered by a range of primary and community care professionals, typically within 5–10 minutes. The package provided depends on a number of factors including the individual's willingness to quit, how acceptable they find the intervention and previous methods they have used. It may include one or more of the following: • simple opportunistic advice • an assessment of the individual's commitment to quit • pharmacotherapy and/or behavioural support • self-help material • referral to more intensive support such as the NHS Stop Smoking Services.	No evidence statements. References: • NICE PH1 (see NICE PH1 extraction table above) • NICE PH5 evidence review **Author: Most relevant evidence statements from PH5 evidence review identified as Evidence statement 2 from R4 (also covered above)** **Evidence statement 2 from NICE public health guidance 5.** A 1++ systematic review and a 1+ meta-analysis of the available international literature indicates that the most effective smoking cessation interventions in workplace settings are those interventions that have proven effectiveness more broadly. There is strong evidence that group therapy, individual counselling and pharmacological treatments all have an effect in facilitating smoking cessation. However, both reviews failed to identify effects due to particular intervention type. There is also evidence that minimal interventions including brief advice from a health professional are effective. Self-help manuals appear to be less effective, although there is limited evidence that interventions tailored to the individual have some effect.	See NICE PH1 extraction table above. PH5 **Evidence statement 2** 1++ systematic review (Moher et al. 2005 1++ [Cochrane]) **NB: This has been updated see Cochrane review on Workplace interventions for smoking cessation 2008** 1+ meta-analysis (Fisher et al. 1990 1+) "Incentives do not increase cessations rates but do increase participation"	Intervention: Brief interventions Intervention Function 1 Education BCT Cluster 1 "Social Support" BCT4 Pharmacological support
Individual behavioural counselling This is a face to face encounter between someone who smokes and a counsellor trained in assisting smoking cessation.	No evidence statements. References: NICE PH5 evidence review **See Evidence statement 2 from R4 above**	PH5 **Evidence statement 2**	BCT3 Social support (unspecified)
Group Behaviour therapy Group behaviour therapy programmes involve scheduled meetings where people who smoke receive information, advice and encouragement and some form of behavioural intervention (for example, cognitive behavioural therapy) delivered over at least two sessions.	No evidence statements. References: NICE PH5 evidence review **See Evidence statement 2 from R4 above**	PH5 **Evidence statement 2**	BCT3 Social support (unspecified)
	No evidence statement. References. NICE (2006c) Effectiveness review for smoking cessation programme [online]. Available from: www.nice.org.uk/page.aspx?o=404427 Deemed relevant from reference above: "**Evidence statement 5**: Overall, two studies provide a body of 2++ evidence that group interventions group may produce higher CO-validated quit rates at 4 weeks than one-on-one interventions. However, one-to-one interventions are also effective and many clients express a clear preference for one-to-one treatment. Moreover, in some contexts (particularly rural areas), group treatment is simply unfeasible. Therefore, one-to-one interventions are a crucial component of the NHS stop smoking services as	Effectiveness review for smoking cessation programme. Evidence statement 5. McEwan et al. 2005 (2++) Judge et al. 2005 (2++)	Subgroup: treatment delivery methods group vs. individual No behaviour change coding possible.

Relevant recommendation (4)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	smokers need to be given a choice of treatment options. As both studies all took place within the English smoking cessation services, they are directly applicable to the target population."		
	No evidence statement. References. Stead and Lancaster 2005: Systematic review of group behaviour therapy programmes for smoking cessation. A total of 53 trials met inclusion criteria for one or more of the comparisons in the review. Thirteen trials compared a group programme with a self-help programme; there was an increase in cessation with the use of a group programme (N = 4375, relative risk (RR) 1.98, 95% confidence interval (CI) 1.60 to 2.46). There was statistical heterogeneity between trials in the comparison of group programmes with no intervention controls so we did not estimate a pooled effect. We failed to detect evidence that group therapy was more effective than a similar intensity of individual counselling. There was limited evidence that the addition of group therapy to other forms of treatment, such as advice from a health professional or nicotine replacement, produced extra benefit. There was variation in the extent to which those offered group therapy accepted the treatment. Programmes which included components for increasing cognitive and behavioural skills were not shown to be more effective than same length or shorter programmes without these components.	Stead and Lancaster 2005 www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD001007/frame.html (updated 2008)	BCT3 Social support (unspecified)
Pharmacotherapies Stop smoking advisers and healthcare professionals may recommend and prescribe nicotine replacement therapy (NRT) or bupropion as an aid to help people to quit smoking, along with giving advice, encouragement and support. Before prescribing a treatment, they take into account the person's intention and motivation to quit and how likely it is they will follow the course of treatment. They also consider which treatments the individual prefers, whether they have attempted to stop before (and how), and if there are medical reasons why they should not be prescribed NRT or bupropion.	No evidence statement. References. NICE 2002: www.nice.org.uk/TA039 **Not applicable (Note on NICE website (09Aug12) states this guidance has been replaced by PH10 Smoking Cessation Services 2008)** NICE PH5 evidence review **RD: See Evidence statement 2 from R4 above**	See evidence statement 2 from PH5 R4 above	BCT4 Pharmacological support
Self-help materials Self-help materials comprise any manual or structured programme, in written or electronic format, that can be used by individuals in a quit attempt without the help of health professionals, counsellors or group support. Materials can be aimed at anyone who smokes,	No evidence statement. References. Lancaster and Stead 2005b: **Main results** "We identified 68 trials. Thirty-four compared self-help materials to no intervention or tested materials used in addition to advice. In 12 trials in which self-help was compared to no intervention there was a pooled effect that just reached statistical significance (N = 15,711; risk ratio [RR] 1.21; 95% confidence interval [CI] 1.05 to 1.39). This analysis excluded two trials with strongly positive	Lancaster and Stead 2005b: Self-help interventions for smoking cessation 2005 (updated 2008)	Intervention Function 1 Education

Relevant recommendation (4)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
particular populations (for example, certain age or ethnic groups) or may be interactively tailored to individual need	outcomes that introduced significant heterogeneity. Five further trials in which the control group received alternative written materials did not show evidence for an effect of the smoking self-help materials. We failed to find evidence of benefit from adding self-help materials to face-to-face advice, or to nicotine replacement therapy. There were 25 trials using materials tailored for the characteristics of individual smokers, where meta-analysis supported a small benefit of tailored materials (N = 28,189; RR 1.31; 95% CI 1.20 to 1.42, I^2 = 19%). The evidence is strongest for tailored materials compared to no intervention, but also supports tailored materials as more helpful than standard materials. Part of this effect could be due to the additional contact or assessment required to obtain individual data. A small number of other trials failed to detect benefits from using additional materials or targeted materials, or to find differences between different self-help programmes.”		
	No evidence statement. References NICE PH5 evidence review: **RD: See Evidence statement 2 from R4 above**	See evidence statement 2 from PH5 R4 above.	
Telephone counselling and quitlines Telephone counselling and quitlines provide proactive or reactive advice, encouragement and support over the telephone to anyone who smokes who wants to quit, or who has recently quit.	No evidence statement. References Stead et al. a Cochrane systematic review on Telephone counselling for smoking cessation. The main results are quoted below from the study abstract. **Main results** Sixty-five trials (RCTs or quasi RCTs) met the inclusion criteria. Among smokers who contacted helplines, quit rates were higher for groups randomized to receive multiple sessions of proactive counselling (nine studies, >24,000 participants, risk ratio (RR) for cessation at longest follow up 1.37, 95% confidence interval (CI) 1.26 to 1.50). There was mixed evidence about whether increasing the number of calls altered quit rates but most trials used more than two calls. Two studies comparing different counselling approaches during a single quit-line contact did not detect significant differences. Of three studies that provided access to a hotline two detected a significant benefit and one did not. Telephone counselling not initiated by calls to helplines also increased quitting (44 studies, >24,000 participants, RR 1.29, 95% CI 1.20 to 1.38). In the subgroup of studies offering 1-2 calls the effect was small and not significant. A further seven studies were too diverse to contribute to meta-analyses and are discussed separately. **Authors' conclusions** Proactive telephone counselling helps smokers interested in quitting. There is some evidence of a dose response; one or two brief calls are less likely to provide a measurable benefit. Three or more calls increase the chances of quitting compared to a minimal intervention such as providing standard self-help materials, brief advice, or compared to pharmacotherapy alone. Telephone quitlines provide an important route of access to support for smokers, and call-	Stead et al. 2006: Telephone counselling for smoking cessation (updated 2009) Stead LF, Perera R, and Lancaster T. Telephone counselling for smoking cessation. Cochrane Database of Systematic Reviews 2006, Issue 3. Art. No.: CD002850. DOI: 10.1002/14651858.CD002850.pub2	BCT3 Social support (unspecified)

Relevant recommendation (4)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	back counselling enhances their usefulness.		
	References: NICE 2006b: http://www.nice.org.uk/nicemedia/live/11381/43914/43914.pdf **RD: No direct reference to telephone counselling or quitlines in this evidence review**	None	No behaviour change coding possible.
	References: NICE (2006c) Effectiveness review for smoking cessation programme [online]. Available from: www.nice.org.uk/page.aspx?o=404427 **RD: No direct reference to telephone counselling or quitlines in this evidence review**	None	No behaviour change coding possible.

PH6 Behaviour change (2007)

This was a review of reviews with a targeted search of existing systematic reviews. Most relevant section s is the delivery subsection of principle 4 on individual-level interventions and programmes. Evidence was available across 5 health topics and they are summarised separately below.

Evidence Review 1 – Effectiveness review http://www.nice.org.uk/nicemedia/live/11868/44521/44521.pdf .

Quality appraisal in NICE public health guidance 6:
Reviews were graded both for the quality of the review itself (e.g. likelihood of bias) and for the type of evidence it was reviewing (e.g. RCTs or non-RCTs). Reviews were graded for the likelihood of bias as ++ (high quality, lowest level of bias), + (good quality, low level of bias) or – (variable quality with greater degree of bias). Bias is scored according to the 'systematicity' of the review process – further detail is provided in the main body of the report. Reviews were categorised according to the study types which they included as follows: RCTs only (1), other study types (2), or a mixture of both (1and2). These two scores were then combined, so that, for instance, 1++ denotes a review of RCTs of high quality (with the lowest risk of bias). Added to this was a score for relevance to the UK – as detailed below.

This public health guidance document and underlying evidence review contributed to evidence statements 1, 2, 3, 5, 6, 8, 9, 15 and 18 in Review 1.

Relevant recommendation (4)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
Principle 4 Select interventions that motivate and support people to: 1. understand the short, medium and longer-term consequences of their health-related behaviours, for themselves and others 2. feel positive about the benefits of health-enhancing behaviours and changing their behaviour 3. plan their changes in terms of easy steps over time 4. recognise how their social contexts and relationships may affect their behaviour, and identify and plan for situations that might undermine the changes they are trying to make 5. plan explicit 'if-then' coping strategies to prevent relapse 6. make a personal commitment to adopt health-enhancing behaviours by setting (and recording) goals to undertake clearly defined behaviours, in particular contexts, over a specified time 7. share their behaviour change goals with others.	No evidence statements or references given in PH6 full guidance for this section.	Not referenced.	Based on recommendation wording: 1. BCT80 Information about social and environmental consequences 2. Intervention Function 2 Persuasion 3. BCT Cluster 11 "Goals and Planning". Not specific enough for BCT29 Graded tasks although implies this.. 4. BCT61 Problem solving 5. BCT61 Problem solving and BCT64 Action planning 6. BCT Cluster 3 "Feedback and Monitoring", BCT68 Commitment, BCT62 Goal setting (behaviour), BCT64 Action planning 7. No BCT

PH6 Research question
What is the evidence for the effectiveness of interventions to prevent, reduce, or promote health behaviours, at what level (individual / community / population), and for which population groups (e.g. young people, pregnant women, elderly)?

PH6 Smoking:

22 systematic reviews evaluated interventions to aid smoking cessation, prevent relapse, or prevent people taking up smoking at an individual level, 14 of these were in the general adult population, 2 focused on pregnant women, and 5 on the effectiveness of health professional led interventions and 1 evaluated interventions for smokeless tobacco use.

Evidence summary for interventions aimed at individuals from PH6

"Interventions that showed a positive effect include advice from health professionals, the rapid smoking form of aversion therapy, self-help materials, telephone counselling (compared to less intensive interventions), nursing interventions, group counselling (which is also more effective than self-help) and oral examination and feedback for reducing smokeless tobacco use. In addition, interventions to promote smoking cessation or reduction with pregnant women are generally effective across the range of intervention types and indicate that pregnancy may be a point in the lifecourse that is amenable to positive behaviour change. Relapse prevention interventions were also successful with pregnant women, although this was only supported by a single study. Less clear, poor quality or inconclusive evidence of effect was found for social support interventions (e.g. buddy systems or friends and family), relapse prevention, biomarker feedback or biomedical risk assessment, exercise, and interventions by community pharmacy personnel or dentists. Interventions that had evidence of no effectiveness included hypnotherapy, and stage-based approaches to changing smoking behaviour." Individual elements extracted below only.

Health area	Population	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
Smoking	All adults (14 systematic reviews)	There is good quality evidence (1+, A), that hypnotherapy is not effective in achieving smoking cessation.	Abbot et al., 1998 Cochrane 1+ A	Hypnotherapy No behaviour change coding possible.
		There is evidence of good quality (1+,C), that no conclusions can be made about the impact of partner support on smoking cessation. There is additional evidence of variable quality (1-, C), which shows some effect of buddy systems in a smokers clinic.	Social Support Park et al., 2004 1+ Cochrane Social Support May and West, 2000 "buddy systems" 1-	Counselling support, partner support BCT3 Social support (unspecified) Self-help materials Intervention Function 1 Education
		There is evidence of good quality (1+, A), that self-help materials may increase quit rates compared to no intervention, but the effect is likely to be small. There is no evidence that they have an additional benefit when used alongside other interventions such as advice from a healthcare professional, or nicotine replacement therapy. There is evidence that materials that are tailored for individual smokers are effective, and are more effective than untailored materials, although the absolute size of effect is still small.	Self-help materials and the adjuncts to self-help (computer-generated feedback, telephone hotlines and pharmacotherapy) Lancaster and Stead, 2005 Cochrane 1+	
		There is evidence of good quality (1+, C), that shows a positive effect of telephone counselling (compared to less intensive interventions) on smoking quit rates.	Stead et al., 2003 Cochrane review 1+ C	
		There is evidence of good quality (1+, C), which shows that group counselling is more effective than self-help and no intervention for smoking cessation	Lancaster and Stead, 2005a Cochrane review 1+ C	
		There is evidence of good quality (1+, A), that there is no evidence of effectiveness in using biomedical risk assessment along with counselling to promote smoking cessation. There is evidence of variable quality (1-, B) that shows a small effect of using biomarker feedback with counselling.	Bize et al., 2005 Cochrane review (1+, A) McClure, 2002 systematic review (1-, B)	BCT14 Biofeedback
		There is evidence of good quality (1+, B), that rapid smoking is effective in aiding smoking cessation. There is evidence that other aversive methods are not effective.	Hajek and Stead, 2001	Aversive techniques No behaviour change coding possible.
		There is evidence of good quality (1and2+, A), that shows insufficient evidence to support the use of any specific intervention for helping smokers who have successfully quit for a short time to avoid relapse.	Hajek et al., 2005 Cochrane review (1and2+, A)	BCT61 Problem solving
		There is evidence of variable quality (1-, C), which shows no effect of stage-based approaches to changing smoking behaviour.	Riemsma et al., 2003 systematic review (1-, C)	Stage based approaches No behaviour change coding possible.
		There is evidence of variable quality (1-, A), that shows an inconclusive effect of motivational intervention in smoking cessation.	Dunn et al., 2001 (1-, A) Evaluated brief motivational interviewing interventions across several behaviours (including cigarette smoking)	Intervention Function 2 Persuasion
		There is evidence from two reviews of good quality (both scoring 1+, B), that shows an inconclusive effect of exercise interventions for smoking cessation.	Nishi et al., 1998 (1+, B)	Exercise No behaviour change coding possible.

Health area	Population	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
		There is evidence of good quality (1++, B), which shows an effect of behavioural interventions which included an oral examination and feedback for reducing smokeless tobacco use.	Ebbert et al., 2004 Cochrane review (1++, B)	Smokeless tobacco (Topic not applicable)
	Pregnant women (2 Systematic reviews)	There is evidence of good quality (1++, A), which shows significant effects of a wide range of interventions with pregnant women on smoking reduction and smoking cessation. There is evidence of good quality (1++, C), which shows a modest effect of theoretically based, multi-component interventions provided during the postpartum period, on postpartum smoking relapse rates. However, this evidence only comes from a single study.	Lumley et al., 2004 Cochrane systematic review (1++, A) Edwards et al., 2000 (1++, C)	Multiple interventions No behaviour change coding possible.
	Health professional led interventions	There is evidence of good quality (1+, A), which shows a small effect of physician advice on the odds of quitting for all smokers. There is also evidence of a small effect of intensive versus minimal advice on smoking cessation. There is evidence of variable quality (1and2-, B), which shows an effect of dentists' advice to quit smoking on dental patients. There is evidence of variable quality (1-, A), that shows little effect of smoking prevention interventions delivered via medical or dental providers' offices in preventing or reducing tobacco smoking in young people (<21 years). There is evidence of good quality (1+, A), that shows a moderate effect on nursing interventions for smoking cessation in non-hospitalised people. There is evidence of good quality (1+, A), that shows an inconclusive effect of interventions by community pharmacy personnel for smoking cessation.	Lancaster and Stead, 2004 Cochrane systematic review (1+, A) Brothwell, 2001 (1and2-, B) Christakis et al., 2003 (1-, A) Rice and Stead, 2004 Cochrane review (1+, A) Sinclair et al., 2004 Cochrane review (1+, A)	Intervention Function 1 Education - health professional advice Lancaster and Stead, 2004 Cochrane systematic review (1++, A) (Intervention Function 1 Education) Brothwell, 2001 (1and2-, B) (Intervention Function 1 Education) Christakis et al., 2003 (1-, A) (no code) Rice and Stead, 2004 Cochrane review (1+, A) (no code) Sinclair et al., 2004 Cochrane review (1+, A) (no code)

PH6 Physical activity

8 systematic reviews evaluated interventions to increase or promote the uptake of physical activity at an individual level, 6 were aimed at the general adult population and two evaluated interventions for the older population.

Evidence summary for interventions aimed at individuals from PH6

"Interventions such as professional advice and guidance (with continued support) may be moderately effective in the short term (less than three months) in increasing physical activity for the general population. However, effectiveness is not necessarily sustained over a longer time period (e.g. twelve months). Many of the studies were limited by the recruitment of motivated volunteers, and no studies examined the effect of interventions on participants from varying socioeconomic or ethnic groups. In addition even those interventions which are moderately effective in increasing exercise are not meeting a predetermined threshold of physical activity. This conclusion was also supported by the findings from the review of interventions for the older population, which found a small but short-lived effect of home-based, group based, and educational physical activity interventions on increasing physical activity. There is inconclusive evidence of effect for biomarker feedback or brief motivational interventions on physical activity. There is evidence of no effect for stage of change interventions to increase levels of physical activity."

Health area	Population	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
Physical activity	All adults	There is evidence of good quality (1++, A), that shows moderate evidence of effectiveness of individualised physical activity interventions for increasing (in the short term) self-reported physical activity levels. However, other evidence of good quality (1 and 2+, A) indicates that most studies have no effect at the first follow-up (three months or more after the end of intervention).	Hillsdon et al., 2005 Cochrane review (1++, A) Holtzman et al., 2004 (1and2+, B)	Multiple interventions described in brief in Hillsdon et al. 2005 :one to one counselling/advice and/or group counselling (BCT3 Social support (unspecified)/advice; self-directed or prescribed physical activity; supervised or unsupervised physical activity (BCT23 Behavioural practice/rehearsal); home-based or facility-based physical activity; on-going face-to-face support; telephone support (BCT3 Social support (unspecified); written support material; and self-monitoring (BCT11 Self-monitoring of outcomes).
		There is evidence of good quality (1++, A), that shows a non-significant effect for reaching a predetermined threshold of physical activity (e.g., meeting current public health recommendations).	Hillsdon et al., 2005 Cochrane review (1++, A)	No behaviour change coding possible.
		There is evidence of variable quality (1-, B), that shows an inconclusive effect of biomarker feedback or brief motivational interventions on physical activity.	McClure, 2002 (1-, B)	BCT14 Biofeedback Intervention Function 2 Persuasion - motivational interventions
		There is evidence of good quality (1++, C), that show no effect of 'stage of change' based interventions on physical activity.	van Sluijs et al., 2004).(1++, C)	Stage of change Not applicable
		There is evidence of good quality (1and2+, C), that shows a mixed and inconclusive effect of counselling interventions on physical activity.	Eden et al., 2002 (1and2+, C)	10RCTs in Eden et al., 2002.3RCT interventions compared with each other. These 3 included goal setting (BCT63 Goal setting (outcome). No codes for remaining 7 from evidence table.
	Older people	There is evidence of from two reviews (1++, A; 1-, C), that shows a small but short-lived effect of home-based, group-based, and educational physical activity interventions on increasing physical activity among older people.	van-der-Bij et al., 2002 (1++, A) Conn et al., 2003 (1-,C)	Intervention Function 1 Education

PH6 Alcohol misuse

Six reviews evaluated interventions for adult problem drinkers. One review evaluated home visits for pregnant women who were problem drinkers, two targeted convicted drink drivers, and three further reviews covered problem drinkers in general.

Evidence summary for interventions aimed at individuals from PH6

"There was evidence of a small positive effect of brief behavioural counselling interventions in reducing alcohol intake (mean reduction of approximately 4 drinks per week) in problem drinkers. There was variable quality evidence showing a small, positive effect of behavioural counselling interventions in reducing alcohol consumption. There was insufficient evidence of effect for home visits for women who were alcohol misusers. For drink drivers, there was evidence of an effect of alcohol interlock programmes (car ignition locked until the driver provided an appropriate breath specimen), but the effect of other interventions was inconclusive due to the variable quality of the review."

Health area	Population	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
Alcohol misuse	Problem drinkers	There is evidence of variable quality (1-, C), that shows a small effect of behavioural counselling interventions in reducing alcohol consumption among problem drinkers. There is evidence of good quality (1++, A; 1and2+, A), that shows an effect of brief behavioural counselling interventions in reducing alcohol intake among problem drinkers.	Walters Glenn, 2000 (1-, C) Evaluated behavioural self-control interventions that they mapped to a cluster called "Regulation". Whitlock et al., 2004 (1and2+, A) brief multi-contact behavioural counselling intervention. Bertholet et al., 2005 (1++, A) (looked at same brief interventions as Whitlock 2004)	**Behavioural counselling** "Behavioural self-control training" included: • abstinence training (BCT Cluster 5 "Repetition and Substitutions") • standard programme (no code) • education (Intervention Function 1 Education) • no contact (no code) • information (Intervention Function 1 Education) • coping skills (possibly BCT 61 Problem Solving but not 100% clear) • waiting-list controls (no code) • counselling (BCT3 Social support (unspecified)) • self-monitoring only (BCT10 Self-monitoring of behaviour)
	Pregnant women	There is evidence of good quality (1++, C), that shows insufficient evidence of effect for home visits during pregnancy in reducing alcohol consumption.	Doggett C, 2005	**Home visits** No behaviour change coding possible.
	Drink drivers	There is evidence of good quality (1and2++, C), that shows a possible effect of alcohol ignition interlock programmes to reduce drink driving offences. There is no evidence on effectiveness of the programmes once the device has been removed. There is evidence of variable quality (1and2-, C), that shows an effect of drink-driving remediation interventions in reducing drink-driving repeat offences and alcohol-related crashes.	Willis et al., 2004 Cochrane review (1and2++, C) Wells et al., 1995 (1and2-, C) (multiple interventions included from education, education alone, education with another intervention, counselling, probations, alcoholics anonymous, antabuse)	**Alcohol ignition interlock programmes** (vehicle doesn't start if breath specimen alcohol reading is too high) No behaviour change coding possible. **Driving remediation** No behaviour change coding possible.

PH6 Healthy eating (diet)

Two systematic reviews evaluating behavioural or psychological interventions to promote healthy eating were identified.

Evidence summary for interventions aimed at individuals from PH6
There was evidence of a positive effect of nutritional counselling interventions delivered to a primary care population in changing eating habits. There was no conclusive evidence of effect of interventions (health education, counselling, changes in environment and changes in policy) to encourage pregnant women to eat healthily.

Health area	Population	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
Diet	All adults	There is evidence of good quality (1+, C), that shows a positive effect of nutritional counselling interventions delivered to a primary care population in changing eating habits.	Ammerman et al., 2002.	Nutritional counselling (counselling not defined in evidence table) No behaviour change coding possible.
	Pregnant women	There is evidence of good quality (1and2+, A), that shows no conclusive evidence on the effectiveness of interventions to encourage pregnant women and women of childbearing age to eat healthily.	Van Teijlingen et al., 1998.	No behaviour change coding possible.

PH6 Sexual health

No systematic reviews were identified evaluating individual level interventions to reduce sexual risk taking in young people.

PH6 Is there any evidence to suggest that some interventions are effective / ineffective across the range of health behaviours?

Effective Individual level interventions

- Interventions aimed at pregnant women (e.g. smoking cessation, nutritional advice, or exercise) show some evidence of effectiveness.
- Physician advice or counselling was effective for smoking cessation, reducing alcohol consumption and promoting healthy eating.
- Counselling interventions appear to have an effect in tobacco cessation and alcohol consumption, but the evidence was inconclusive for preventing unwanted pregnancies, and there was no evidence of effect for illicit drug use.

Inconclusive

- Motivational interventions and biomarker feedback have inconclusive evidence of effectiveness for smoking cessation and physical activity.

Ineffective

- Hypnotherapy was not found to be effective for smoking cessation.
- Stage based approaches are not effective in either smoking cessation or the promotion of physical activity.

PH6 Q: What is the evidence for the effectiveness of interventions in targeting health inequalities within particular population subgroups?

Our review of reviews found no evidence that was substantial enough to provide data on inequalities related to the following:

- Inequalities in smoking and tobacco use; physical activity; alcohol misuse; healthy eating; illicit drug use; and sexual risk taking among young people.
- Inequalities in access to interventions to promote change in attitude, knowledge or behaviour
- Inequalities in recruitment to interventions of ‘hard to reach’ groups
- Inequalities in outcomes of interventions

PH10 Smoking cessation services (2008)

This guidance document does not contain recommendations relating to individual behaviour change. However, it refers to six “proven smoking cessation interventions” which are referenced. These interventions, and evidence behind their effectiveness, are identical to those described in PH5 so are not repeated here (see NICE public health guidance 5 above).

This public health guidance document and underlying evidence review did contribute directly to evidence statements in Review 1 as it cross referenced NICE public health guidance 5 which fed into evidence statements 2, 3, 4, 5 and 6 in Review 1.

PH11 Maternal and child nutrition (2008)

Recommendations that advised all pregnant women to take vitamin D and folic acid supplements were not included as individual behaviour change interventions. This advice was viewed as having only a clinical focus e.g. Vitamin D to prevent rickets and folic acid to prevent neural tube defects without a health promotion element. Interventions aimed at weight loss targeted at obese mothers that also contained elements of physical activity and or diet were included.

Relevant evidence reviews:

- PH11 Maternal and child nutrition: review 3 post partum
- PH11 Maternal and child nutrition: review 3 post-partum evidence tables

This public health guidance document and underlying evidence review contributed to evidence statement 13 in Review 1.

Relevant recommendation (6)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R6. Target pop: Pregnant women who have a pre-pregnancy body mass index (BMI) over 30, and those with a BMI over 30 who have a baby or who may become pregnant. Inform women who have a BMI over 30 about the increased risks this poses to themselves and their babies and encourage them to lose weight before becoming pregnant or after pregnancy. Provide a structured programme that: • addresses the reasons why women may find it difficult to lose weight, particularly after pregnancy • is tailored to the needs of an individual or group • combines advice on healthy eating and physical exercise (advising them to take a brisk walk or other moderate exercise for at least 30 minutes on at least 5 days of the week) • identifies and addresses individual barriers to change • provides ongoing support over a sufficient period of time to allow for sustained lifestyle changes. **Evidence statements 3.1, 3.2, 3.3, 3.4, 3.5, 3.6; Goldberg 2006; CEMACH 2003; Heslehurst et al. 2007**	**3.1** There is evidence from four RCTs (Leermakers et al. 1998; Lovelady et al. 2000 and 2006; McCrory et al. 1999; and O'Toole et al. 2003 all 1-) that diet and exercise programmes are effective in enabling some postpartum women to lose weight gained during pregnancy. This finding is based on US studies of women not noted to be from disadvantaged groups and who appear to be highly motivated to lose weight.	Leermakers et al. 1998 Lovelady et al. 2000 and 2006 McCrory et al. 1999 O'Toole et al. 2003	See characteristics of effective programmes below.
	3.2 There is evidence from 2 RCTs (Lovelady et al. 2000 ,2006; McCrory et al. 1999 both 1-) that a combination of diet and physical activity results in more effective and preferable weight loss than diet alone or physical activity alone.	Lovelady et al. 2000 ,2006 McCrory et al. 1999	See characteristics of effective programmes below.
	3.3 There is evidence from an RCT (McCrory et al. 1999, 1-) that physical activity as part of a combined diet and physical activity intervention to promote weight loss, is more effective when frequent and regular, than when vigorous and less frequent.	McCrory et al. 1999	See characteristics of effective programmes below.
	3.4 There is evidence from 2 RCTs (Leermakers et al. 1998; O'Toole et al. 2003 both [1-]) that integrated programmes of activity which support participants in combining diet and regular physical activity in order to promote weight loss in the post-partum period are more effective than interventions which provide information alone. **3.5** There is evidence from 2 RCTs (Leermakers et al. 1998; O'Toole et al. 2003 both 1-) that the characteristics of programmes which are effective in enabling some women to lose weight in the post-partum period are those which: combine diet and physical activity; include strategies for behaviour change; tailor the intervention to individual or group needs; include	Leermakers et al. 1998 O'Toole et al. 2003	See characteristics of effective programmes below. **Leermakers et al. 1998** 16 written lessons including homework, about nutrition, exercise and behaviour change strategies (Intervention Function 1 Education) [no further detail reported], tailored to special needs of new mothers) telephone contact from program staff (1-2 calls per week lasting 5-15m focusing on eating and exercise progress (BCT3 Social support (unspecified)), **goal-setting (BCT63 Goal setting (outcome))** and **problem-solving (BCT61 Problem solving)** Women were asked to **monitor** their calorie and fat intake (BCT11 Self-monitoring of outcomes) and their exercise daily and return their records by mail **O'Toole et al. 2003**

Relevant recommendation (6)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	some group sessions and written materials; provide on-going support and contact with programme staff; and are of a sufficient duration to make sustained lifestyle changes.		STR subjects received individualised diet and physical activity prescriptions (not enough detail for BCT64 Action planning), kept daily food and activity diaries (BCT10 Self-monitoring of behaviour), and met for group educational sessions dealing with nutrition and physical activity strategies (weekly for first 12 weeks, fortnightly for the next 2 months and monthly up to 1 year post-partum) (BCT36 Instructions on how to perform a behaviour). Heart rate monitors were provided for this group to help establish the relationship between heart rate and energy cost (kcal/min)(BCT11 Self-monitoring of outcomes)
	3.6 There is evidence from one RCT (McCrory et al. 1999 1-) that short term weight loss of 1kg /week achieved through a combination of diet plus physical activity in healthy postpartum women has no detrimental effect on milk quantity or quality and does not appear to affect infant weight gain. A second RCT (Lovelady et al. 2000, 2006,1-) combining diet and physical activity in healthy postpartum women (BMI 25-30) over a longer time period and resulting in a mean weight loss of 0.5kg/week did not appear to affect infant weight or length. However the study may not have been sufficiently powered to demonstrate such effects.	McCrory et al. 1999 Lovelady et al. 2000, 2006	Not applicable - safety
	No evidence statement, references expert testimony.	**Expert paper maternal diet and breast feeding** Goldberg G (2006) Nutrition and breastfeeding [online]. http://www.nice.org.uk/nicemedia/live/11943/43906/43906.pdf	No behaviour change coding possible.
	No evidence statement	**CEMACH 2003** Confidential Enquiry into Maternal and Child Health (CEMACH) (2003) Why mothers die 2000-2002. Report on confidential enquiries on maternal deaths in the UK. England, Wales and Northern Ireland	No behaviour change coding possible.
	No statement, references non RCT evidence.	**Heslehurst et al. 2007** Heslehurst N, Ellis LJ, Simpson H et al. (2007) Trends in maternal obesity incidence rate, demographic predictors, and health inequalities in 36,821 women over a 15 year period. British Journal of Obstetrics and Gynaecology 114: 187–194.	No behaviour change coding possible.

PH15 Identifying and supporting people most at risk of dying prematurely (2008)

This document constitutes NICE's formal guidance on what works in finding and supporting those most at risk of early death and improving their access to services. The recommendations have been developed for smoking cessation services and the provision of statins. Only one recommendation was identified as relevant to individual behaviour change in this guidance on first pass appraisal. Specifically a short subsection of recommendation 2: "Targeting adults who are disadvantaged" that included:

…

- "Encourage and support people who are disadvantaged to follow the treatment that they have agreed to. For example, encourage them to *use self-management techniques (based on an individual assessment) to solve problems and set goals*. It could also involve providing vouchers for treatments (such as *nicotine replacement therapy*). (For recommendations on the principles of behaviour change, see : 'Behaviour change at population, community and individual levels' [NICE public health guidance 6]."

…

However, on reviewing the evidence behind this sub recommendation we found it is aimed at improving adherence to cardiac rehabilitation within health care services. This adherence focus does not constitute a behavioural change intervention or technique by our definition and so was not included.

This public health guidance document and underlying evidence review did not contribute directly to evidence statements in Review 1.

PH24 Alcohol-use disorders - preventing harmful drinking (2010)

Harmful drinking was defined by NICE as a pattern of alcohol consumption that is causing mental or physical damage. Hazardous drinking was defined as a pattern of alcohol consumption that increases someone's risk of harm. Some would limit this definition to the physical or mental health consequences (as in harmful use). Others would include the social consequences. The term is currently used by World Health Organisation to describe this pattern of alcohol consumption. It is not a diagnostic term.

Extended brief intervention
This is motivationally-based and can take the form of motivational-enhancement therapy or motivational interviewing. The aim is to motivate people to change their behaviour by exploring with them why they behave the way they do and identifying positive reasons for making change. In this guidance, all motivationally-based interventions are referred to as 'extended brief interventions'.

Recommendations relating to which screening tool to use to identify harmful drinkers (adults and young people) are covered within this guidance but are not included below as they do not seek or specify methods of behaviour change, they represent only a means to identify the group who will be the target of subsequent behaviour change interventions or techniques, such as a brief interventions.

Evidence review: Screening and Brief Interventions for Prevention and Early Identification of Alcohol Use Disorders in Adults and Young People

This public health guidance document and underlying evidence review contributed to evidence statements 16, 17 and 18 in Review 1.

Relevant recommendation (8,10,11)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R8: extended brief interventions with young people aged 16 and 17 years who have been identified via screening as drinking hazardously or harmfully. • Ask the young person's permission to arrange an extended brief intervention for them. • Appropriately trained staff should offer the young person an extended brief intervention. • Provide information on local specialist addiction services to those who do not respond well to discussion but who want further help. Refer them to these services if this is what they want. Referral must be made to services that deal with young people. • Give those who are actively seeking treatment for an alcohol problem a physical and mental assessment and offer, or refer them for, appropriate treatment and care. **Evidence statements** 5.1, 5.2, 5.5, 5.6, 5.7, 5.9, 5.10, 5.11, 7.3, 7.4, 7.5, 7.7, e5.1; modelling statements M2, M3 *(NB none of these evidence statements provided evidence for the effectiveness of*	**Evidence statement 6.1** The 27 included systematic reviews provided a considerable body of evidence supportive of the effectiveness of brief interventions for alcohol misuse in reducing alcohol consumption, mortality, morbidity, alcohol-related injuries, alcohol-related social consequences, healthcare resource use and laboratory indicators of alcohol misuse.	**27 Systematic Reviews:** Key characteristics of included systematic reviews and main findings are presented in Appendix 15 of http://www.nice.org.uk/nicemedia/live/13001/49007/49007.pdf The quality of reviews was generally of a high standard in terms of study design characteristics and clarity of reporting. Majority conducted in primary care, but limited evidence was also identified for other healthcare settings. Study populations were primarily adults. From evidence statement 6.5 The evidence base for the effectiveness of alcohol brief interventions among young people was therefore inconclusive based on mixed results from 8 (+ and ++ studies)	Intervention: brief interventions Mixed interventions and outcomes No behaviour change coding possible.
	Evidence statement 6.2: Six systematic reviews (++)1-6 demonstrated that interventions delivered in primary care are effective in reducing alcohol-related negative outcomes. Three systematic reviews specifically focusing on the use of brief interventions in emergency care (+)7, (++)8, (++)9 found limited evidence for the effectiveness of brief interventions for alcohol misuse in emergency care settings. A further review (++)10 presented inconclusive evidence of the effectiveness of brief interventions in inpatient and outpatient settings. A systematic review of brief interventions for alcohol misuse in the workplace presented limited and inconclusive findings for the effectiveness of interventions in this setting.11	1 Ashenden et al., 1997 (Systematic review, ++) (verbal advice plus written materials age 17-69 years) 2 Ballesteros et al., 2004a (Systematic review, ++) (advice, advice+ strategies to reduce consumption, with optional booster sessions, 18+) 3 Bertholet et al., 2005 (Systematic review, ++) (face to face component defined as brief intervention or motivational intervention , most included feedback on consumption, mention of cognitive behavioural techniques) 4 Kaner et al., 2007 (Systematic review, ++) (information and advice) 5 Poikolainen, 1999 (Systematic review, ++) (very brief and extended interventions included, included advice, feedback, written materials, follow-up) 6 Whitlock et al., 2004 (Systematic review, ++) (very brief and brief interventions, uses term “behavioural counselling interventions”) 7 D'Onofrio and Degutis, 2002 (Systematic review, +)	From six effective interventions: BCT3 Social support (unspecified) BCT8 Feedback on behaviour Intervention Function 1 Education

Relevant recommendation (8,10,11)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
extended brief interventions for young people. The evidence statements associated with Recommendation 9 are highly relevant to both R8 and R10)		8 Havard et al., 2008 (Systematic review, ++) 9 Nilsen et al., (2008) (Systematic review, ++) 10 Emmen et al., 2004 (Systematic review, ++) 11 Webb et al., 2009 (Systematic review, ++)	
Evidence statements quoted as for R9 Screening adults but seem to be very relevant to R8 and R10 6.1, 6.2, 6.3, 6.4, 6.10, 7.3, e6.1, e6.2; modelling statement M6; IDE	**Evidence statement 6.3**: Brief interventions are effective in reducing alcohol consumption in both men and women (++),1 (++),2 (++),3 (++)4 (++),5 (++)6 (++)7).	1 Ballesteros et al., 2004a (Systematic review, ++) (see above) 2 Bertholet et al., 2005 (Systematic review, ++) (see above) 3 Whitlock et al., 2004 (Systematic review, ++) (see above) 4 Kahan et al., 1995 (Systematic review, +) (brief intervention delivered by medical professionals 30mins or less for problem drinkers) 5 Kaner et al., 2007 (Systematic review, ++) (see above) 6 Poikolainen,1999 (Systematic review, ++) (see above) 7 Ballesteros et al., 2004b (Systematic review, ++) (assessment of alcohol consumption, safe limits, with or without strategies to reduce consumption, extended interventions had several sessions)	BCT3 Social support (unspecified) BCT8 Feedback on behaviour Intervention Function 1 Education
	Evidence statement 6.4: The majority of included primary evidence was drawn from adult populations with an age range of 12 to 70 years. Therefore, brief interventions for adults have been shown to be effective amongst adult populations.	Applicability: The primary studies included in the systematic reviews included in this assessment were largely drawn from the USA. However, a smaller proportion of the included studies were undertaken in the UK and therefore, the evidence base can be considered to have some applicability to a UK-based setting.	No behaviour change coding possible.
	Evidence statement 6.10: Extensive heterogeneity was evident in the characteristics of evaluated brief interventions. However, limited evidence would suggest that even very brief interventions may be effective in reducing alcohol-related negative outcomes, (++)1 with inconclusive evidence for an additional positive impact resulting from increased dose ((++),2 (++),3 (++)4). Evidence from an additional review (++)5 suggests that brief interventions are effective, with impact of the inclusion of motivational interviewing principles unclear. Applicability: The above systematic reviews included primary studies conducted in primary care (with the exception of the work by Tait and Hulse, which was undertaken in educational and healthcare settings in the USA). The evidence can be considered to have reasonable applicability to the UK.	1 Whitlock et al., 2004 (Systematic review, ++) (see above) 2 Ballesteros et al., 2004a (Systematic review, ++) (see above) 3 Bertholet et al., 2005 (Systematic review, ++) (see above) 4 Kaner et al., 2007 (Systematic review, ++) (see above) 5 Tait and Hulse, 2003 (Systematic review, ++) (motivational interviewing, written materials/telephone contact)	BCT3 Social support (unspecified)
	Evidence Statement 7.3 [top line summary only] There is evidence that implementation of screening and brief intervention would be facilitated by use of environments where alcohol can discussed in a non-threatening way. Integrating screening and advice into general lifestyle discussions might increase the acceptability of screening and brief intervention for users. … [this recommendation is very large and multifaceted, see full guidance document for full details]	Not applicable	Not applicable – concerned with facilitators of implementing brief interventions from qualitative studies rather than core effectiveness of the brief intervention which is more relevant and covered in the previous evidence statements.
	Evidence statements e6.1, e6.2 and M6 relate to cost effectiveness of screening and brief interventions and so are not relevant here.	Not applicable	Not applicable

Relevant recommendation (8,10,11)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R10 Brief advice for adults who have been identified via screening as drinking a hazardous or harmful amount of alcohol. • Offer a session of structured brief advice on alcohol. If this cannot be offered immediately, offer an appointment as soon as possible thereafter. • Use a recognised, evidence-based resource that is based on FRAMES principles (feedback, responsibility, advice, menu, empathy, self-efficacy). It should take 5–15 minutes and should: – cover the potential harm caused by their level of drinking and reasons for changing the behaviour, including the health and wellbeing benefits – cover the barriers to change – outline practical strategies to help reduce alcohol consumption (to address the 'menu' component of FRAMES) – lead to a set of goals. • Where there is an ongoing relationship with the patient or client, routinely monitor their progress in reducing their alcohol consumption to a low-risk level. Where required, offer an additional session of structured brief advice or, if there has been no response, offer an extended brief intervention. **Evidence statement 6.11; modelling statement M6**	**Evidence statement 6.11** Extended brief interventions were demonstrated to be effective in the reduction of alcohol consumption (whereby evaluated interventions consisted of 2 to 7 sessions with a duration of initial and booster sessions of 15 to 50 min[1] or 10 to 15 min in 1 session with number of specific booster sessions of 10 to 15 min duration[2]). **Modelling statement M6** Relates to economic sensitivity data – cost data is not applicable to this review.	1 Kaner et al., 2007 (Systematic review, ++) 2 Ballesteros et al., 2004a (Systematic review, ++) Not applicable	No behaviour change coding possible. Not applicable
R11 Extended brief interventions for adults Adults who have not responded to brief structured advice on alcohol and require an extended brief intervention or would benefit from an extended brief intervention for other reasons. • Offer an extended brief intervention to help people address their alcohol use. This could take the form of motivational	Inference derived from the evidence (IDE)	Inference derived from the evidence	Motivational interviewing and motivational enhancement therapy are not defined here enough to ascribe BCTs. However they generally aim to increase ambivalence about current behaviour and enhance motivation to change and sustain behaviour change Intervention Function 2 Persuasion

Relevant recommendation (8,10,11)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
interviewing or motivational-enhancement therapy. Sessions should last from 20 to 30 minutes. They should aim to help people to reduce the amount they drink to low risk levels, reduce risk-taking behaviour as a result of drinking alcohol or to consider abstinence. • Follow up and assess people who have received an extended brief intervention. Where necessary, offer up to four additional sessions or referral to a specialist alcohol treatment service **IDE**			

PH26 Quitting smoking in pregnancy and following childbirth (2010)

This is NICE's formal guidance on how to stop smoking in pregnancy and following childbirth. The recommendations should benefit women who smoke and who are planning a pregnancy; are already pregnant; or have an infant aged under 12 months They should also benefit the unborn child of a woman who smokes, any infants and children she may have, her partner and others in her household who smoke.

From the recommendation section entitled "Effective interventions":

"The recommendations mainly cover interventions to help pregnant women who smoke to quit. These are listed at the beginning of recommendations 4 and 5. Interventions for partners are covered in recommendation 7. Interventions that are effective with the general population are described in: 'Brief interventions and referral for smoking cessation' (NICE public health guidance 1), 'Workplace interventions to promote smoking cessation' (NICE public health guidance 5) and 'Smoking cessation services' (NICE public health guidance 10). No specific recommendations have been made for those planning a pregnancy or who have recently given birth. This is due to the lack of evidence available on stop-smoking interventions for these groups. It does not constitute a judgement on whether or not such interventions are effective or cost effective."

The main evidence review informing this guidance was "a systematic review of how to stop smoking in pregnancy and following childbirth" which assessed three main topics through sub-reviews:

- Review 1: 'Which interventions are effective and cost effective in encouraging the establishment of smokefree homes?'
- Review 2: 'Factors aiding delivery of effective interventions'
- Review 3: 'The health consequences of pregnant women cutting down as opposed to quitting'.

The three expert reports are:

- Expert report 1: 'The effectiveness of smoking cessation interventions during pregnancy: a briefing paper'
- Expert report 2: 'Interventions to improve partner support and partner cessation during pregnancy'
- Expert report 3: 'Rapid review of interventions to prevent relapse in pregnant ex-smokers'.

This public health guidance document and underlying evidence review contributed to evidence statements 7 in Review 1.

Relevant recommendation (1, 2, 4, 5)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R1: advise for midwives at first maternity booking and subsequent appointments (subset of bullets) … • Provide information (for example, a leaflet) about the risks to the unborn child of smoking when pregnant and the hazards of exposure to secondhand smoke for both mother and baby. Information should be available in a variety of formats. • Explain about the health benefits of stopping for the woman and her baby. Advise her to stop – not just cut down. • Explain that it is normal practice to refer all women who smoke for help to quit and that a specialist midwife or adviser will phone and offer her support … • Refer all women who smoke, or have stopped smoking within the last 2 weeks, to NHS Stop Smoking Services … • Use local arrangements to make the appointment and, in case they want to talk to someone over the phone in the meantime, give the NHS Pregnancy Smoking Helpline	**R2.1 - Not applicable** - does not address effectiveness of providing information about risks or explaining health benefits of stopping.	Not applicable	Not applicable
	R2.2 Evidence statement 2. Five qualitative studies and three surveys provide evidence that the information and advice provided by health professionals can be perceived as insufficient or inadequate by some women and by professionals themselves. There is the suggestion that advice could be more detailed and explicit, and that professionals find discussion of individual smoking behaviours challenging.	Anderson et al. 2002 (USA service users) Qualitative - Everett et al. 2005 (South Africa service providers) Qualitative+, Arborelius and Nyberg 1997 (Sweden service users) Qualitative+, McCurry et al. 2002 (N Ireland service users) Qualitative+, Nichter et al. 2007 USA service users) Qualitative+ Qualitative studies not included in evidence tables so no additional coding possible from them.	Intervention Function 1 Education- provide information BCT78 Information about health consequences
	R2.3-11 - Not applicable - does not address effectiveness of providing information about risks or explaining health benefits of stopping.	Not applicable	Not applicable
	Evidence statement ER1.6 There is evidence from four UK studies that NHS stop smoking services are effective in supporting pregnant women to stop smoking.	Bryce et al. 2007 (UK) + mixed methods (behavioural support using motivational interviewing by specialist smoking cessation midwives. NRT was also provided)	BCT3 Social support (unspecified) BCT4 Pharmacological support

Relevant recommendation (1, 2, 4, 5)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
number: 0800 1699 169. Also provide the local helpline number where one is available. • If her partner or others in the household smoke, suggest they contact NHS Stop Smoking Services. If no one smokes, give positive feedback. **Evidence statements** R2.1, R2.2, R2.3, R2.4, R2.5, R2.6, R2.7, R2.8, R2.9, R2.10, R2.11, ER1.6, ER1.10, ER1.11; IDE	The NHS stop smoking service interventions for pregnant women described in these articles consist of a combination of behavioural support (delivered in a range of settings and formats) and NRT (for most but not all women).	McGowan et al. 2008 (UK) + mixed methods (behavioural support using motivational interviewing and were offered NRT. Subsequent behavioural support was delivered by telephone) Macaskill et al. 2008 (UK) + mixed methods (descriptive study, no evidence of effectiveness) Lee et al. 2006 (UK) + qualitative (interviews with professionals about best practice)	
	Evidence statement ER1.10 There is good evidence that women in the UK underreport smoking during pregnancy and that CO monitoring can aid in the identification of pregnant smokers. Two studies found that around one in four pregnant women in the west of Scotland do not accurately disclose their smoking status when asked during the booking visit with a midwife. One of these studies described how routine CO monitoring in ante-natal clinics, if implemented consistently, can improve the accurate identification of pregnant smokers and facilitate referral to smoking cessation services.	Shipton et al. in press (UK) ++ cross sectional Usmani et al. 2008 (UK) + cross sectional	Not applicable – CO monitoring for the identification of smokers rather than part of a behaviour change intervention.
	ER1.11 There is very preliminary evidence from two observational studies that opt-out referral pathways can increase the number of women who engage with NHS stop smoking services and result in larger numbers of women quitting smoking, when compared with opt-in referral pathways.	Macaskill et al. 2008 (UK) + mixed methods McGowan et al. 2008 (UK) + mixed methods	Not applicable – service level, not individual level.
R2: • Those with specialist training should provide pregnant women who smoke with information (for example, a leaflet) about the risks to the unborn child of smoking when pregnant. They should also provide information on the hazards of exposure to secondhand smoke for both mother and baby and on the benefits of stopping smoking. Information should be available in a variety of formats. **Evidence statements** R2.1, R2.2, R2.3, R2.4, R2.5, R2.6, R2.7, R2.8, R2.9, R2.11, ER1.6, ER1.10; IDE	Same evidence statements as above. All not relevant to the extracted recommendation paragraph except R2.2 which supplies indirect evidence that information should be provided (see R2.2 above).	See R2.2 above.	Intervention Function 1 Education BCT78 Information about health consequences
R4 Context Studies have shown that the following interventions are effective in helping women who are pregnant to quit smoking: • cognitive behaviour therapy • motivational interviewing • structured self-help and support from NHS Stop Smoking Service	**Evidence statements R2.1-11** are covered above. All not relevant except R2.2 which supplies indirect evidence that information should be provided (see R2.2 above). **ER1.6** covered above. This is relevant to the effectiveness of behavioural support and NRT (see	See R2.2 above. See ER1.6 above	**R2.2** Intervention Function 1 Education BCT78 Information about health consequences **R1.6** BCT3 Social support (unspecified) BCT4 Pharmacological support

Relevant recommendation (1, 2, 4, 5)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
In addition, in other countries the provision of incentives to quit has been shown to be effective with this group (research is required to see whether it would work in the UK). [mirrors conclusions of Cochrane Review, Lumley 2009 although no source is referenced in full guidance document] **R4** is for NHS Stop Smoking Specialist advisers: • During the first face-to-face meeting, discuss how many cigarettes the woman smokes and how frequently. Ask if anyone else in the household smokes (this includes her partner if she has one). • Provide information about the risks of smoking to an unborn child and the benefits of stopping for both mother and baby. • Address any concerns she and her partner or family may have about stopping smoking and offer personalised information, advice and support on how to stop[1]. (1 This is an edited extract from a recommendation that appears in 'Smoking cessation services' NICE public health guidance 10. It does not constitute a change to the original recommendation.) • Provide the woman with intensive and ongoing support (brief interventions alone are unlikely to be sufficient) throughout pregnancy and beyond. This includes regularly monitoring her smoking status using CO tests. The latter may encourage her to try to quit – and can also be a useful way of providing positive feedback once a quit attempt has been made. • Biochemically validate that the woman has quit on the date she set and 4weeks after. Where possible, use urine or saliva cotinine tests, as these are more accurate than CO tests and can detect exposure over the past few days rather than hours. When carrying out these tests, check whether the woman is using nicotine replacement therapy (NRT) as this may raise her cotinine levels. Note: no measure can be 100% accurate. Some people may smoke so infrequently – or inhale so little – that their intakes cannot reliably be distinguished from that due to passive smoking. **Evidence statements** R2.1, R2.2, R2.3, R2.4, R2.5, R2.6, R2.7, R2.8, R2.9, R2.10, R2.11, R2.12, ER1.1, ER1.2, ER1.5, ER1.6,ER1.8, ER1.12; IDE	ER1.6 above)		
	Evidence statement 2.12. One qualitative study and two narrative reports describe obstacles to pregnant women smokers accessing services as including: the length of sessions; difficulty making telephone contact; and a lack of transport or child care. It is suggested that domiciliary or very local services, the provision of crèche facilities, appointment systems or telephone counselling could be suitable service delivery options.	Tod 2003 (GB service users) Qualitative+ Narrative - Katz et al. 2008 (USA service users), Solomon and Flynn 2005 (USA service users).	Not applicable – not directly addressing intervention effectiveness on an individual level; about service organisation.
	Evidence statement ER1.1 There is good evidence from one recently updated systematic review on the effectiveness of interventions for promoting smoking cessation in pregnancy. The 2009 Cochrane review included 72 trials. Pooled results show that cessation interventions reduce smoking in late pregnancy [RR 0.94, 95% CI 0.93 to 0.96] and reduce incidences of low birth weight [RR 0.83, 95% CI 0.73 to 0.95] and pre-term births [RR 0.86, 95% CI 0.74 to 0.98] while increasing birth weight by a mean of 53.91g [95% CI 10.44g to 95.38g] . The overall finding of the updated review is that smoking cessation interventions used in early pregnancy can reduce smoking in later pregnancy by around 6% (or 3% using studies least prone to bias). **Review plain language summary: …** "The interventions offered to promote smoking cessation in pregnancy are generally given individually and include cognitive behaviour and motivational interviewing; offering incentives; interventions based on stages of change; giving feedback to the mothers on foetal health status or nicotine by-products measurements; nicotine replacement therapy, bupropion or other medications." …	Lumley et al. 2009 (International) Review ++ Lumley J, Chamberlain C, Dowswell T, Oliver S, Oakley L, Watson L. (2009) Interventions for promoting smoking cessation during pregnancy.[update of Cochrane Database Syst Rev, 4):CD001055; PMID: 15495004]. [Review] [301 refs]. Cochrane Database of Systematic Reviews, (3):CD001055. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001055.pub3/pdf	From Lumley plain language summary: • cognitive behaviour and motivational interviewing (BCT3 Social support (unspecified)) • offering incentives (BCT60 Incentive) • interventions based on stages of change (No code) • giving feedback to the mothers on foetal health status or nicotine by-products measurements (BCT14 Biofeedback) • nicotine replacement therapy, bupropion or other medications (BCT4 Pharmacological support)

Relevant recommendation (1, 2, 4, 5)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	Evidence statement ER1.5 There is good evidence from one recent systematic review on the effectiveness of self-help interventions for smoking cessation in pregnancy, although the extent of UK evidence is limited. Fifteen trials were included in the review and 12 in the primary meta-analysis which found that self-help interventions were effective [OR 1.83, 95% CI 1.23 to2.73]. A further meta-analysis failed to find evidence that more intensive self-help interventions had greater impact than less intensive ones.	Naughton et al. (2008) Review ++	No behaviour change coding possible.
	Evidence statement ER1.8 There is limited evidence about whether the form of delivery can affect the effectiveness of smoking cessation interventions for pregnant women.	Aveyard et al. 2008 (UK) ++ RCT Lee et al. 2006 (UK) + qualitative	Not applicable – form of delivery
	Evidence statement ER1.12 There is some evidence about the barriers to accessing stop smoking support by pregnant women in the UK. Two studies explored pregnant women's views about smoking cessation services. Barriers to accessing services included, among others, feeing unable to quit, lack of knowledge about services, difficulty of accessing services, fear of failing and concerns about being stigmatized.	Ussher et al. 2006 (UK) + cross sectional Taylor et al. 2008 (UK) – qualitative	Not applicable – barriers to access
R5 Use of NRT and other pharmacological support **Context** There is mixed evidence on the effectiveness of NRT in helping women to stop smoking during pregnancy. The most robust trial to date has found no evidence that it is effective (or that it affects the child's birthweight). In addition, there are insufficient data to form a judgement about whether or not NRT has any impact on the likelihood that a child will need special care or will be stillborn. **Evidence statements** ER1.3, ER1.4; IDE	**Evidence statement ER1.3** There is mixed evidence from one recently updated systematic review and one recent trial (not included in the review) on the effectiveness of nicotine replacement therapy (NRT) for promoting smoking cessation in pregnancy In the review, meta-analysis of data from five trials found NRT to be effective [RR 0.95 CI 0.92 to 0.98]. However, a large double blind placebo controlled trial was published after the review searches were completed that found no evidence that NRT was effective for smoking cessation in pregnancy [RR 0.96, 95% CI 0.85 to 1.09].	Lumley et al. 2009 (International) Review ++ Oncken et al. 2008 (USA) RCT ++	BCT 4 Pharmacological Support

Relevant recommendation (1, 2, 4, 5)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	Evidence statement ER1.4 There is no evidence that NRT either increases or decreases low birthweight. There are insufficient data to form judgements about any impact of NRT on stillbirth or special care admissions	Lumley et al. 2009 (International) Review ++ Oncken et al. 2008 (USA) RCT ++	BCT 4 Pharmacological Support

PH27 Weight management before, during and after pregnancy (2010)

This guidance contains a small section on changing behaviour that outlines behaviour principles. This section is cited in the NICE document as being an edited extract from a recommendation that appears in “Behaviour change”. NICE public health guidance 6.

PH27 guidance states that “Evidence-based behaviour change advice includes:

- understanding the short, medium and longer-term consequences of women's health-related behaviour
- helping women to feel positive about the benefits of health-enhancing behaviours and changing their behaviours
- recognising how women's social contexts and relationships may affect their behaviour
- helping plan women's changes in terms of easy steps over time
- identifying and planning situations that might undermine the changes women are trying to make and plan explicit 'if–then' coping strategies to prevent relapse”

Two evidence reviews of effectiveness:

1. Systematic review of dietary and/or physical activity interventions for weight management in pregnancy
2. Systematic review of weight management interventions after childbirth

This public health guidance document and underlying evidence review contributed to evidence statements 7 and 9 in Review 1.

Relevant recommendation (1,2,4)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R1 aimed at women with a BMI of 30 or more who may become pregnant, including those who have previously been pregnant. Only the relevant subset of the full bullet risk is included below: ... • Health professionals should use any opportunity, as appropriate, to provide women with a BMI of 30 or more with information about the health benefits of losing weight before becoming pregnant (for themselves and the baby they may conceive). This should include information on the increased health risks their weight poses to themselves and would pose to their unborn child. • GPs, dieticians and other appropriately trained health professionals should advise, encourage and help women with a BMI of 30 or more to reduce weight before becoming pregnant. They should explain that losing 5–10% of their weight (a realistic target) would have significant health benefits and could increase their chances of becoming pregnant. Further weight loss, to achieve a BMI within the healthy range (between 24.9 and 18.5 kg/m^2) should also be encouraged, using evidence-based behaviour change techniques. Losing weight to within this range may be difficult and women will need to be motivated and supported.	**1.19** Evidence from 3 UK based qualitative studies (Gross and Bee/ Clarke and Gross 2004, [++]), (Heslehurst et al., 2007b [++]), (Wiles 1998 [++]) suggests that weight management information and advice from professionals is not received or assimilated by many women during pregnancy. Available information is often vague, confusing, contradictory, and is not linked to weight management. Overweight women may feel they are not receiving relevant, tailored information about appropriate diet and weight gain during pregnancy (Wiles 1998, [+]).	Gross and Bee/ Clarke and Gross 2004,[++] Heslehurst et al., 2007b [++] Wiles 1998 [++]	Indirect evidence for better advice and information. Intervention Function 1 Education
	1.20 There is evidence from UK based qualitative research (Levy 1999, [+]; Heslehurst et al., 2007b [++]) that women may be unaware of the potential effects of obesity during pregnancy (Heslehurst et al., 2007b [++]) However, they may avoid information about their health if they find it distressing and will only action it when they feel the time is right for the well-being of themselves, their unborn baby and their partners (Levy 1999 [+]).	Levy 1999, [+] Heslehurst et al., 2007b [++]	Indirect evidence to provide information about health consequences (BCT78 Information about Health Consequences and Intervention Function 1 Education)

Relevant recommendation (1,2,4)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
Health professionals should encourage women to check their weight and waist measurement periodically or, as a simple alternative, check the fit of their clothes. Health professionals should offer a weight-loss support programme involving diet and physical activity. The programme should follow the principles of good practice, as outlined at the beginning of this section. ... **Evidence statements 1.19, 1.20, 1.21, 1.22; IDE**	**1.21 -**There is evidence from UK based qualitative research (Heslehurst et al., 2007b, [++]) that health professionals working in maternity units may feel they have insufficient time to discuss weight issues with women during pregnancy and consider that it is too late to give advice on weight management once a woman is pregnant. Health professionals themselves report that women's access to the information and advice on weight management is often ad hoc.	Heslehurst et al., 2007b, [++] (Qualitative interviews of healthcare professionals)	No behaviour change coding possible.
	1.22 – Not applicable to recommendation subset - Evidence from two UK based qualitative studies (Gross and Bee / Clarke and Gross 2004 [++], and Fox and Yamaguchi 1997 [+]) suggests that even relatively active women reduce their physical activity during pregnancy (although they are more likely to continue to be active at some level). One study (Gross and Bee /Clarke and Gross 2004, [++]) found that pregnant women decreased their activity levels based on advice from health professionals, or more commonly, on information they had read in books and magazines. Family members, friends, and even health trainers tended to discourage physical activity. Women balanced their fears of injury to themselves or harm to the baby with aims toward weight management. Women also reported reduced motivation, physical limitations due to larger size and tiredness during pregnancy and a lack of facilities. Another study reported that pregnant women may feel self-conscious when carrying out physical activity (Fox and Yamaguchi 1997, [+]).	Gross and Bee / Clarke and Gross 2004 [++] (Qualitative interviews) Fox and Yamaguchi 1997 [+] (Qualitative free response questionnaires)	No behaviour change coding possible.
R2 aimed at all pregnant women but, in particular, those with a BMI of 30 or more. • At the earliest opportunity, for example, during a pregnant woman's first visit to a health professional, discuss her eating habits and how physically active she is. Find out if she has any concerns about diet and the amount of physical activity she does and try to address them. • Advise that a healthy diet and being physically active will benefit both the woman and her unborn child during pregnancy and will also help her to achieve a healthy weight after giving birth. Advise her to seek information and advice on diet and activity from a reputable source. • Offer practical and tailored information. This includes advice on how to use Healthy Start vouchers to increase the fruit and vegetable intake[6] of those eligible for the Healthy Start scheme (women under 18 years and those who are receiving benefit payments).	**See above:** **1.20 -** effects of obesity during pregnancy **1.21** – some consider that it is too late to give advice on weight management once a woman is pregnant	See above.	Inference derived from the evidence that info about health benefits may be beneficial (Intervention Function 1 Education BCT78 Information about health consequences)
	1.1 There is weak evidence from one Australian based case series that obese women trying to become pregnant but experiencing infertility can achieve a statistically significant reduction in BMI through a programme that includes regular physical activity, advice about healthy eating and group support.	Galletly et al., 1996 (non-experimental descriptive study (not quality graded), group programme had an hour of exercise, coping strategies, group support (support for what was not specified, intervention also dealt with psychological impact of infertility and so not clear whether the support was related to the target behaviour)	BCT23 Behavioural practice/rehearsal BCT61 Problem Solving

Relevant recommendation (1,2,4)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
• Dispel any myths about what and how much to eat during pregnancy. For example, advise that there is no need to 'eat for two' or to drink full-fat milk. Explain that energy needs do not change in the first 6 months of pregnancy and increase only slightly in the last 3 months (and then only by around 200 calories per day). • Advise that moderate-intensity physical activity will not harm her or her unborn child. At least 30 minutes per day of moderate intensity activity is recommended. • Give specific and practical advice about being physically active during pregnancy ... • Explain to women with a BMI of 30 or more at the booking appointment how this poses a risk, both to their health and the health of the unborn child. Explain that they should not try to reduce this risk by dieting while pregnant and that the risk will be managed by the health professionals caring for them during their pregnancy. • Offer women with a BMI of 30 or more at the booking appointment a referral to a dietitian or appropriately trained health professional for assessment and personalised advice on healthy eating and how to be physically active. Encourage them to lose weight after pregnancy[6]. **Evidence statements 1.1, 1.18, 1.20, 1.21, 1.26; IDE**	**1.18** No UK based qualitative evidence was identified on the views, perceptions and beliefs of health professionals, women actively planning a pregnancy and their partners and families about diet, physical activity and weight management prior to pregnancy. However, there is UK based qualitative evidence to suggest that women's eating habits during pregnancy are related to pre-pregnancy dietary attitudes and behaviour. Weight and body shape concerns are affected by size prior to pregnancy (Fox and Yamaguchi 1997 [+]) Women's dietary restraint may be continued or relaxed during pregnancy (Warriner 2000 [+]).	Fox and Yamaguchi 1997 [+] Warriner 2000 [+].	Not applicable
	1.26 Qualitative evidence from two UK based studies (Heslehurst et al., 2007b, [++], Warriner 2000, [+] suggest there are communication difficulties between overweight women and health professionals. One study of health professionals found that they are often embarrassed to discuss issues of weight with overweight women, and that the women themselves were also embarrassed (Heslehurst et al., 2007b, [++]). Such experiences may not be fixed, but may change over the course of a pregnancy. One study (Heslehurst et al., 2007b, [++]) explored the views of health professionals, some of which found it difficult to raise this issue sensitively. They reported a lack of guidance on this issue, though were aware of the risks and benefit so raising the issue. They were concerned that some women may stop attending antenatal appointments if they felt victimised.	Heslehurst et al., 2007b, [++] Warriner 2000, [+]	Inference derived from the evidence for providing information or advice (Intervention Function 1 Education)
R4 Recommendation 4 Women with a BMI of 30 or more after childbirth. • Explain the increased risks that being obese poses to them and, if they become pregnant again, their unborn child. Encourage them to lose weight. • Offer a structured weight-loss programme. If more appropriate, offer a referral to a dietitian or an appropriately trained health professional. They will provide a personalised assessment, advice about diet and physical activity and advice on behaviour change strategies such as goal setting. Women who are not yet ready to lose weight should be provided with information about where they can get support when they are ready. • Use evidence-based behaviour change techniques to motivate and support women to lose weight. • Encourage breastfeeding and advise women that losing weight by eating healthily and taking regular exercise will not affect the quantity or quality of their milk[6]. ([6] This is an edited extract from a recommendation that appears in 'Maternal and child nutrition'. NICE public health guidance 11.) **Evidence statements 2.1, 2.3, 2.6, 2.12, 2.13; IDE**	**2.1** There is limited evidence from one US based RCT (McCrory et al., 1999 [+]) that dietary intervention alone (aiming for 35% energy deficit) from 12 weeks postpartum may help women across the BMI spectrum start to lose more weight after childbirth compared to usual care. However, the short length of this intervention (11 days) makes it difficult to draw conclusions on the effectiveness of the study. Four day weighed food records suggested that calorie intake was not lower in the intervention compared to the control arm of the trial. The setting of this study (US) makes it somewhat relevant to the UK.	McCrory et al., 1999 [+] (diet+ exercise vs. diet only, diet intervention was tailored food provision in preweighed amounts. Exercise - target heart rate - but self-directed) Leermakers et al. 1998 [+] (two group session, correspondence materials, telephone contact) Group instruction in self-monitoring, followed low cal diet, graded physical activity progression. Self-monitored calories, fat and PA, group session 2 discussion about progress and problem solving, written lessons about nutrition, exercise and behaviour change strategies, phone calls during intervention period discussing progress, goal setting, problem solving. Behavioural lessons, which focused on strategies to modify diet and exercise behaviours Lovelady et al., 2006 [+]; (low cal eating plan,	**McCrory et al., 1999** No behaviour change coding possible.
	2.3 Four out of 5 US based RCTs addressing diet and physical activity postpartum found a significant reduction in total weight among women across the BMI spectrum in the intervention group compared to control (Leermakers et al. 1998 [+]; Lovelady et al., 2006 [+]; McCrory et al., 1999 [+]; O'Toole et al., 2003 [-]). Only one US based RCT found that total weight was not significantly lower in the intervention group compared to control (Dewey et al. 1994 [+]). Results did not appear to vary based on the start dates of intervention or the length of follow up.		**Leermakers et al. 1998** BCT10 Self-monitoring of behaviour BCT29 Graded tasks BCT11 Self-monitoring of outcomes BCT61 Problem solving BCT36 Instructions on how to perform a behaviour BCT62 Goal setting (behaviour) BCT63 Goal setting (outcome)

Relevant recommendation (1,2,4)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
		instructed by grad assistants to meet food pyramid recommendations, behaviour strategies and problem solving discussed at individual weekly session. Six low fat low cal meals given to assist compliance. PA compliance monitoring, weighed by researcher. O'Toole et al., 2003 [-]). Structured vs. Self-directed program. Structured = specific Individualised diet and exercise program, diet and PA diaries, cooking demonstrations, nutritional education and motivation. Group educational sessions, calorie intake and expenditure through PA goals set. Self-directed (education session, goals, recommended levels. Dewey et al. 1994 [+]).(exercise sessions with target heart rates to be achieved, graded task of increasing intensity up to goal of 45 mins at target heart rate, self-monitoring of diet, heart monitoring.	BCT23 Behavioural practice/rehearsal BCT84 Demonstration of the behaviour **Lovelady et al., 2006.** Not specific enough for BCT coding but fit under BCT Cluster 11 "Goals and Planning" **O'Toole et al., 2003** BCT64 Action planning BCT11 Self-monitoring of outcome BCT62 Goal setting (behaviour) BCT84 Demonstration of the behaviour **Dewey et al. 1994** BCT29 Graded tasks BCT63 Goal setting (outcome) BCT10 Self-monitoring of behaviour BCT11 Self-monitoring of outcomes
	2.6 In line with their results for weight loss, three RCTs from the USA found that intervention focusing on diet and exercise resulted in decreased calorie intake (Leermakers et al. 1998 [+]; Lovelady et al., 2006 [+]; O'Toole et al., 2003 [-]) and decreased consumption of unhealthy foods (Lovelady et al., 2006 [+]). Of these studies, one also found significant increase in energy expenditure between exercise groups (O'Toole et al., 2003 [-]) whereas another (Leermakers et al. 1998 [+]) found no significant difference in total energy expenditure between groups. Lovelady et al., 2006 [+]) did not report results for physical activity.		See coding above for Leermakers et al. 1998; Lovelady et al., 2006; O'Toole et al., 2003 coding above.
	2.12 The evidence suggests weight management interventions addressing diet and physical activity had little or no adverse effects on breastfeeding outcomes, including milk volume, infant intake and weight, time and frequency feeding (Dewey et al. 1994 [+]; McCrory et al., 1999 [+]). Milk protein was observed to decrease in one short US based trial (McCrory et al., 1999 [+]). Overweight women had higher milk energy outputs, and leaner women saw a decrease in milk energy output (McCrory et al. 1999).		See coding above for Dewey et al. 1994 [+]; McCrory et al., 1999 [+]
	2.13 The one high quality trial which examined correlations between monitoring and weight loss (Leermakers et al. 1998 [+])found that there was a significant correlation between number of self-monitoring records returned and weight loss ($r=0.50$, $P<0.005$). However, homework completion or telephone contact with research staff was not significantly correlated with		See coding above for Leermakers et al. 1998

Relevant recommendation (1,2,4)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	weight loss. Women enrolled in this trial had an above average BMI bordering on obese classification at start of the intervention. None of the included studies considered the effectiveness of monitoring alone.		

PH38 Preventing type 2 diabetes - risk identification and interventions for individuals at high risk (2012)

The recommendations focus on two major activities:

- Identifying people at risk of developing type 2 diabetes using a staged (or stepped) approach. This involves a validated risk-assessment score and a blood test – either the fasting blood glucose or the HbA_{1c} test to confirm high risk.
- Providing those at high risk with a quality-assured, evidence-based, intensive lifestyle-change programme to prevent or delay the onset of type 2 diabetes.

Relevant recommendations relating to the second activity have been extracted below. The recommendations aim to help adults who are at high risk of developing type 2 diabetes. When a particular at-risk group is being targeted, this is cited in the recommendation.

Four evidence reviews informed this guidance. The four reviews are:

- Review 1: 'Preventing the progression of pre-diabetes to type 2 diabetes in adults. Identification and risk assessment of adults with pre-diabetes'
- Review 2: 'Prevention of type 2 diabetes: systematic review and meta-analysis of lifestyle, pharmacological and surgical interventions'
- Review 3: 'Prevention of type 2 diabetes: reviewing mechanisms of successful interventions and translation of major trial evidence to practice'
- Review 4: Prevention of type 2 diabetes: views, barriers and facilitators that may affect the implementation and effectiveness of interventions'

Expert papers:

- Expert Paper 1: NHS Health Check programme - Heather White
- Expert Paper 2: implementing diabetes prevention programmes - Jaakko Tuomilehto
- Expert Paper 3: community-based diabetes prevention - Melanie Davies
- Expert Paper 4: community-based diabetes prevention-PREPARE - Tom Yates
- Expert Paper 5: translation of trial evidence into practice across Europe - Peter Schwarz
- Expert Paper 6: preventing the progression from type 2 pre-diabetes – Simon Griffin
- Expert Paper 7: translating established science to sustainable national programs - Ann Albright
- Expert Paper 8: supporting lifestyle change for adults at risk - Colin Greaves

Key evidence:
Expert Paper 8: Supporting change in diet and physical activity behaviour for adults at risk of type 2 diabetes: A systematic review of reviews Colin Greaves, Kate Sheppard, Charles Abraham, Wendy Hardeman, Michael Roden, IMAGE Study Group, Peter Schwarz.

Key definitions used in the guidance.

DPP/DPS
US based Diabetes Prevention Program (DPP) or the Finnish based Diabetes Prevention Study (DPS) protocols.

Brief advice
Typically, for diabetes prevention, brief advice might consist of a 5–15 minute consultation. The aim is to help someone make an informed choice about whether to make lifestyle changes to reduce their risk of diabetes. The discussion covers what that might involve and why it would be beneficial. Practitioners may provide written information in a range of formats and languages about the benefits and, if the person is interested in making changes, may discuss how these can be achieved and sustained in the long term.

Brief interventions
“Brief interventions for diabetes prevention can be delivered by GPs, nurses, healthcare assistants and professionals in primary healthcare and the community. They may be delivered in groups or on a one-to-one basis. They aim to improve someone's diet and help them to be more physically active. A patient-centred or 'shared decision-making' communication style is adopted to encourage people to make choices and have a sense of 'ownership' of their lifestyle goals and individual action plans Providers of brief interventions should be trained in the use of evidence-based behaviour-change techniques for supporting weight loss through lifestyle change.”

This public health guidance document and underlying evidence review contributed to evidence statement 8, 10, 11, 12 and 14 in Review 1.

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
R5 for people at low risk (that is, those who have a low or intermediate risk score), tell the person that they are currently at low risk, which does not mean they are not at risk – or that their risk will not increase in the future. Offer them brief advice. As part of brief advice: • Discuss their risk factors and how they could improve their lifestyle to reduce overall risk. • Offer encouragement and reassurance. • Offer verbal and written information about culturally appropriate local services and facilities that could help them change their lifestyle. Examples could include information or support to: improve their diet (including details of any local markets offering cheap fruit and vegetables); increase their physical activity and reduce the amount of time spent being sedentary (including details about walking or other local physical activity groups and low-cost recreation facilities). The information should be provided in a range of formats and languages For people with a moderate risk (a high risk score, but with a fasting plasma glucose less than 5.5 mmol/l or HbA_{1c} of less than 42 mmol/mol [6.0%]): • Tell the person that they are currently at moderate risk, and their risks could increase in the future. Explain that it is possible to reduce the risk. Briefly discuss their particular risk factors, identify which ones can be modified and discuss how they can achieve this by changing their lifestyle. • Offer them a brief intervention to help them change their lifestyle: give information about services that use evidence-based behaviour-change techniques that could help them change, bearing in mind their risk profile. Services cited could include walking programmes, slimming clubs or structured weight-loss programmes. (See recommendations 11–14.) • Discuss whether they would like to join a structured weight-loss programme. Explain that this would involve an individual assessment and tailored advice about diet, physical activity and behaviour change. Let them know which local programmes offer this support – and where to find them. For people confirmed as being at high risk (a high risk score and fasting	**Evidence statement 2.1 Lifestyle interventions** A meta-analysis of hazard ratios (HR) shows that lifestyle interventions (pooled HR 0.51, 95% CI 0.43–0.62) can reduce the progress to diabetes for people with IGT (impaired glucose tolerance). Each type of lifestyle intervention, whether diet (HR 0.67, 95% CI 0.49–0.92), exercise (0.53 95% CI 0.34–0.83), or a combination of diet and exercise (HR 0.47 95% CI 0.37–0.59) had a beneficial effect, although a combination of diet and exercise appeared to have more effect than either diet or exercise alone. The HR for diet-only interventions was based on three studies, one (+) UK[1], one (++) Chinese[2] and one (-) Australian[3]. The hazard ratio for exercise-only intervention was based on one (++) Chinese study[2]. The hazard ratio for the diet combined with exercise intervention was based on nine studies, one study in each of the following countries, UK[4] (++), Japan[5] (++), China[6] (-), India[7] (++), Netherlands[8] (++), Finland[9] (++), Sweden[10] (++) and two US studies, (one [++][11] and one [+][12]).	Included in the meta-analysis, see Table 3 of Evidence Review 2 for intervention details: 1Jarrett et al. 1979 2 Pan et al. 1997 3Wein et al. 1999 4 Penn et al. 2009 5 Kosaka et al. 2005 6 Li et al. 2008 7 Ramachandran et al. 2006 (Lifestyle modification +/- drug) 8 Roumen et al. 2008. 9 Lindstrom et al. 2006. 10 Lindahl et al. 2009 11 Diabetes Prevention Program Research Group 2009 (lifestyle vs. drug vs. placebo) 12 Liao et al. 2002	[1]Jarrett et al. 1979 (Intervention Function 1 Education, BCT4 Pharmacological support) [2] Pan et al. 1997 (Intervention Function 1 Education, BCT29 Graded tasks) [3]Wein et al. 1999 (BCT3 Social support (unspecified)) [4] Penn et al. 2009 (no code) [5] Kosaka et al. 2005 (Intervention Function 1 Education) [6] Li et al. 2008 (no code) [7] Ramachandran et al. 2006 (Lifestyle modification +/- drug BCT4 Pharmacological support) [8] Roumen et al. 2008.(Intervention Function 1 Education) [9] Lindstrom et al. 2006.(BCT63 Goal setting (outcome), counselling Intervention Function 1 Education, Intervention Function 2 Persuasion) [10] Lindahl et al. 2009 (BCT23 Behavioural practice/rehearsal) [11] Diabetes Prevention Program Research Group 2009 (lifestyle vs. drug vs. placebo BCT4 Pharmacological support) [12] Liao et al. 2002 (Training and dietary prescription Intervention Function 5 Training)
	2.5 South Asian populations For populations comprising of south Asian individuals (Asian Indian, Chinese, Japanese and Japanese Americans), both a diet combined with exercise intervention and oral diabetes drug interventions have an effect on the progression from IGT (impaired glucose tolerance) to diabetes. The diet and exercise lifestyle intervention seems to have more effect on the progression from IGT (impaired glucose tolerance) to diabetes (overall pooled effect of 0.58, 95% CI 0.47–0.73), than pharmacological interventions (overall pooled effect of 0.72, 95% CI 0.52–0.99). The hazard ratio for diet combined with exercise intervention was based on five studies in the following countries: US[1] (+), Japan[2] (++), India[3] (++) and China (one [++][4]; and one[-][5]). For oral diabetes drugs, the hazard ratio was based on four studies in the following countries: Japan[6] (++), India[7] (++) and China[8, 9] (both [++]).	1 Liao et al. 2002 2 Kosaka et al. 2005 3 Ramachandran et al. 2006 4 Li et al. 1997 5 Li et al. 2008 6 Kawamori et al. 2009 7 Ramachandran et al. 2009 8 Li et al. 1999 9 Pan et al. 2003	[1] Liao et al. 2002. (Intervention Function 5 Training) [2] Kosaka et al. 2005. (Intervention Function 1 Education) [3] Ramachandran et al. 2006. (advice +/- drug Intervention Function 1 Education +/- BCT4 Pharmacological support) [4] Li et al. 1997.(not in evidence table) [5] Li et al. 2008. (No behaviour change coding possible) [6] Kawamori et al. 2009 (BCT4 Pharmacological support) [7] Ramachandran et al. 2009 (Lifestyle modification +/- drug BCT4 Pharmacological support) [8] Li et al. 1999 (BCT4 Pharmacological support) [9] Pan et al. 2003 (BCT4 Pharmacological support)

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
plasma glucose of 5.5–6.9 mmol/l or HbA_{1c} of 42–47 mmol/mol [6.0–6.4%]): • Tell the person they are currently at high risk but that this does not necessarily mean they will progress to type 2 diabetes. Explain that the risk can be reduced. Briefly discuss their particular risk factors, identify which ones can be modified and discuss how they can achieve this by changing their lifestyle. • Offer them a referral to a local, evidence-based, quality-assured intensive lifestyle-change programme(see recommendations 8, 9 and 10). In addition, give them details of where to obtain independent advice from health professionals. For people with possible type 2 diabetes(fasting plasma glucose of, 7.0 mmol/l or above, or HbA_{1c} of 48 mmol/mol [6.5%] or above, but no symptoms of type 2 diabetes): • Carry out a second blood test. If type 2 diabetes is confirmed, treat this in accordance with NICE guidance on type 2 diabetes. Ensure blood testing conforms to national quality specifications. • If type 2 diabetes is not confirmed, offer them a referral to a local, quality-assured, intensive lifestyle-change programme (see recommendations 8, 9 and 10). **Evidence statements** 2.1, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 4.5, 4.9, 4.10, 4.11, 4.12, 4.13, 4.15, 4.16, 4.17; Additional evidence: expert paper 2, expert paper 7 **R6 Reassessing Risk** … • At least once a year, review the lifestyle changes people at high risk have made. Use the review to help reinforce their dietary and physical activity goals, as well as checking their risk factors. The review could also provide an opportunity to help people 'restart', if lifestyle changes have not been maintained. **Evidence statements 4.4, 4.17, 4.18; Additional evidence: cost-effectiveness review**	**Evidence statement 2.6 Reduction in BMI** In the short term (2 to 5 years), both lifestyle intervention and pharmacological interventions, showed a greater reduction in BMI than control groups. Lifestyle interventions (range -1.3 to +0.8) had a smaller range effect on BMI than pharmacological interventions (range -1.6 to +1.4). The changes in BMI in the diet intervention are based on one Australian study (-)[1] and the diet combined with lifestyle interventions are based on four studies: US[2] (+), Finland[3] (++), Netherlands[4] (++) and Sweden[5] (++). The changes in BMI in pharmacological studies are based on four studies: China[6] (++), India[7] (++), US[8] (+) and Finland[9] (++).	1 Wein et al. 1999 2 Liao et al. 2002 3 Lindstrom et al. 2003 (DPS Study) 4 Roumen et al. 2008 5 Lindahl et al. 2009 6 Li et al. 1999 7 Ramachandran et al. 2009. (Lifestyle modification +/- drug) 8 DeFronzo et al. 2011 9 Eriksson et al. 2006	1 Wein et al. 1999 (BCT3 Social support (unspecified)) 2 Liao et al. 2002 (Intervention Function 5 Training) 3 Lindstrom et al. 2003 (DPS Study – BCT63 Goal setting (outcome)) 4 Roumen et al. 2008 (Intervention Function 1 Education) 5 Lindahl et al. 2009 (BCT23 Behavioural practice/rehearsal) 6 Li et al. 1999 (BCT4 Pharmacological support) 7 Ramachandran et al. 2009. (Lifestyle modification +/- drug BCT4 Pharmacological support) 8 DeFronzo et al. 2011 (BCT4 Pharmacological support) 9 Eriksson et al. 2006 (BCT4 Pharmacological support)
	Evidence statement 2.7 Weight change In the short term (2 to 5 years), both lifestyle intervention and pharmacological interventions showed a greater weight change than control groups. Lifestyle interventions appear to have a greater weight change (range -5.6 kg to +0.16 kg) than pharmacological interventions (range -2.9 kg to +3.8 kg). The changes in weight in lifestyle interventions were based on seven studies: Sweden[1] (++), Netherlands[2] (++), Japan[3] (++), US (one [++][4]and one [+][5]) and Finland (both [++][6, 7]). The changes in weight in pharmacological interventions were based on nine studies: two multi-country studies (both [++])[8, 9], Canada/Europe[10] (++), US/Europe[11] (++), two US studies (one [++][4] and one [+][12]), Sweden[13] (++), India[14] (++) and China[15] (++). Maintenance of the weight loss was mentioned briefly by three studies, with one (++) Finnish study[6], saying weight maintenance was satisfactory and two studies – one (++) Japanese[3] and one (++) Netherlands[2] saying weight decreased after 1 year but increased slightly afterwards.	1 Lindhal et al. 2009 2 Roumen et al. 2008 3 Kosaka et al. 2005 4 Knowler et al. 2002.(Diabetes Prevention Program Research Group vs. lifestyle intervention) 5 Liao et al. 2002. 6 Lindstrom et al. 2003. (DPS Study) 7 Lindstrom et al. 2006 8 NAVIGATOR Study Groupa 2010 9 NAVIGATOR Study Groupb 2010 10 Chiasson et al. 2002 11 Heymsfield et al. 2000 12 DeFronzo et al. 2011 13 Torgerson et al. 2004 (lifestyle plus drug) 14 Ramachandran et al. 2009. (Lifestyle modification +/- drug) 15 Pan et al. 2003	1 Lindhal et al. 2009. (BCT23 Behavioural practice/rehearsal) 2 Roumen et al. 2008. (Intervention Function 1 Education) 3 Kosaka et al. 2005. (Intervention Function 1 Education) 4 Knowler et al. 2002.(Diabetes Prevention Program Research Group BCT4 Pharmacological support vs. lifestyle intervention) 5 Liao et al. 2002. (Intervention Function 5 Training) 6 Lindstrom et al. 2003. (DPS Study – BCT63 Goal setting (outcome)) 7 Lindstrom et al. 2006.(BCT63 Goal setting (outcome), BCT35 Body changes) 8 NAVIGATOR Study Groupa 2010(BCT4 Pharmacological support) 9 NAVIGATOR Study Groupb 2010.(BCT4 Pharmacological support) 10 Chiasson et al. 2002 (BCT4 Pharmacological support) 11 Heymsfield et al. 2000 (BCT4 Pharmacological support) 12 DeFronzo et al. 2011. (BCT4 Pharmacological support) 13 Torgerson et al. 2004 (lifestyle+BCT4 Pharmacological support) 14 Ramachandran et al. 2009. (Lifestyle modification +/- drug BCT4 Pharmacological support) 15 Pan et al. 2003. (BCT4 Pharmacological support)

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	2.8 Evidence statement 2.8 Change in blood pressure In the short term (2 to 5 years), both lifestyle and pharmacological interventions showed a slightly greater reduction in systolic blood pressure (a range of -10.0 to 4.4 mmHg, compared to a range of -4.3 to 5.5 mmHg) and diastolic blood pressure than control groups (a range of -6.2 to 2.0 mmHg, compared to a range of -4.0 to 3.6 mmHg). In the long term, based on one study with a 20-year follow-up, the diet and exercise intervention had a slightly smaller increase in systolic blood pressure than the control group (11 mmHg and 13 mmHg respectively) as well as having a slightly greater reduction in diastolic blood pressure than the control group (-7 mmHg and -5 mmHg respectively). However, this follow-up is vastly different to the other studies in this review, and with a 20-year follow-up many of these participants would be well into their 60s and therefore a rise in blood pressure would naturally be expected. The changes in blood pressure in lifestyle interventions were based on three studies, one (++) Swedish[1], one (-) Chinese[2] and one (++) study from the Netherlands[3]. The changes in blood pressure in pharmacological interventions were based on seven studies: Finland[4] (++), Sweden[5] (++), India[6] (++), US[7] (+), two from China (both [++])[8, 9] and two multi-country studies (both [++])[10, 11].	1 Lindahl et al. 2009. 2 Li et al. 2008. 3 Roumen et al. 2008. 4 Eriksson et al. 2006. 5 Torgerson et al. 2004 6 Ramachandran et al. 2009. 7 DeFronzo et al. 2011. 8 Li et al. 1999. 9 Pan et al. 2003. 10 NAVIGATOR Study Groupb 2010. 11 NAVIGATOR Study Groupa 2010.	1 Lindhal et al. 2009. (BCT23 Behavioural practice/rehearsal) 2 Li et al. 2008. (No behaviour change coding possible.) 3 Roumen et al. 2008. (Intervention Function 1 Education) 4 Eriksson et al. 2006 (BCT4 Pharmacological support) 5 Torgerson et al. 2004 (lifestyle+BCT4 Pharmacological support) 6 Ramachandran et al. 2009. (Lifestyle modification +/- drug BCT4 Pharmacological support) 7 DeFronzo et al. 2011 (BCT4 Pharmacological support) 8 Li et al. 1999 (BCT4 Pharmacological support) 9 Pan et al. 2003. (BCT4 Pharmacological support) 10 NAVIGATOR Study Groupb 2010 (BCT4 11 NAVIGATOR Study Groupa 2010 (BCT4 Pharmacological support)
	Evidence statement 2.9 Change in blood glucose In the short term (2 to 6 years), both lifestyle and pharmacological interventions tended to show a slightly greater reduction in fasting blood glucose and 2-hour glucose than control groups. In the long term, based on one study with a 20-year follow-up, the diet and exercise intervention had a slightly smaller increase in both fasting blood glucose and 2-hour glucose than the control group. For diet only and exercise only interventions, these were based on one (++) Chinese study[1]. The diet combined with exercise intervention was based on five studies: Netherlands[2] (++), Sweden[3] (++), Finland[4] (++) and China (one [-][5] and one [++][6]). The pharmacological interventions were based on six studies: US[7] (+), Sweden[8] (++), Finland[9] (++), China[10] (++), India[11] (++) and one multi country study[12] (++).	1 Pan et al. 1997. 2 Roumen et al. 2008. 3 Lindahl et al. 2009. 4 Lindstrom et al. 2003. 5 Li et al. 2008. 6 Pan et al. 1997. 7 DeFronzo et al. 2011. 8 Torgerson et al. 2004. 9 Eriksson et al. 2006. 10 Li et al. 1999. 11 Ramachandran et al. 2009. 12 NAVIGATOR Study Groupb 2010.	Coded above.
	Evidence statement 2.10 Change in waist circumference Both lifestyle and pharmacological interventions tended to show a slightly greater reduction in waist circumference than control groups. The diet combined with exercise intervention was based on four studies: Netherlands[1] (++), Sweden[2] (++), Finland[3] (++) and India[4] (++). The pharmacological interventions were based on one (++) study from Sweden[5].	1 Roumen et al. 2008. 2 Lindahl et al. 2009. 3 Lindstrom et al. 2003. 4 Ramachandran et al. 2006. 5 Torgerson et al. 2004	Coded above
	4.5 Perceived risk and seriousness of type 2 diabetes and engagement with prevention activities Evidence from two (both [+]) interview studies – one conducted in the UK and one in the Netherlands, suggests that service-user engagement with risk-assessment programmes is negatively affected by low perceived personal risk of type 2 diabetes as	1 Eborall et al. 2007. 2 Adriannse et al. 2001.	No behaviour change coding possible.

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	well as the low perceived seriousness of the condition.		
	4.9 Habitual activities There is evidence that existing habitual practices are difficult for service users to change from two (++) surveys [1], [2] and one (+) focus group study[3] conducted in Sweden, Finland and the US respectively.	1 Brekke et al. 2004. 2 Korkinkanga et al. 2011. 3 Satterfield et al. 2003.	No behaviour change coding possible.
	4.10 Lack of time and other commitments There was evidence that making lifestyle changes was hindered by other daily commitments and priorities from one survey study (+), one interview study (++) and one focus group study (+) conducted in Australia, UK and US respectively.	1 Satterfield et al. 2003. 2 Penn et al. 2008. 3 Hume et al. 2010.	No behaviour change coding possible.
	4.11 Health Beliefs There was evidence that some health beliefs can hinder healthy lifestyle change from four (three [++] and one [+]) interview studies, three conducted in the UK and one in Finland.	1 Eborall et al. 2007. 2 Troughton et al. 2008. 3 Jallinoja et al. 2007. 4 Penn et al. 2008.	No behaviour change coding possible.
	4.12 Lack of information and advice Evidence from two interview studies [++] and one focus group study [+] identified lack of optimum advice and information as barriers to lifestyle change.	Satterfield et al. (2003 + US) Troughton et al. (2008 ++ UK) Penn et al. (2008 ++ UK)	Inference derived from the evidence for info and advice (Intervention Function 1 Education).
	4.13 Not applicable – environmental factors providing barriers to lifestyle change	Not applicable	Not applicable
	4.15 Positive impact of behaviour change There was evidence for the positive effects of behaviour change on wellbeing in one interview study and one survey study (both [++]) conducted in the UK and Finland respectively.	1 Penn et al. 2008. 2 Korkinkanga et al. 2011.	No behaviour change coding possible.
	4.16 Social Support There was evidence that family and social support was a facilitator in carrying out behaviour change from one (++) interview study[1], two focus group studies (one [++] and one [+]) and one (++) survey study[4],one conducted in the UK, two in Finland and one in US.	1 Penn et al. 2008. 2 Jallinoja et al. 2007. 3 Satterfield et al. 2003. 4 Korkinkanga et al. 2011.	BCT Cluster 1 “Social Support”
	4.17 Information and support from professionals. There was evidence that health information and support could facilitate healthy lifestyle changes from two (both [++]) interview studies[1, 2] and one (++) focus group study[3]. Two were conducted in the UK and one in Finland. Interviews in the UK found that professional support was appreciated and was helpful in keeping to plans. Motivational interviewing, a style of counselling that encourages behaviour change, was particularly appreciated. They also found that attention to the optimal timing of information-giving allowed gradual absorption of change and therefore was a facilitator in allowing adjustment to changes[1] Jallinoja et al. (2007 ++; Finland) reported that focus group participants found check-up visits helpful in maintaining new behaviours. The prospect of undergoing formal measurements was a motivator to increase efforts. Similarly, interviewees in the study reported that having repeat tests was reassuring in term of maintaining efforts to change behaviour.	1 Penn et al. 2008. 2 Troughton et al. 2008. 3 Jallinoja et al. 2007.	Intervention Function 1 Education BCT3 Social support (unspecified)

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	Expert paper 2 “Implementing type 2 diabetes prevention programmes” [slide set and text document]	Not applicable	Not applicable – about program implementation
	Expert paper 7 “rolling out the U.S. National Diabetes Prevention program” [slide set] “National and international randomized trials, [5] including the U.S. Diabetes Prevention Program (DPP)[6], have established that in persons with prediabetes HALF of new cases of type 2 diabetes can be avoided by structured lifestyle intervention programs.”	Not applicable	Not applicable – about program implementation
	4.4 Not applicable “strategies to facilitate risk assessment attendance”	Not applicable	Not applicable – not about intervention effectiveness
	4.18 Autonomy and control There was evidence from one interview study [++] and one focus group study [++] that a sense of individual autonomy and control was a facilitator to behaviour change. Jallinoja et al. (2007 ++; Finland) identified increased autonomy and control over behaviour in focus group participants that were able to manage their weight. These individuals did not associate weight management with a battle in the same way as those who found it difficult to lose weight. They were able to motivate themselves and plan their own lifestyle without the aid of a clinician or advisor. Penn et al. (2008 ++; UK) also reported from interview findings that self-efficacy was an important factor in changing behaviour that was eventually incorporated into daily routines. Self-monitoring was a way of keeping to plans and allowing a balance between optimal and realistic goals.	**Qualitative** Jallinoja et al. (2007 ++; Finland) Penn et al. (2008 ++; UK)	No behaviour change coding possible.
	Cost-effectiveness	Not applicable	Not applicable
R8 Quality-assured, intensive lifestyle-change programmes: design and delivery Subset of bullets extracted: • Provide specially designed and quality-assured intensive lifestyle-change programmes for groups of 10–15 people at high risk of developing type 2 diabetes. … • Ensure programmes adopt a person-centred, empathy-building approach. This includes finding ways to help participants make gradual changes by understanding their beliefs, needs and preferences. It also involves building their confidence and self-efficacy over time. • Ensure programme components are delivered in a logical progression. For example: discussion of the risks and potential benefits of lifestyle change; exploration of someone's motivation to change; action planning; self-monitoring and self-regulation. …	Not applicable 4.3 Practitioner perceptions of barriers and facilitators to intervention implementation	Not applicable	Not applicable
	Not applicable 4.5 Perceived risk and seriousness of type 2 diabetes and engagement with prevention activities	Not applicable	Not applicable
	Not applicable 4.14 Cost	Not applicable	Not applicable
	Expert paper 8 (not quality appraised) **Evidence statement 4** “The relationship between using specific behaviour change techniques and effectiveness” [P7] is highly relevant. Evidence statement 4 Summary: Evidence was extracted from a range of causal and associative analyses in nine well-conducted systematic reviews. The evidence shows that a range of specific techniques (as described below) may increase levels of behaviour change and /or weight loss in interventions to support changes in diet and /or physical activity… See p7 http://www.nice.org.uk/nicemedia/live/12163/57040/57040.pdf	Supporting change in diet and physical activity behaviour for adults at risk of type 2 diabetes: A systematic review of reviews Colin Greaves, Kate Sheppard, Charles Abraham, Wendy Hardeman, Michael Roden, IMAGE Study Group, Peter Schwarz http://www.nice.org.uk/nicemedia/live/12163/57040/57040.pdf	Highly relevant – contains highly relevant evidence statements on behaviour change techniques that produce more effective interventions for weight loss using diet and or physical activity for people at risk of type II diabetes.

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
• Offer follow-up sessions at regular intervals (for example, every 3 months) for at least 2 years following the initial intervention period. The aim is to reinforce the positive behaviour change and to provide support, in case of relapse. Larger group sizes may be feasible for these maintenance sessions. **Evidence statements 2.1, 3.2, 3.3, 3.8, 3.9, 3.10, 4.3, 4.5, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14, 4.15, 4.16, 4.17, 4.18, 4.19; Additional evidence: expert paper 8**	Results section of abstract of the publication associated with this expert review: Of 3856 identified articles, 30 met the inclusion criteria and 129 analyses related intervention components to effectiveness. These included causal analyses (based on randomisation of participants to different intervention conditions) and associative analyses (e.g. meta-regression). Overall, interventions produced clinically meaningful weight loss (3-5 kg at 12 months; 2-3 kg at 36 months) and increased physical activity (30-60 mins/week of moderate activity at 12-18 months). **Based on causal analyses, intervention effectiveness was increased by engaging social support, targeting both diet and physical activity, and using well-defined/established behaviour change techniques. Increased effectiveness was also associated with increased contact frequency and using a specific cluster of "self-regulatory" behaviour change techniques (e.g. goal-setting, self-monitoring). No clear relationships were found between effectiveness and intervention setting, delivery mode, study population or delivery provider**. Evidence on long-term effectiveness suggested the need for greater consideration of behaviour maintenance strategies.	Same citation also here: Greaves et al., BMC Public Health, 2011 http://www.biomedcentral.com/content/pdf/1471-2458-11-119.pdf	
9 Quality-assured, intensive lifestyle-change programmes: content Intensive lifestyle-change programmes should offer ongoing tailored advice, support and encouragement to help people: • undertake a minimum of 150 minutes of 'moderate-intensity' physical activity per week • gradually lose weight to reach and maintain a BMI within the healthy range • increase their consumption of wholegrains, vegetables and other foods that are high in dietary fibre • reduce the total amount of fat in their diet • eat less saturated fat. Established behaviour-change techniques should be used (see NICE guidance on behaviour change), including at least all of the following: • Information provision: to raise awareness of the benefits of and types of lifestyle changes needed to achieve and maintain a healthy weight, building on what participants already know. • Exploration and reinforcement of participants' reasons for wanting to change and their confidence about making changes. This may include using motivational interviewing or similar techniques suitably adapted for use in groups. • Goal setting: prompting participants to set achievable and personally relevant short- and long-term goals (for example, to lose 5-10% of their weight in 1 year is a realistic initial target, or to be more physically active). • Action planning: prompting participants to produce action plans detailing what specific physical activity or eating behaviour they intend to change – and when, where and how this will happen. They	Evidence statements 2.1, 2.6, 2.7, 2.8, 2.9, 2.10, 4.9, 4.10, 4.11, 4.12, 4.13, 4.16, 4.17, expert paper 2 expert paper 7 (see above)		See ES3.8 below for behaviour change elements identified from successful interventions.
	3.1 Intervention setting	Not applicable	Not applicable
	3.2 Characteristics of those delivering interventions	Not applicable	Not applicable
	3.3 Mode of intervention delivery	Not applicable	Not applicable
	3.4 Frequency of contacts	Not applicable	Not applicable
	3.5 Dietary interventions [very relevant] There was evidence from four systematic reviews of randomised controlled trials (Baker et al. 2011++; Burnet et al. 2006 +; Waugh et al. 2010 ++; Paulweber et al. 2010 ++) and two non-systematic reviews of a range of study types (Davies et al. 2004 +; Roumen et al. 2009 -) for dietary components of lifestyle interventions for the prevention of type 2 diabetes. Baker et al. (2011++) assessed seven RCTs in which all participants were advised individually to modify their diet. All the interventions advised a reduction in fat (with four studies carried out in the US, Finland, China and Sweden) specifying a reduction to <20-30% of total energy intake, and six studies advised adjustment of portion control. Four studies (carried out in the US, India, Italy and Sweden) recommended an increase in fibre intake, and all seven studies advised increased fibre intake in the form of fruit and vegetables. Quality of the trials was assessed but not reported in detail; however the quality seems to be good since only trials that met threshold criteria were included in the review. Evidence from three systematic reviews of RCTs (Burnet et al. 2006 +; Waugh et al. 2010 ++; Paulweber et al. 2010 ++) and one non-systematic review (Roumen 2009 -) report similar detail from between five and nine diabetes prevention trials carried out in the US, Finland, China, Japan, Sweden, Australia, India, Netherlands and the UK regarding dietary aims to sustain a weight reduction of 5-7% when combined with physical activity goals. They include the consumption of 55% total energy intake as	Baker et al. 2011++ Burnet et al. 2006 + Waugh et al. 2010 ++ Paulweber et al. 2010 ++ Davies et al. 2004 + Roumen et al. 2009 -	See ES3.8 below for behaviour change elements identified from successful interventions.

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
should start with achievable and sustainable short-term goals and set graded tasks (starting with an easy task and gradually increasing the difficulty as they progress towards their goal). The aim is to move over time towards long-term, lifestyle change. • Coping plans and relapse prevention: prompting participants to identify and find ways to overcome barriers to making permanent changes to their exercise and eating habits. This could include the use of strategies such as impulse-control techniques (to improve management of food cravings). Participants should be encouraged to involve a family member, friend or carer who can offer emotional, information, planning or other practical support to help them make the necessary changes. For example, they may be able to join the participant in physical activities, help them to plan changes, make or accept changes to the family's diet or free up the participant's time so they can take part in preventive activities. (It may sometimes be appropriate to encourage the participant to get support from the whole family. Participants should be encouraged to use self-regulation techniques. This includes self-monitoring (for example, by weighing themselves, or measuring their waist circumference or both). They should also review their progress towards achieving their goals, identify and find ways to solve problems and then revise their goals and action plans, where necessary. The aim is to encourage them to learn from experience. **Evidence statements 2.1, 2.6, 2.7, 2.8, 2.9, 2.10, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.8, 3.9, 3.10, 3.11, 3.13, 3.14, 3.15, 3.16, 3,17, 3.18, 3.19, 3.20, 3.22, 3.23, 3.24, 3.25, 3.28, 3.29, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14, 4.16, 4.17, 4.18; Additional evidence: expert paper 2, expert paper 3, expert paper 5, expert paper 7**	carbohydrates; fat 30% - 35% of total energy with saturated fat ≤ 10%; protein 10-15 % of total energy intake and fibre ≥ 15g per 1000kcal. Quality ratings are not available within the reviews. There was also evidence from epidemiological studies included in two reviews of a range of study types (Burnet et al. 2006 +; Walker et al. 2010 +) that a diet of fruits, vegetables, legumes, fish and whole grains was associated with a lower diabetes risk. Epidemiological evidence from one non-systematic review of a range of study types (Davies et al. 2004+) suggests that the frequency of fruit and vegetable intake was inversely associated with HbA1c levels in the UK based EPIC study and that in the US, an increased intake of whole grains was associated with decreased diabetes risk, though there was no clinical significance reported. Quality ratings were not reported for these studies.		
	3.6 Physical activity interventions Evidence was obtained from two systematic reviews of randomised controlled trials (Baker et al. 2011++; Paulweber et al. 2010++) and one review of randomised and non-randomised controlled trials (Yates et al. 2007 +). Baker et al. (2011++) and Paulweber et al. (2010 ++) provided evidence from five and seven RCTs respectively in which participants had been advised to increase their level of physical activity. All trials reviewed reported a reduction in incidence of type 2 diabetes. The advice was to increase physical activity to a level of at least 150 minutes per week at moderate intensity in trials carried out in US, Italy, and Sweden. Baker et al. (2011 ++) also report that up to 30-40 minutes of moderate activity (e.g. brisk walking) per day was advised in one trial carried out in Japan. The US based and Chinese trial allowed participants to reduce the volume of activity if it was carried out more vigorously. Resistance training was included in some US and Finnish based clinics. A Swedish trial included counselling on the importance of muscular strengthening twice a week. Supervised physical activity was included free of charge 2 days per week in the US and Finnish trials. The Swedish trial included a residential component of 2.5 hours per day for one month. Quality of the trials was assessed but not reported in detail; however the quality seems to be good since only trials that met threshold criteria were included in the review. Evidence from one systematic review of randomised and non-randomised controlled trials (Yates et al. 2007 +) suggests that, from four included RCTs that assessed the reduction of type 2 diabetes incidence (carried out in US, China, Finland and Sweden), risk of diabetes was reduced by 42-63% compared to the control groups. Quality assessment was not reported on the studies. Issues that may have impacted on the findings include self-reporting of physical activity and use of physical activity questionnaires that lack validity.	Baker et al. 2011++ Paulweber et al. 2010++ Yates et al. 2007 +	See ES3.8 below for behaviour change elements identified from successful interventions.

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	There is a lack of good quality evidence that assesses the effect of diet and physical activity alone in trials that have demonstrated reduction in type 2 diabetes incidence and / or weight reduction. Therefore, it is difficult to make inferences about the impact that any particular form, volume or intensity of physical activity may have on outcomes.		
	3.8 Behavioural components There was evidence from four systematic reviews of randomised controlled trials (Baker et al. 2011++; Burnet et al. 2006 +; Norris et al. 2007 ++; Yuen et al. 2010 ++), for the use of behavioural strategies to enhance effectiveness of interventions. Baker et al. 2011++ […] suggest that information and advice alone is insufficient to bring about lifestyle change compared to theoretically-based detailed lifestyle interventions such as those used in the major diabetes prevention trials. These include: staging of information provision and tailoring programmes to individual needs; using multiple sessions to reinforce information; delivery to small groups or individuals; delivering written information as well as verbal advice; encouraging self-monitoring; and logging of physical activity, diet and weight change. For dietary behaviour change, taking small steps and providing both observational and vicarious leaning opportunities as well as encouraging the identification of barriers and problem solving were reported as strategies used in prevention programmes that had achieved reduction in diabetes incidence. For physical activity, a prescriptive approach that gradually increased the frequency and volume of activity over time as well as providing observational and vicarious leaning opportunities and encouraging self-monitoring were suggested. Three of the successful trials also included direct supervision of physical activity. Norris et al. 2007 ++ and Yuen et al. 2010 ++ also assessed RCTs for prevention of diabetes (carried out in the US, UK, India, France, Finland, the Netherlands and Japan) and reported on the importance of gradually increasing volume and frequency of physical activity levels and of the importance of encouragement through direct supervision. Regular reinforcement of set goals was reported as an important Burnett et al. (2006 +) reported from three trials carried out in the US, Finland and Sweden that self-monitoring through the use of regular weighing, and recorded measurement of dietary input and physical activity increased self-efficacy and empowerment. Family was a key social support in prevention efforts. Trials carried out in the US, Finland, China and Sweden encouraged spouses, where appropriate, to co-participate in counselling sessions. Trials in the Norris and Yuen reviews were quality assessed and rated as generally having high risk for bias.	Baker et al. 2011++ Burnet et al. 2006 + Norris et al. 2007 ++ Yuen et al. 2010 ++	BCT10 Self-Monitoring of behaviour BCT11 Self-monitoring of outcomes BCT29 Graded tasks BCT89 Vicarious consequences BCT61 Problem solving BCT64 Action planning BCT12 Monitoring of behaviour without feedback BCT Cluster 1 “Social Support”
	3.9 Characteristics of intervention recipients	Not applicable	Not applicable
	3.10 Strategies to encourage attendance / adherence	Not applicable	Not applicable
	3.11 Translational studies based on the DPP **Modifications to the DPP interventions**	Kulzer et al. 2009 Ackermann et al. 2008	Not applicable - service implementation

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	There was strong evidence [++; +; -] for successful modifications of the DPP protocol. One randomised controlled trial (Kulzer et al. 2009 + Germany), two pilot cluster randomised controlled trials (Ackermann et al. 2008 + US; Whittemore et al. 2009 ++ US), two matched pair and one controlled cohort study (Almeida et al. 2010 ++, US; Faridi et al. 2009 - US; McTigue et al. 2009a + US), four pre-test / post-test single group studies (Amundsen et al. 2009 +, US; Davis-Smith 2007 + US; Kramer 2009 + US; McTigue et al. 2009b + US; Seidal et al. 2008 + US), and one non-randomised controlled feasibility trial (Vadheim et al. 2010 + US) all adapted the DPP in a range of settings including primary care, YMCA facilities, and churches. Two studies (McTigue et al. 2009b + US; Vadheim 2010 + US) used technology such as the internet and video-conferencing to access the target audience.	Whittemore et al. 2009 Almeida et al. 2010 Faridi et al. 2009 McTigue et al. 2009a Amundsen et al. 2009 Davis-Smith 2007 Kramer 2009 McTigue et al. 2009b Seidal et al. 2008 Vadheim et al. 2010	
	3.13 Translational studies based on the DPP **Changes in blood glucose levels** There was mixed evidence [++;+] from one randomised controlled trial, two pilot cluster randomised controlled trials and two pre-test / post-test single group studies for reductions in blood glucose following interventions translated into community settings.	Kulzer et al. 2009 + Germany Davis-Smith 2007 + US Ackermann et al. 2008 + US Whittemore et al. 2009 ++ US Seidal et al. 2008 + US	Not applicable - service implementation
	3.14 Translational studies based on the DPP **Weight change** There was strong evidence [++; +] from 11 studies based on the DPP protocol for achievement of weight loss and weak evidence [-] from one non-randomised study of	See evidence review 3 for full list of studies. Review 3: Prevention of type 2 diabetes: reviewing mechanisms of successful interventions and translation of major trial evidence into practice	Not applicable - service implementation
	3.15 Translational studies based on the DPP **Changes to BMI** There was strong evidence [++; +] from six studies based on the DPP for reduction in BMI following intervention and mixed evidence [-] from one non-randomised study.	See evidence review 3 for full list of studies. Review 3: Prevention of type 2 diabetes: reviewing mechanisms of successful interventions and translation of major trial evidence into practice	Not applicable - service implementation
	3.16 Translational studies based on the DPP **Changes in waist circumference** Moderate evidence [+] exists from 3 studies for reduction in waist circumference following intervention.	Kulzer et al. 2009 + Germany Kramer et al. 2009 +US Seidal et al. 2008 + US	Not applicable - service implementation
	3.17 Translational studies based on the DPP **Changes in achievement in goals** There was strong evidence available [++; +] from five studies (Amundsen et al. 2009 + US; Faridi et al. 2009 - US; Kulzer et al. 2009 + Germany; Vadheim et al. 2010 + US; Whittemore et al. 2009 ++ US) for changes in achievement in goals following intervention.(physical activity and dietary goals)	Amundsen et al. 2009 Faridi et al. 2009 Kulzer et al. 2009 Vadheim et al. 2010 Whittemore et al. 2009	Not applicable - service implementation
	3.18 Translational studies based on the DPP **Participation / Attendance / Adherence**	Not applicable	Not applicable - service implementation
	3.19 Translational studies based on the DPP	Seidal et al. 2008	Not applicable - service implementation

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	Sustainability There was moderate evidence [+] from one pre-test / post-test single group study (Seidal et al. 2008 + US) that the achievement of a 5% - 7% weight reduction by 46.4% of the sample following the lifestyle intervention was sustained at 6 months follow up (66.7% achieved 5% weight reduction and 87.5% achieved 7% reduction		
	3.20 Translational studies based on the DPS **Modifications to the DPS interventions** There was moderate evidence [+] for successful modifications of the DPS protocol.	Absetz et al. 2009 + Finland; Laatikainen et al. 2007 + Australia; Saaristo et al. 2007 + Finland	Not applicable - service implementation
	3.22 Translational studies based on the DPS **Changes in blood glucose levels** There was moderate evidence [+] from two pre-test / post-test studies for positive changes in blood glucose levels following intervention.	Absetz et al. 2009 + Finland; Laatikainen et al. 2007 + Australia; Saaristo et al. (2010 + Finland)	Not applicable - service implementation
	3.23 Translational studies based on the DPS Weight change There was moderate evidence [+] from 3 pre-test / post-test studies based on the DPS protocol for weight loss following translational interventions. However, none of these studies included a comparator. Mean weight was reduced in three studies (Absetz et al. 2009 + Finland; Laatikainen et al. 2007 + Australia; Saaristo et al. + 2007 Finland) at 12 months follow up. Two studies (Laatikainen et al. 2007 + Australia; Saaristo et al. + 2007 Finland) achieved a mean weight loss of 2.5 kg (95% CI, 1.85 to 3.19) and 1.2 kg ($p<0.0001$) respectively. In one study (Absetz et al. 2009 + Finland) mean weight reduction of 0.8 kg at 12 months ($p=0.002$) was maintained at 3 years (1.0 kg; $p=0.003$).	Not applicable	Not applicable - service implementation
	3.24 Translational studies based on the DPS Changes to BMI Moderate evidence [+] exists from 3 pre-test / post-test studies based on the DPS protocol for reduction in BMI at 12 months following intervention. Mean BMI was reduced from baseline to 12 months follow up in three studies (Absetz et al. 2009 + Finland; Laatikainen et al. 2007 + Australia; Saaristo et al. 2007 + Finland), with reductions ranging from 0.3 kg/m2 to 0.93 kg/m2. At three years, a further reduction of 0.2 kg/m2 was observed in one study (Absetz et al. 2009 + Finland).	Not applicable	Not applicable - service implementation
	3.25 Translational studies based on the DPS **Changes in waist circumference** Moderate evidence [+] exists from three studies for reduction in waist circumference following intervention. Waist circumference was reported to decrease in all three DPS based pre-test / post-test studies (Absetz et al. 2009 + Finland; Laatikainen et al. 2007 + Australia; Saaristo et al. 2007 + Finland), ranging from -1.6cm to -4.2cm at 12 months. However, the reduction at 12 months was not sustained at three years in one study (Absetz et al. 2009 + Finland).	Not applicable	Not applicable - service implementation
	3.28 Translational studies based on the DPS **Sustainability** There is moderate evidence [+] from one DPS based study relating to sustainability of outcomes beyond the 12 month follow-up. Only one pre-test / post-test single group study (Absetz et al. 2009 + Finland) had a follow up longer than 12 months. Whilst weight loss (0.8 kg) and BMI reduction (0.3 kg/m2) at 12 months was maintained at 3	Not applicable	Not applicable - service implementation

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
	years (1.0 kg and 0.5 kg/m2), waist circumference reduction at 12 months (1.6 cm) was not sustained (0.1 cm).		
	3.29 Weight loss achievement in translational studies compared with the DPP and DPS. There was strong evidence [+; ++] for similar trends in weight loss achievements in randomised controlled translational studies to those achieved in the DPP and DPS at 12 months, though effects were generally weaker.	Not applicable	Not applicable - service implementation
	4.8 Barriers to carrying out lifestyle changes **Physical health**	Not applicable	Not applicable - barriers
	4.14 Barriers to carrying out lifestyle changes **Cost**	Not applicable	Not applicable- cost
	4.18 Autonomy and control There was evidence from one interview study [++] and one focus group study [++] that a sense of individual autonomy and control was a facilitator to behaviour change. Jallinoja et al. (2007 ++; Finland) identified increased autonomy and control over behaviour in focus group participants that were able to manage their weight. These individuals did not associate weight management with a battle in the same way as those who found it difficult to lose weight. They were able to motivate themselves and plan their own lifestyle without the aid of a clinician or advisor. Penn et al. (2008 ++; UK) also reported from interview findings that self-efficacy was an important factor in changing behaviour that was eventually incorporated into daily routines. Self-monitoring was a way of keeping to plans and allowing a balance between optimal and realistic goals.	Not applicable	Not applicable – facilitators and barriers
	Expert paper 3	See EP3: community-based diabetes prevention - Melanie Davies	Not applicable – secondary report of research
	Expert paper 5	See EP5: translation of trial evidence into practice across Europe - Peter Schwarz	Not applicable – service implementation.
R11 Raising awareness of the importance of physical activity • Find out what people already know about the benefits of physical activity and the problems associated with a sedentary lifestyle. Where necessary, provide this information. In addition, explain that being more physically active can help reduce their risk of type 2 diabetes, even when that is the only lifestyle change they make. • Explain that the government recommends a minimum of 150 minutes of 'moderate-intensity' activity per week which can be taken in bouts of 10 minutes or more. Explain that people can also meet the minimum recommendation by doing 75 minutes of 'vigorous-intensity' activity spread across the week – or by combining bouts of moderate and vigorous-intensity activity. Explain that this should include activities to increase muscle strength on 2 days a week. (See the full recommendations in Start active, stay active for examples.)	**Evidence statements** 2.1, 2.5, 3.6, 3.8, 3.9, 3.10, 3.11, 3.17, 4.8, 4.9; Additional evidence: expert paper 2, expert paper 4, expert paper 5, expert paper 7 (see above)	See above	See above
	2.3 Network meta-analysis The network meta-analysis comparison of the effect of diet only and diet + exercise for short-term and medium-term interventions showed a greater effect in short-term studies (diet v placebo: population HR 0.63 95% CrI 0.29-1.34; diet + exercise v placebo : population HR 0.43 95% CrI 0.31-0.59) compared to medium-term studies (diet v placebo : population HR 0.73 95% CrI 0.37-1.79; diet + exercise v placebo : population HR 0.56 95% CrI 0.30-0.93) The network meta-analysis comparison of diet versus placebo incorporates indirect evidence about the treatment effect from related studies as well as direct evidence from one short-term study (Wein et al. 1999 -) and two mid-term studies (Pan et al. 1997 ++, Jarrett et al. 1979 +). The network meta-analysis comparison of diet plus exercise versus placebo incorporates indirect evidence about the treatment effect from related studies as well as direct evidence from five short-term studies (Roumen et al. 2008 ++, Ramachandran et al. 2006 ++, Kosaka et al. 2005 ++, Knowler et al. 2002 ++, Liao et al. 2002 +) and three	Not applicable	Not applicable – about overall effectiveness of short and medium studies and also effectiveness of single vs. multicomponent interventions, rather than content of such studies.

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
• In cases where it is unrealistic to expect someone to meet the recommended minimum, explain that even small increases in physical activity will be beneficial – and can act as a basis for future improvements. • Explain that people should also reduce the amount of time they spend sitting at a computer or watching TV. Encourage them to be more active during work breaks, for example, by going for a walk at lunchtime. • Explain that some people may need to be more physically active to help lose weight or maintain weight loss (see NICE guidance on obesity). **Evidence statements** 2.1, 2.3, 2.4, 2.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11, 3.17, 4.8, 4.9; Additional evidence: expert paper 2, expert paper 4, expert paper 5, expert paper 7	medium-term studies (Lindahl et al. 2009 ++, Penn et al. 2009 ++, Lindstrom et al. 2006 ++).		
	2.4 Probability of treatment ranking The network meta-analysis of the short-term trials showed that, of all 12 interventions being compared, diet + exercise + 0.6 mg voglibose (daily) had the greatest probability of being the most effective intervention (probability=0.589) followed by diet + exercise + 20 mg pioglitazone (daily) (probability=0.324). When considering the evidence in the network meta-analysis about lifestyle interventions, diet + exercise had the greatest probability of being the most effective intervention (probability=0.900). For the mid-term trials, the network meta-analysis showed that, of all interventions being compared, diet + 50mg phenformin had the greatest probability of being the most effective intervention (probability=0.345), followed by diet + exercise + up to 60mg nateglinide (3 times daily) (probability=0.338) and 50mg phenformin (probability=0.153). When considering the evidence in the network meta-analysis about lifestyle interventions, diet + exercise had the greatest probability of being the most effective intervention (probability=0.812). There was insufficient evidence over the short and mid-term to suggest that age and BMI were treatment effect modifiers.	Not applicable	Not applicable -intervention effectiveness without reference to detailed contents of interventions.
	3.7 Intensity / duration of physical activity Evidence exists from one systematic review of randomised controlled trials (Waugh et al. 2010 ++). There is a lack of evidence that directly compares intervention effectiveness between different intensities and duration of physical activity, therefore it was not possible to determine the potential scale of the impact that different intensities may have.	Waugh et al. 2010	No behaviour change coding possible.
R12 Providing tailored advice on physical activity • Help people to identify which of their activities involve 'moderate' or 'vigorous' physical activity and the extent to which they are meeting the national minimum recommendation on physical activity. Use a validated tool such as the Department of Health's general practitioner physical activity questionnaire or the international physical activity questionnaire (IPAQ). • Encourage people to choose physical activities they enjoy or that fit easily within their daily lives. For example, they may choose to do specific activities such as walking, cycling, swimming, dancing or aerobics. Or they could build physical activity into their daily life – for example, by walking or cycling instead of using a car for short journeys, and by taking the stairs instead of the lift. • Encourage people to set short and long-term goals for example, on how far they walk or cycle, or the number or length of activities	Evidence statements 2.1, 2.3, 2.4, 2.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11, 3.17, 4.8, 4.10, 4.14, 4.15, 4.16, 4.18; Additional evidence: expert paper 2, expert paper 5, expert paper 7 (see above)	See above.	See above
	4.19 Environmental factors	Not applicable	Not applicable – community level
	Expert paper 4 “Lifestyle interventions have been shown to reduce the risk of type 2 diabetes by 40-60%” (Gillies et al. BMJ 2007) The PREPARE programme (structured education with or without pedometer use, physical activity recommendations, barriers, action plans and diaries)	Expert Paper 4: community-based diabetes prevention-PREPARE - Tom Yates Gillies et al. BMJ 2007 (Systematic review and meta-analysis including meta-regression) PREPARE programme: Yates et al. 2008, Patient Education and	No behaviour change coding possible.

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
undertaken every week In addition, encourage them to keep a record of their activity for example, by using a pedometer and to record the things that make it easier or harder. Help them to find other ways to identify and overcome any barriers to physical activity • Consider referring people who want structured or supervised exercise to an exercise referral scheme or supervised exercise sessions, as part of an intensive lifestyle-change programme. Evidence statements 2.1, 2.3, 2.4, 2.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11, 3.17, 4.8, 4.10, 4.14, 4.15, 4.16, 4.18, 4.19; Additional evidence: expert paper 2, expert paper 4, expert paper 5, expert paper 7		Counselling 73, 264-271	
R13 Weight management advice (target Adults at high risk of developing type 2 diabetes with a BMI of 25 kg/m2 or more (23 kg/m2 or more if the person is of South Asian or Chinese descent). • Advise and encourage overweight and obese people to reduce their weight gradually by reducing their calorie intake. Explain that losing 5–10% of their weight in 1 year is a realistic initial target that would help reduce their risk of type 2 diabetes and also lead to other, significant health benefits. • Use evidence-based behaviour-change techniques to help overweight and obese people eat less, be more physically active and make long term changes to their diet that result in steady weight loss (see recommendation 14). • Motivate and support overweight and obese people to continue to lose weight until they have achieved – and can maintain – a BMI within the healthy range. (For the general population, the healthy range is between 18.5 and 24.9 kg/m^2. For people of South Asian or Chinese descent, the range is likely to be between18.5 and 22.9 kg/m^2.) • Encourage people to check their weight and waist measurement periodically. Provide brief advice about how to measure their waist correctly (for an example, visit the British Heart Foundation website). • Offer people with a BMI of 30 kg/m^2 or more (27.5 kg/m^2 or more if South Asian or Chinese) a structured weight-loss programme as part of, or to supplement, the intensive lifestyle-change programme. Or, if more appropriate, offer them a referral to a dietician or another appropriately trained health professional. Ensure they are given a personal assessment and tailored advice about diet, physical activity and what techniques to use to help change their behaviour. • GPs and other health professionals should continue to monitor, support and care for people with a BMI of 30 kg/m^2 or more (27.5 kg/m^2 or more if South Asian or Chinese) who join slimming	Evidence statements 2.1, 2.6, 2.7, 2.10, 3.1, 3.2, 3.5, 3.6, 3.8, 3.10, 3.11, 3.14, 3.15, 3.16, 3.17, 3.19, 3.20, 4.9, 4.13, 4.18; Additional evidence: expert paper 2, expert paper 5, expert paper 7 (see above)	Not applicable	See above.
	2.2 Pharmacological interventions [Evidence review for guidance conducted a meta-analysis] The meta-analysis of hazard ratios shows that pharmacological interventions (pooled HR 0.64 95% CI 0.53-0.76) can reduce the progress to diabetes for people with IGT (impaired glucose tolerance). Both types of intervention, oral diabetes drugs (HR 0.60 95% CI 0.44-0.82), and antiobesity drugs (HR 0.67 95% CI 0.55-0.81) had a beneficial effect. The hazard ratio for oral diabetes drugs was based on twelve studies, Three multicountry study (Dream Trial Investigators 2006 ++, NAVIGATOR Study Groupa 2010++, NAVIGATOR Study Groupb 2010 ++),one study in each of the following countries Canada/Europe (Chiasson et al. 2002 ++), Finland (Erkisson et al. 2006 ++), Japan (Kawamori et al. 2009 ++), two US (Diabetes Prevention Program Research Group 2009 ++, DeFronzo et al. 2011 +) , two Indian (Ramachandran et al. 2006 ++; Ramachandran et al. 2009 ++)` and two Chinese (Li et al. 1999 ++; Pan et al. 2003 ++). For anti-obesity drugs, the hazard ratio was based two studies, one US/Europe (Heymsfiled et al. 2000 ++) and one Swedish (Torgerson et al. 2004 ++)	Dream Trial Investigators 2006 NAVIGATOR Study Groupa 2010 NAVIGATOR Study Groupb 2010 Chiasson et al. 2002 Erkisson et al. 2006 Kawamori et al. 2009 Diabetes Prevention Program Research Group 2009 DeFronzo et al. 2011 Ramachandran et al. 2006 Ramachandran et al. 2009 Li et al. 1999 Pan et al. 2003 Heymsfiled et al. 2000 Torgerson et al. 2004	BCT4 Pharmacological support

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
clubs or other weight-loss programmes. • GPs should consider offering orlistat, in conjunction with a low-fat diet, to help those who are unable to lose weight by lifestyle-change alone (see recommendation 20). • If the above weight management interventions have been unsuccessful, refer people to a specialist obesity management service (see NICE guidance on obesity). Evidence statements 2.1, 2.2, 2.6, 2.7, 2.10, 3.1, 3.2, 3.5, 3.6, 3.8, 3.10, 3.11, 3.14, 3.15, 3.16, 3.17, 3.19, 3.20, 4.9, 4.13, 4.18; Additional evidence: expert paper 2, expert paper 5, expert paper 7			
R14 Dietary advice • Find out what people already know about the types and amounts of food and drink that can help reduce the risk of type 2 diabetes. Provide this information where necessary. Explain that increasing dietary fibre intake and reducing fat intake (particularly saturated fat) can help reduce the chances of developing type 2 diabetes. • Help people to assess their diet and identify where and how they could make it healthier, taking into account their individual needs, preferences and circumstances. (For example, take into account whether they need to lose weight or if they have a limited income.) • Encourage people to: ○ Increase their consumption of foods that are high in fibre, such as wholegrain bread and cereals, beans and lentils, vegetables and fruit. ○ Choose foods that are lower in fat and saturated fat, for example, by replacing products high in saturated fat (such as butter, ghee, some margarines or coconut oil) with versions made with vegetable oils that are high in unsaturated fat, or using low-fat spreads. ○ Choose skimmed or semi-skimmed milk and low-fat yoghurts, instead of cream and full-fat milk and dairy products. ○ Choose fish and lean meats instead of fatty meat and processed meat products (such as sausages and burgers). ○ Grill, bake, poach or steam food instead of frying or roasting (for example, choose a baked potato instead of	Evidence statements 2.1, 2.3, 2.4, 2.5, 2.6, 2.7, 2.10, 3.5, 3.8, 3.11, 4.7, 4.9, 4.10, 4.13, 4.15, 4.18; Additional evidence: expert paper 2, expert paper 5, expert paper 7; IDE (see above)	See above.	See above.
	4.7 Perceived barriers to intervention implementation in practice Evidence was available from one survey study [+]. Harris et al. (2004 [+] Canada) reported that a lack of awareness of available intervention tools, meant that behaviour change techniques were less likely to be used than generic advice or hand-outs. Practitioners also suggested that service user motivation to make lifestyle changes was a barrier to implementing interventions. There was a perception among practitioners that service users may not engage in lifestyle change due to lack	Harris et al. 2004 [+] (Canada)	No behaviour change coding possible.
	Commissioned report Interventions to prevent or delay progression to type 2 diabetes in those at high risk. Twenty-four unique projects were identified: 10 concerned solely with risk identification, nine with prevention and five with a combination of both. Eight literature reviews provided contextual and supporting evidence. Most evidence involves very small sample sizes based on descriptive (not experimental) evaluation designs. The diversity of approaches adopted by the different projects combine with these methodological limitations to prevent firm conclusions being drawn about the most effective interventions, but common themes did emerge as described below and in box 1.	Commissioned report: 'A pragmatic review of methods to identify and monitor adults at high risk of developing type 2 diabetes, and interventions to prevent progression to type 2 diabetes, in disadvantaged and vulnerable groups' See Box 1 [p3 of 73] for a summary of the main facilitators and barriers to successful implementation and outcomes common to both risk identification and interventions.	No behaviour change coding possible.

Relevant recommendation (5,6,8,9,11-14)	Evidence statement	Studies behind statement	Behaviour change coding (BCT, BCT Cluster, Intervention Function)
chips). ○ Avoid food high in fat such as mayonnaise, chips, crisps, pastries, poppadums (papads) and samosas. ○ Choose fruit, unsalted nuts or low-fat yoghurt as snacks instead of cakes, biscuits, bombay mix or crisps. Evidence statements 2.1, 2.3, 2.4, 2.5, 2.6, 2.7, 2.10, 3.5, 3.8, 3.11, 4.7, 4.9, 4.10, 4.13, 4.15, 4.18; Additional evidence: commissioned report, expert paper 2, expert paper 5, expert paper 7; IDE			

B. Behaviour change coding frame

The information below is adapted from the BCT Taxonomy v1 coding manual (Michie et al., 2011; 2012).

1. The 89-item BCT Taxonomy (May 2012)[1]

The taxonomy below aims to provide a comprehensive list of all behaviour change techniques (BCTs) that could feasibly be used in an intervention. There are 89 BCTs in this current iteration, each of which has been categorised into one of 16 clusters. Although not explicitly defined in the original taxonomy, definitions of each of the cluster headings were developed by the expert advisor (Dr Benjamin Gardner; BG) to aid coding.

A glossary (provided by BG) was provided to clarify terms marked with an asterisk (*) in the table below.

What is a 'Behaviour Change Technique' (BCT)?

Behaviour Change Techniques (BCTs):

i) contain verbs (e.g., provide, advise, arrange, prompt) that refer to the action(s) taken by the person(s) delivering the technique. BCTs can be delivered by the interventionist or self-delivered

ii) contain the term **'behaviour'** referring to a single action or sequence of actions that includes the performance of **wanted** behaviour(s) and/or inhibition (non-performance) of **unwanted** behaviour(s)

a. Clusters of BCTs

1) Social support (BCTs 1 to 3)

Care, assistance, help or support for performance of the behaviour is provided by others.

2) Regulation (BCTs 4 to 7)

Controlling one's emotions, thoughts or impulses.

3) Feedback and monitoring (BCTs 8 to 14)

Recording behaviour or its outcomes, and/or providing feedback on behaviour or its outcomes.

4) Associations (BCTs 15 to 22)

Making new associations between behaviour and cues or rewards, or managing existing such associations.

5) Repetition and substitution (BCTs 23 to 29)

Practising, rehearsing or repeating a behaviour, or directly replacing a new wanted behaviour for an existing unwanted behaviour

6) Antecedents (BCTs 30 to 35)

[1] A more extensive 93-item version of this taxonomy (BCT Taxonomy v1) has since been developed, and a manuscript reporting this work has been submitted for publication (Michie et al., 2012).

Managing the social and environmental situations and events, emotions, or thoughts that elicit an existing unwanted behaviour, or have the potential to elicit a new wanted behaviour.

7) Shaping knowledge (BCTs 36 to 39)

Providing information, instructions, or explanations around the behaviour.

8) Self-belief (BCTs 40 to 43)

Fostering confidence in one's ability to perform the behaviour.

9) Scheduled consequences (BCTs 44 to 53)

Emphasising or changing rewards or punishments arising from the behaviour.

10) Reward and threat (BCTs 54 to 60)

Rewarding or punishing new or old behaviours.

11) Goals and planning (BCTs 61 to 69)

Managing behaviour or outcome goals, and/or how behaviour or outcomes will be achieved

12) Comparison of outcomes (BCTs 70 to 72)

Considering relative pros and cons of outcomes of various behaviours

13) Identity (BCTs 73 to 77)

Managing how one sees, thinks or feels about oneself or the behaviour.

14) Natural consequences (BCTs 78 to 83)

Providing information about the naturally-occurring consequences of the behaviour.

15) Comparison of behaviour (BCTs 84 to 86)

Comparing own behaviour to an ideal performance or to others' beliefs or behaviour

16) Covert learning (BCTs 86 to 89)

Imagining consequences of behaviour, or observing consequences of the behaviour for others.

b. The 89 Item BCT taxonomy (adapted, with permission, from Michie et al., 2012)

In coding BCTs a conservative approach was taken. The coding guidance stated "never infer the presence of a BCT. The description must correspond to the definition of the BCT given in the taxonomy" (Michie et al, 2012).

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
Social support ***Care, assistance, help or support provided by others for performance of the behaviour.***						
1.	***Social support (practical)***	Advise on, arrange, or provide social support in the form of practical help for performance of the behaviour	*Ask the partner of the patient to put their tablet on the breakfast tray so that the patient remembers to take it*	*If support is emotional, code **2 (Social support (emotional))*** *If support is general or unspecified, code **3 (Social support (unspecified))***		IF9
2.	***Social support (emotional)***	Advise on, arrange, or provide emotional social support for performance of the behaviour.	*Ask the patient to take a partner or friend with them to their colonoscopy appointment*	*If support is practical, code **1, Social support (practical).*** *If support is general or unspecified, code **3, (Social support (unspecified))***		IF9
3.	***Social support (unspecified)***	Advise on, arrange or provide social support *(e.g. friends, relatives, colleagues,' buddies')* or non-contingent praise or reward for performance of the behaviour. It includes encouragement and counselling, but only when it is directed at the **behaviour**	*Advise the person to call a 'buddy' when they experience an urge to smoke* *Arrange for a housemate to encourage continuation with the behaviour change programme* *Give information about a self-help group that offers support for the behaviour*	*Attending a group class does not necessarily imply this BCT – support must be explicitly mentioned.* *If support is practical, code **1, Social support (practical).*** *If support is emotional, code **2, Social support (emotional)***		IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
Regulation ***Controlling one's emotions, thoughts or impulses.***						
4.	***Pharmacological support***	Provide, or encourage the use of or adherence to, drugs to facilitate behaviour change	*Suggest the patient asks the family physician for nicotine replacement therapy to facilitate smoking cessation*			IF9
5.	***Reduce negative emotions*** (includes '**stress management'**)	Advise on ways of reducing negative emotions to facilitate performance of the behaviour	*Advise on the use of stress management skills, e.g. to reduce anxiety about joining Alcoholics Anonymous*			IF9
6.	***Conserving mental resources***	Advise on ways of minimising demands on mental resources to facilitate behaviour change	*Advise smokers on how to minimise work-related stress during the first weeks of quitting*			IF9
7.	***Paradoxical instructions***	Advise to engage in some form of the unwanted behaviour with the aim of reducing motivation to engage in that behaviour	*Advise a smoker to smoke twice as many cigarettes a day as they usually do* *Tell the person to stay awake as long as possible in order to reduce insomnia*			IF3

No.	Label	Definition	Examples	Notes	Also code	*Linked interventi on functions*
Feedback and monitoring ***Recording behaviour or its outcomes, and/or providing feedback on behaviour or its outcomes.***						
8.	***Feedback on behaviour***	Monitor and provide feedback on performance of the behaviour itself *(e.g. form, frequency, duration, intensity)* , NOT the outcome of the behaviour.	*Inform the person of how many steps they walked each day (as recorded on a pedometer) or how many calories they ate each day (based on a food consumption questionnaire)*	*If feedback is on OUTCOME(S) of behaviour, code* ***9, Feedback on outcome(s) of behaviour.*** ***If unclear*** *whether feedback is on behaviour or OUTCOME(S) of behaviour,* ***code 9, Feedback on outcome(s) of behaviour.*** *If there is no clear evidence that feedback was given, code* ***12, Monitoring of behaviour by others without feedback.*** *If Biofeedback, code only* ***14 Biofeedback*** *and* *not* ***8, Feedback on behaviour****.*		IF1 IF2 IF3 IF4 IF5

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
9.	***Feedback on outcome(s) of behaviour***	Monitor and provide feedback on the outcome of performance of the behaviour.	*Inform the person of how much weight they have lost following the implementation of a new exercise regime*	*If feedback is on BEHAVIOUR itself, code **8, Feedback on behaviour**.* ***If unclear** whether feedback is on behaviour or OUTCOME(S) of behaviour, **code 9, Feedback on outcome(s) of behaviour.*** *If there is no clear evidence that feedback was given code **13, Monitoring outcome(s) of behaviour by others without feedback.*** *If Biofeedback, code only **14, Biofeedback** and not **9, Feedback on outcome(s) of behaviour***		IF1 IF2 IF3 IF4 IF5

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
10.	***Self-monitoring of behaviour***	Establish a method for the person to monitor and record their behaviour(s) as part of a behaviour change strategy.	*Ask the person to record daily, in a diary, whether they have brushed their teeth for at least two minutes before going to bed* *Give patient a pedometer and a form for recording daily total number of steps*	*If monitoring is only part of a data collection procedure rather than a strategy aimed at changing behaviour, do not code.* *If monitoring is of OUTCOME of behaviour, code* ***11, Self-monitoring of outcome(s) of behaviour.*** ***If unclear*** *whether monitoring is of behaviour or OUTCOME(S) of behaviour,* ***code 11, Self-monitoring of outcome(s) of behaviour.*** *If monitoring is by someone else (without feedback), code* ***12, Monitoring of behaviour by others without feedback****.*		IF1 IF3 IF4 IF5 IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
11.	***Self-monitoring of outcome(s) of behaviour***	Establish a method for the person to monitor and record the **outcome(s)** of their behaviour as part of a behaviour change strategy	*Ask the person to weigh themselves at the end of each day, over a two week period, and record their daily weight on a graph to increase exercise behaviours*	*If monitoring is only part of a data collection procedure rather than a strategy aimed at changing behaviour, do not code.* *If monitoring is of behaviour itself, code* ***10, Self-monitoring of behaviour.*** ***If unclear*** *whether monitoring is of behaviour or OUTCOME(S) of behaviour,* ***code 11, Self-monitoring of outcome(s) of behaviour.*** *If monitoring is by someone else (without feedback), code* ***13, Monitoring outcome(s) of behaviour by others without feedback.***		IF1 IF3 IF4 IF5 IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked interventi on functions*
12.	***Monitoring of behaviour by others without feedback***	Observe or record behaviour with the person's knowledge as part of a behaviour change strategy	Watch hand washing behaviours among health care staff and make notes on context, frequency and technique used	*If monitoring is part of a data collection procedure rather than a strategy aimed at changing behaviour, do not code* *If feedback is given, code only* ***8, Feedback on behaviour****, and not* ***12, Monitoring of behaviour by others without feedback****.* *If monitoring is of OUTCOME(S), code* ***13, Monitoring outcome(s) of behaviour by others without feedback****.* *If* ***unclear*** *whether monitoring is of behaviour or OUTCOME(S), code* ***13, Monitoring outcome(s) of behaviour by others without feedback****.* *If SELF-monitoring behaviour, code* ***10, Self-monitoring of behaviour***		IF3 IF4

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
13.	***Monitoring outcome(s) of behaviour by others without feedback***	Observe or record outcomes of behaviour with the person's knowledge as part of a behaviour change strategy.	*Record blood pressure, blood glucose, weight loss, or physical fitness*	*If monitoring is only part of a data collection procedure rather than a strategy aimed at changing behaviour, do not code.* *If feedback is given, code only* ***9, Feedback on outcome(s) of behaviour*** *If monitoring is of BEHAVIOUR code* ***12, Monitoring of behaviour by others without feedback****.* *If* ***unclear*** *whether monitoring is of behaviour or OUTCOME(S), code* ***13, Monitoring outcome(s) of behaviour by others without feedback****.* *If SELF-monitoring outcome(s), code* ***11, Self-monitoring of outcome(s) of behaviour***		IF3 IF4
14.	***Biofeedback***	Provide feedback about the body (e.g. physiological or biochemical state) using an external monitoring device as part of a behaviour change strategy	*Inform the person of their blood pressure reading to improve adoption of health behaviours*	*If Biofeedback ONLY, code only* ***14, Biofeedback*** *and not* ***8, Feedback on behaviour*** *or* ***9, Feedback on outcome(s) of behaviour***		IF1 IF2 IF3 IF4

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
Associations ***Making new associations between behaviour and cues or rewards, or managing existing such associations.***						
15.	***Prompts/cues***	Introduce or define an environmental or social stimulus* with the purpose of prompting or cueing the behaviour. The prompt or cue would normally occur at the time or place of performance.	*Put a sticker on the bathroom mirror to remind people to brush their teeth*	*When a stimulus* is linked to a specific action in an 'if-then' plan*, code only **64, Action planning**, and <u>not</u> **15, Prompts/cues.***		IF1 IF3 IF7
16.	***Reduce prompts/cues*** (includes '**fading'**)	Gradually withdraw prompts to perform the behaviour	*Reduce gradually the number of reminders used to take medication*			IF7
17.	***Cue signalling reward*** (includes '**discriminative cue'**)	Identify an environmental stimulus* that reliably predicts that reward will follow the behaviour	*Advise that a fee will be paid to dentists for a particular dental treatment of 6-8 year old children to encourage delivery of that treatment (the 6-8 year old children are the environmental stimulus*)*			IF1 IF3 IF7
18.	***Remove access to the reward*** (includes '**time out'**)	In order to reduce the behaviour, advise or arrange for the person to be separated from situations in which unwanted behaviour can be rewarded	*Arrange for cupboard containing high calorie snacks to be locked for a specified period to reduce the consumption of sugary foods in between meals*			IF4 IF7
19.	***Remove aversive stimulus**** (includes ***'Escape learning'***)	Advise or arrange for the removal of an aversive stimulus* to facilitate behaviour change	*Arrange for a gym-buddy to stop nagging the person to do more exercise in order to increase the desired exercise behaviour*			IF3 IF7
20.	***Satiation***	Advise or arrange repeated exposure to a stimulus* that reduces or extinguishes a drive for the unwanted behaviour	*Arrange for the person to eat large quantities of chocolate, in order to reduce the person's appetite for sweet foods*			IF1 IF7

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
21.	***Exposure***	Provide systematic confrontation with a feared stimulus* to reduce the response to a later encounter	*Agree a schedule by which the person will e.g. make a telephone call to their boss, spend an evening without snacking*			IF7
22.	***Associative learning*** (includes '**Classical conditioning', 'Pavlovian conditioning'**)	Present a neutral stimulus* jointly with a stimulus* that already elicits the behaviour repeatedly until the neutral stimulus* elicits that behaviour	*Repeatedly present fatty foods with a disliked flavoured sauce to discourage the consumption of fatty foods*	*When a BCT involves reward or punishment, do <u>not</u> code **22, Associative learning***		IF7
Repetition and substitution ***Practising, rehearsing or repeating a behaviour, or directly replacing a new wanted behaviour for an existing unwanted behaviour***						
23.	***Behavioural practice/ rehearsal***	Prompt practice or rehearsal of the performance of the behaviour one or more times in a context or at a time when the performance may not be necessary, in order to increase habit and skill	*Prompt asthma patients to measure their peak flow regularly*	*If aiming to associate performance with the context, <u>also</u> code **24, Habit formation***	**24**? (see notes)	IF5
24.	***Habit formation***	Prompt rehearsal and repetition of the behaviour in the same context repeatedly so that the context elicits the behaviour	*Prompt patients to always take their statin tablet before brushing their teeth in the evening*		**23**	IF5
25.	***Behaviour substitution***	Prompt substitution of the unwanted behaviour with a wanted or neutral behaviour	*Suggest that the person carries a piece of fruit to eat instead of biscuits or cake if they are offered them*	*If substitution occurs regularly, <u>also</u> code **26, Habit reversal***	**26**? (see notes)	IF9
26.	***Habit reversal***	Prompt rehearsal and repetition of an alternative behaviour to **replace** an unwanted habitual behaviour	*Ask the person to walk up stairs every time they consider taking a lift or escalator*		**25**	IF5
27.	***Overcorrection***	Ask to repeat the wanted behaviour in an exaggerated way following an unwanted behaviour	*Ask to eat only fruit and vegetables the day after a poor diet*			IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
28.	***Generalisation of a target behaviour***	Advise to perform the wanted behaviour already performed in a particular situation, in another situation	*Advise to repeat toning exercises learned in the gym when at home*			IF9
29.	***Graded tasks***	Set easy-to-perform tasks, making them increasingly difficult, but achievable, until behaviour is performed	*Ask the person to walk for 100 yards a day for the first week, then half a mile a day after they have successfully achieved 100 yards, then two miles a day after they have successfully achieved one mile*			IF5 IF9
Antecedents* ***Managing the social and environmental situations and events, emotions, or thoughts that elicit an existing unwanted behaviour, or have the potential to elicit a new wanted behaviour.***						
30.	***Restructuring the physical environment***	Change, or advise to change the physical environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour (other than prompts/cues, rewards and punishments)	*Advise to keep biscuits and snacks in a cupboard that is inconvenient to get to*	*This may also involve **32, Avoidance/reducing exposure to cues for the behaviour**.* *If restructuring of the SOCIAL environment code **31, Restructuring the social environment***	**32**? (see notes)	IF7 IF9
31.	***Restructuring the social environment***	Change, or advise to change the social environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour (other than prompts/cues, rewards and punishments)	*Advise to minimise time spent with friends who drink heavily to reduce alcohol consumption*	*This may also involve **32, Avoidance/reducing exposure to cues for the behaviour**.* *If restructuring of the PHYSICAL environment code **30, Restructuring the physical environment***	**32**? (see notes)	IF7 IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
32.	***Avoidance/reducing exposure to cues for the behaviour***	Advise on how to avoid exposure to specific social and contextual/physical cues for the behaviour, including changing daily or weekly routines	*Suggest to a person who wants to quit smoking that their social life focus on activities other than pubs and bars which have been associated with smoking*	*This may also involve **30, Restructuring the physical environment*** and/or ***31, Restructuring the social environment**.* *If the BCT includes analysing the behavioural problem, only code **61, Problem solving.***	**30**? **31**? (see notes)	IF9
33.	***Distraction***	Advise or arrange to use an alternative focus for attention to avoid triggers for unwanted behaviour	*Suggest to a person who is trying to avoid between-meal snacking to focus on a topic they enjoy (e.g. holiday plans) instead of focusing on food when they are feeling hungry*			IF9
34.	***Adding objects to the environment***	Add objects to the environment in order to facilitate performance of the behaviour	*Provide free condoms to facilitate safe sex* *Provide attractive toothbrush to improve tooth brushing technique*	*If this is accompanied by social support, also code **1, Social support (practical)**.* *If the environment is changed beyond the addition of objects, also code **30, Restructuring the physical environment***	**1**? **30**? (see notes)	IF7 IF9
35.	***Body changes***	Alter body structure, functioning or support **directly** to facilitate behaviour change	*Prompt strength training, relaxation training or provide assistive aids*			IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
Shaping knowledge ***Providing information, instructions, or explanations around the behaviour.***						
36.	***Instruction on how to perform a behaviour*** (includes '**Skills training**')	Advise or agree on how to perform the behaviour	*Advise the person how to put a condom on a model of a penis correctly*	*When the person attends classes such as exercise or cookery, code **36, Instruction on how to perform the behaviour, 23, Behavioural practice/rehearsal** <u>and</u> **84, Demonstration of the behaviour***	**36**? **23**? **84**? (see notes)	IF5
37.	***Information about antecedents****	Provide information about antecedents* that reliably predict performance of the behaviour	*Advise to keep a record of snacking and of situations or events occurring prior to snacking*			IF1
38.	***Re-attribution***	Elicit perceived causes of behaviour and suggest alternative explanations *(e.g. external or internal and stable or unstable)*	*If the person attributes their over-eating to the frequent presence of delicious food, suggest that the 'real' cause may be the person's inattention to bodily signals of hunger and satiety*			IF1 IF2
39.	***Behavioural experiments***	Advise on how to identify and test hypotheses about the behaviour, its causes and consequences, by collecting and interpreting data	*Ask a family physician to give evidence-based advice rather than prescribe antibiotics and to note whether the patient is grateful or annoyed*			IF1 IF5 IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
Self-belief ***Fostering confidence in one's ability to perform the behaviour.***						
40.	***Verbal persuasion about capability***	Tell the person that they can successfully perform the wanted behaviour, arguing against self-doubts and asserting that they can and will succeed	*Tell the person that they can successfully increase their frequency of physical activity, arguing against self-doubts and asserting that they can and will succeed*	*There is a distinction between* ***89, Vicarious consequences,*** *and* ***40, Verbal persuasion about capability****: 40 is NOT about the consequences of performing the behaviour*		IF2 IF9
41.	***Mental rehearsal of successful performance***	Advise to practise imagining performing the behaviour successfully in relevant contexts	*Advise to imagine eating a salad in a work canteen*			IF5 IF9
42.	***Focus on past success***	Advise to think about or list previous successes in performing the behaviour (or parts of it)	*Advise to describe or list the occasions on which a doctor advised a patient with acute low back pain to stay active to manage this condition*			IF2 IF9
43.	***Self-talk***	Prompt positive self-talk (aloud or silently) before and during the behaviour	*Prompt the person to tell themselves that a walk will be energising*			IF5 IF9
Scheduled consequences ***Emphasising or changing rewards or punishments arising from the behaviour.***						
44.	***Punishment***	Identify and provide aversive consequence contingent on the performance of the unwanted behaviour	*Arrange for the person to wear unattractive clothes following consumption of fatty foods*			IF4
45.	***Behaviour cost*** (includes **'response cost'**)	Withdraw something valued (not a contingent reward) if and only if an unwanted behaviour is performed	*Subtract money from a prepaid refundable deposit when a cigarette is smoked*			IF4

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
46.	***Remove reward*** (includes '**extinction'**)	Discontinue contingent reward for performing the unwanted behaviour	*Arrange for the other people in the household to ignore the person every time they eat chocolate (rather than attending to them by criticising or persuading)*			IF4
47.	***Reward approximation*** (includes '**shaping'**)	Reward any approximation to the target behaviour, gradually rewarding only performance closer to the wanted behaviour	*Arrange for or reward the person for any reduction in daily calories, gradually requiring the daily calorie count to become closer to the planned calorie intake*		**54** or **55** or **56** or **57**	IF3
48.	***Rewarding completion*** (includes '**backward chaining'**)	Build up behaviour by rewarding final component of the behaviour; gradually add the components of the behaviour that occur earlier in the behavioural sequence	*Reward eating a supplied low calorie meal; then make reward contingent on cooking and eating the meal; then make reward contingent on purchasing, cooking and eating the meal*		**54** or **55** or **56** or **57**	IF3
49.	***Situation-specific reward*** (includes '**discrimination training'**)	Reward the behaviour in one situation but not in another.	*Arrange for or reward eating sweet foods at mealtimes but not between meals*		**54** or **55** or **56** or **57**	IF3
50.	***Reward incompatible behaviour*** (includes '**counter-conditioning'**)	Reward for responding to a stimulus* in a manner that is incompatible with a previous response to that stimulus*	*Arrange for or reward the person for ordering a soft drink at the bar rather than an alcoholic beverage*		**54** or **55** or **56** or **57**	IF3

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
51.	***Reward alternative behaviour*** (includes '**differential reinforcement'**)	Arrange reward for performance of an alternative to the unwanted behaviour *Note: consider also coding **61, Problem solving***	*Reward for consumption of low fat foods but not consumption of high fat foods*		**54** or **55** or **56** or **57** **61**?	IF3
52.	***Reduce reward frequency*** (includes '**thinning'**)	Arrange for rewards to be made contingent on increasing duration or frequency of the behaviour	*Arrange for or reward for each day without smoking, then each week, then each month, then every 2 months and so on*		**54** or **55** or **56** or **57**	IF3
53.	***Remove punishment*** (includes '**negative reinforcement'**)	Arrange for removal of an unpleasant consequence contingent on performance of the wanted behaviour	*Arrange for someone else to do housecleaning only if the person has adhered to the medication regimen for a week*			IF3
Reward and threat ***Rewarding or punishing new or old behaviours.***						
54.	***Material reward for behaviour*** (includes **'positive reinforcement'**)	Arrange for the delivery of money, vouchers or other valued objects if and only if there has been effort and/or progress made towards performing the behaviour	*Arrange for the person to receive money that would have been spent on cigarettes if and only if the smoker has not smoked for one month*	*If the reward is social, code **56, Social reward.*** *If the reward is unspecified code **57, Non-specific reward**, and <u>not</u> **54, Material reward (behaviour)*** *If the reward is for **outcome**, code **55, Material reward (outcome)***		IF3

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
55.	***Material reward for outcome*** (includes '**positive reinforcement**')	Arrange for the delivery of a reward if and only if there has been effort and/or progress made towards achieving the behavioural **outcome**	*Arrange for the person to receive money if and only if a certain amount of weight is lost*	*This includes social, material, self- and non-specific rewards for outcome.* *If reward is for the BEHAVIOUR code **56**, **Social reward**, or **54 Material reward (behaviour)**, or **57 Non-specific reward** or **58**, **Self-reward,** and <u>not</u> **55, Material reward (outcome)***		IF3
56.	***Social reward*** (includes '**positive reinforcement**')	Arrange verbal or non-verbal reward if and only if there has been effort and/or progress made towards performing the behaviour	*Congratulate the person for each day they eat a reduced fat diet*	*If reward is material, code **54, Material reward (behaviour)**, and <u>not</u> **56, Social reward*** *If reward is unspecified code **57, Non-specific reward**, and <u>not</u> **56, Social reward*** *If reward is for OUTCOME, code **55, Material reward (outcome)***		IF3

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
57.	***Non-specific reward*** (includes '**positive reinforcement'**)	Arrange delivery of a reward if and only if there has been effort and/or progress made towards performing the behaviour	*Identify something (e.g. an activity such as a visit to the cinema) that the person values and arrange for this to be delivered if and only if they attend for health screening*	*If reward is material, code **54, Material reward (behaviour)**, and <u>not</u> **57, Non-specific reward*** *If reward is social, code **56, Social reward**, and <u>not</u> **57, Non-specific reward*** *If reward is for **outcome** code **55, Material reward (outcome)***		IF3
58.	***Self-reward***	Prompt self-praise or self-reward if and only if there has been effort and/or progress made towards the behaviour	*Encourage to reward self with material (e.g., new clothes) or other valued objects if and only if they have adhered to a healthy diet*	*If self-reward is material, <u>also</u> code **54, Material reward (behaviour)*** *If self-reward is social, <u>also</u> code **56, Social reward*** *If self-reward is unspecified, <u>also</u> code **57, Non-specific reward*** *If reward is for **outcome** code **55, Material reward (outcome)***	**54**? **56?** **57?** (see notes)	IF3 IF5 IF9
59.	***Future punishment*** (includes '**threat'**)	Inform that future punishment or removal of reward will be a consequence of performance of an unwanted behaviour (may include fear arousal)	*Inform that continuing to consume 30 units of alcohol per day is likely to result in liver disease and early death*			IF4

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
60.	***Incentive***	Inform that future rewards or removal of future punishment will be contingent on performance of behaviour	*Ask the person to make a financial deposit at the beginning of the intervention and promise to give this money back on achievement of specified, agreed behavioural targets* *Inform that a financial payment will be made each month in pregnancy that the woman has not smoked*			IF3
Goals and planning ***Managing behaviour or outcome goals, and/or how behaviour or outcomes will be achieved***						
61.	***Problem solving*** (includes '**relapse prevention'** and '**coping planning'**)	Analyse factors influencing the behaviour and generate or select strategies that include overcoming barriers and/or increasing facilitators	*Identify specific triggers (e.g. being in a pub, feeling anxious) that generate the urge/want/need to drink and develop strategies for avoiding environmental triggers or for managing negative emotions, such as anxiety, that motivate drinking*	*Barrier identification without solutions is NOT sufficient.* *If the BCT does NOT include analysing the behavioural problem, consider* ***32, Avoidance/changing exposure to cues for the behaviour, 30, Restructuring the physical environment, 31, Restructuring the social environment,*** *or* ***5, Reduce negative emotions***		IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
62.	***Goal setting (behaviour)***	Set or agree a goal defined in terms of the behaviour to be achieved	*Invite the person to propose a daily walking goal (e.g. to walk for at least 30 minutes every day) and reach agreement about the goal* *Set the goal of eating 5 pieces of fruit per day as specified in public health guidelines*	*Only code guidelines if set as a goal in an intervention context.* *If goal is unspecified or is a behavioural outcome, code* ***63, Goal setting (outcome)*** *If the goal defines a specific context, frequency, duration or intensity for the behaviour, also code* ***64, Action planning***	**64**? (see notes)	IF9
63.	***Goal setting (outcome)***	Set or agree a goal defined in terms of a positive **outcome** of wanted behaviour	*Invite the person to set a weight loss goal (e.g. 0.5 kilogram over one week) as an outcome of changed eating patterns*	*Only code guidelines if set as a goal in an intervention context* *If goal is a behaviour, code* ***62, Goal setting (behaviour)*** *If goal is unspecified code* ***63, Goal setting (outcome)***		IF9
64.	***Action planning*** (includes **'implementation intentions'**)	Prompt detailed planning of performance of the behaviour (must include at least one of context, frequency, duration and intensity). Context may be environmental (physical or social) or internal (physical, emotional or cognitive)	*Following prompting, plan to carry condoms when going out socially at weekends* *Plan the performance of a particular physical activity (e.g. running) at a particular time (e.g. before work) on certain days of the week*	*Evidence of action planning does not necessarily imply goal setting. Only code goal setting if sufficient evidence*		IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
65.	***Review behaviour goal(s)***	Review behaviour goal(s) jointly with the person and consider modifying goal(s) or behaviour change strategy in light of achievement. This may lead to re-setting the same goal, a small change in that goal or setting a new goal instead of, or in addition to, the first	*Review how well a person's performance corresponds to agreed goals e.g. whether they consumed less than one unit of alcohol per day, and consider modifying future behavioural goals accordingly e.g. by increasing or decreasing alcohol target or changing type of alcohol consumed*	*If goal is specified in terms of behaviour, code **65, Review behaviour goal(s)*** *If goal is unspecified, code **66, Review outcome goal(s)*** *If discrepancy is created consider also **69, Discrepancy between current behaviour and goal***	**69**? (see notes)	IF9
66.	***Review outcome goal(s)***	Review outcome goal(s) jointly with the person and modify goal(s) or behaviour change strategy in light of achievement. This may lead to re-setting the same goal, a small change in that goal or setting a new goal instead of, or in addition to the first	*Review how much weight has been lost and consider modifying outcome goal(s) accordingly e.g., by increasing or decreasing subsequent weight loss targets*	*If goal is specified in terms of behaviour, code **65, Review behaviour goal(s)*** *If goal is unspecified, code **66, Review outcome goal(s)*** *If discrepancy created consider also **69, Discrepancy between current behaviour and goal***	**69**?	IF9
67.	***Behavioural contract***	Create a written specification of the behaviour to be performed, agreed by the person, and witnessed by another	*Sign a contract with the person e.g. specifying that they will not drink alcohol for one week*		**62**	IF3 IF4 IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked interventi on functions*
68.	***Commitment***	Ask the person to make statements indicating strong commitment to change the behaviour	*Ask the person to use an "I will" statement to affirm or reaffirm a strong commitment (i.e. using the words "strongly", "committed" or "high priority") to start, continue or restart the attempt to reduce alcohol use*	*If defined in terms of the behaviour to be achieved also code* ***62, Goal setting (behaviour)***	**62**? (see notes)	IF3 IF4 IF9
69.	***Discrepancy between current behaviour and goal***	Draw attention to discrepancies between a person's current behaviour (in terms of the *form, frequency, duration, or intensity* of that behaviour) and the person's previously set outcome goals, behavioural goals or action plans (goes beyond self-monitoring of behaviour)	*Point out that the recorded exercise fell short of the goal set*	*If discomfort is created only code* ***76, Incompatible beliefs*** *and not* ***69, Discrepancy between current behaviour and goal*** *If goals are modified, also code* ***65, Review behaviour goal(s)*** *and/or* ***66, Review outcome goal(s)*** *If feedback is provided, also code* ***8, Feedback on behaviour***	**65**? **66**? **8**? (see notes)	IF3 IF4 IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
Comparison of outcomes ***Considering relative pros and cons of outcomes of various behaviours***						
70.	***Persuasive source***	Present verbal or visual communication from a **credible source** in favour of or against the behaviour	*Present a speech given by a high status professional to emphasise the importance of not exposing patients to unnecessary radiation by ordering x-rays for back pain*	*Code this BCT only if source generally agreed on as credible e.g., health professionals, celebrities or words are used to indicate expertise or leader in field.* *If information about health consequences, also code* ***78, Information about health consequences*** *If information about emotional consequences, also code* ***79, Information about emotional consequences*** *If information about social, environmental or unspecified consequences also code* ***80, Information about social and environmental consequences***	**78**? **79**? **80**? (see notes)	IF2

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
71.	***Pros and cons***	Advise the person to identify and compare reasons for wanting (discuss) and not wanting to (cons) change the behaviour	*Advise the person to list and compare the advantages and disadvantages of prescribing antibiotics for upper respiratory tract infections*	*If information about health consequences, <u>also</u> code **78, Information about health consequences*** *If information about emotional consequences, <u>also</u> code **79, Information about emotional consequences*** *If information about social, environmental or unspecified consequences <u>also</u> code **80, Information about social and environmental consequences***	**78**? **79**? **80**? (see notes)	IF9
72.	***Comparative imagining of future outcomes***	Prompt or advise the imagining and comparing of future outcomes of changed versus unchanged behaviour	*Prompt the person to imagine and compare likely or possible outcomes following attending versus not attending a screening appointment*			IF9
Identity ***Managing how one sees, thinks or feels about oneself or the behaviour.***						
73.	***Identification of self as role model***	Inform that one's own behaviour may be an example to others	*Inform the person that healthy eating may be a good example for their children*			IF2 IF9
74.	***Valued self-identity*** (includes **'Self-affirmation')**	Advise the person to write or complete rating scales about a cherished value or personal strength as a means of affirming the person's identity as part of a behaviour change strategy	*Advise the person to write about their personal strengths before they receive a message advocating the behaviour change*			IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
75.	***Framing/ reframing*** (includes '**cognitive structuring**')	Suggest the deliberate adoption of a perspective or new perspective on behaviour in order to change cognitions or emotions about performing the behaviour	*Suggest that the person might reduce sedentary behaviour (rather than increasing activity)*			IF2 IF9
76.	***Incompatible beliefs*** (includes '**cognitive dissonance**')	Draw attention to discrepancies between current or past behaviour and self-image, in order to create discomfort	*Draw attention to a critical care consultant's liberal use of blood transfusion and their self-identification as a proponent of evidence-based medical practice*			IF4 IF9
77.	***Identity associated with changed behaviour***	Advise the person to construct a new self-identity as someone who 'used to engage with the unwanted behaviour'	*Ask the person to articulate their new identity as an 'ex-smoker'*			IF2 IF9
Natural consequences ***Providing information about the naturally-occurring consequences of the behaviour.***						
78.	***Information about health consequences***	Provide information about health consequences of performing the behaviour	*Explain that not finishing a course of antibiotics can increase susceptibility to future infection* *Present the likelihood of contracting a sexually transmitted infection following unprotected sexual behaviour*	*Consequences can be for any target, not just the recipient(s) of the intervention.* *If information about emotional consequences, code **79, Information about emotional consequences*** *If information about social, environmental or unspecified consequences code **80, Information about social and environmental consequences***		IF1 IF2

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
79.	***Information about emotional consequences***	Provide information about emotional consequences of performing the behaviour	*Explain that quitting smoking increases happiness and life satisfaction*	*Excludes* ***83, Anticipated regret*** *Consequences can be for any target, not just the recipient(s) of the intervention* *If information about health consequences code* ***78, Information about health consequences*** *If information about social, environmental or unspecified code* ***80, Information about social and environmental consequences***	Do not code **83**	IF1 IF2

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
80.	***Information about social and environmental consequences***	Provide information about social and environmental consequences of performing the behaviour	*Tell family physician about financial remuneration for conducting health screening*	*Consequences can be for any target, not just the recipient(s) of the intervention* *If information about health or consequences, code **78, Information about health consequences*** *If information is about emotional consequences, code **79, Information about emotional consequences*** *If information is unspecified, code **80, Information about social and environmental consequences***		IF1 IF2
81.	***Salience of consequences***	Use methods to emphasise (make more memorable) the consequences of changing the behaviour (goes beyond informing about consequences)	*Produce cigarette packets showing pictures of health consequences e.g. diseased lungs*			IF2 IF9
82.	***Monitoring of emotional consequences***	Prompt assessment of **feelings** after attempts at performing the behaviour	*Agree that the person will record how they feel after e.g., taking their daily walk*			IF9
83.	***Anticipated regret***	Induce expectations of future regret about performance of the unwanted behaviour *Note: <u>not</u> including **79, Information about emotional consequences***	*Ask the person to assess the degree of regret they will feel if they do not quit smoking (e.g. on a 5 point scale)*			IF4 IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
Comparison of behaviour ***Comparing own behaviour to an ideal performance or to others' beliefs or behaviour***						
84.	***Demonstration of the behaviour*** (includes '**modelling**')	Provide an example of the behaviour being performed for the person to aspire to or imitate	*Demonstrate to nurses how to raise the issue of excessive drinking with patients via a role-play exercise*			IF8
85.	***Social comparison***	Draw attention to others' performance to explicitly elicit comparisons	*Show the general practitioner the proportion of patients who were prescribed antibiotics for a common cold by themselves and by their colleagues*	*Being in a group setting does not necessarily mean that social comparison is actually taking place.*		IF2
86.	***Information about others' approval***	Provide information about what other people think about the behaviour. The information clarifies whether others will like, approve or disapprove of what the person is doing or will do	*Tell the staff at the hospital ward that staff at all other wards approve of washing their hands according to the guidelines*			IF1 IF2
Covert learning ***Imagining consequences of behaviour, or observing consequences of the behaviour for others.***						
87.	***Imaginary punishment*** (includes '**covert sensitisation**')	Advise to imagine performing the **unwanted** behaviour in a real-life situation followed by imagining an unpleasant consequence	*Advise to imagine overeating and then vomiting*			IF4 IF9
88.	***Imaginary reward*** (includes '**covert conditioning**')	Advise to imagine performing the **wanted** behaviour in a real-life situation followed by imagining a pleasant consequence	*Advise the health professional to imagine giving dietary advice followed by the patient losing weight and no longer being diabetic*			IF3 IF9

No.	Label	Definition	Examples	Notes	Also code	*Linked intervention functions*
89.	***Vicarious consequences***	Prompt observation of the consequences (including rewards and punishments) for others when they perform the behaviour	*Draw attention to the positive comments other staff get when they disinfect their hands regularly*	*If observation of health consequences, also code **78, Information about health consequences*** *If observation of emotional consequences, <u>also</u> code **79, Information about emotional consequences*** *If observation of social, environmental or unspecified consequences, <u>also</u> code **80, Information about social and environmental consequences***	**78**? **79**? **80**? (see notes)	IF9

*** Glossary of key terms**
Antecedents: the social and environmental situations and events, emotions, or thoughts that precede, cause or elicit an existing unwanted behaviour, or have the potential to precede, cause or elicit a new wanted behaviour.
'If-then' plan: A detailed plan which specifies what action will be taken when a specific context or stimulus* is encountered (i.e. 'if I finish using the toilet, then I will wash my hands').
Stimulus*: Anything (e.g. a thing, event, situation, etc.) that evokes a response, or has the potential to do so.

2. Intervention function coding structure

The table below is adapted from the 'Behaviour Change Wheel' (Michie, van Stralen & West, 2011). It aims to provide a comprehensive overview of the possible functions of behaviour change interventions.

Code	*Intervention function*	*Definition*	*Example of intervention function*	*NOT an example of intervention function*
IF1	**Education**	Increasing knowledge or understanding	*Providing information to promote healthy eating*	Providing cooking lessons *(this is **training** as the aim is to impart skill rather than increase knowledge)*
IF2	**Persuasion**	Using communication to induce positive or negative feelings, or to stimulate action	*Using imagery to motivate increases in physical activity*	Providing information on benefits of physical activity *(this is **education** as the aim is to increase knowledge about the impact of physical activity)*
IF3	**Incentivisation**	Creating an expectation of reward	*Using prize draws to induce attempts to stop smoking*	Using positive images of non-smokers to encourage smokers to quit *(this is **persuasion** as there is no direct reward)*
IF4	**Coercion**	Creating an expectation of punishment or cost	*Raising the financial cost to reduce excessive alcohol consumption*	Telling drinkers if they drink to excess they will be viewed negatively by their peers *(this is **persuasion** not coercion as there is no direct punishment or cost to the drinker)*
IF5	**Training**	Imparting skills for performing the target behaviour	*Advanced driver training to increase safe driving*	A lecture about safe driving *(this is **education** as the aim is to impart knowledge, i.e. the what not the practical application of this knowledge, i.e. the how to that defines training)*
IF6	**Restriction**	Using rules to reduce the opportunity to engage in the target behaviour (or to increase the target behaviour by reducing the opportunity to engage in competing behaviours)	*Prohibiting sales of solvents to people under 18 to reduce use for intoxication*	Fines for the possession of solvents *(this is **coercion** as there is a cost for the undesirable behaviour)*
IF7	**Environmental restructuring**	Changing the physical or social context in which the behaviour is (or could be) performed	*Providing on-screen prompts for GPs to ask about smoking behaviour*	Creating a rewards system for GPs who ask about smoking behaviour *(this is **incentivisation** as there is a reward for the desirable behaviour)*

Code	*Intervention function*	*Definition*	*Example of intervention function*	*NOT an example of intervention function*
IF8	**Modelling**	Providing an example for people to aspire to or imitate	*Using TV drama scenes involving safe-sex practices to increase condom use*	Using TV advert to encourage condom use *(this is **persuasion** as the aim is to induce positive feelings towards condom use)*
IF9	**Enablement**	Increasing means/reducing barriers to increase capability **(beyond *education* and/or *training*)** or opportunity **(beyond *environmental restructuring*)**	*Behavioural support for smoking cessation, medication for cognitive deficits, surgery to reduce obesity, prostheses to promote physical activity*	Supporting GPs to recognise the symptoms ovarian cancer with an information pamphlet *(this is **education** as the primary aim is to inform rather than support)*