Reminder systems for women with previous gestational diabetes mellitus to increase uptake of testing for type 2 diabetes or impaired glucose tolerance (Protocol)

Middleton P, Crowther CA

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Reminder systems for women with previous gestational diabetes mellitus to increase uptake of testing for type 2 diabetes or impaired glucose tolerance (Protocol)

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Reminder systems for women with previous gestational diabetes mellitus to increase uptake of testing for type 2 diabetes or impaired glucose tolerance

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ABSTRACT

This is the protocol for a review and there is no abstract. The objectives are as follows:

To assess the effects of reminder systems to increase uptake of testing for type 2 diabetes or impaired glucose tolerance in women with a history of gestational diabetes mellitus.

BACKGROUND

Description of the condition

Diabetes mellitus is a metabolic disorder resulting from a defect in insulin secretion, insulin action, or both. A consequence of this is chronic hyperglycaemia (that is elevated levels of plasma glucose) with disturbances of carbohydrate, fat and protein metabolism. Long-term complications of diabetes mellitus include retinopathy, nephropathy and neuropathy. The risk of cardiovascular disease and cancer is increased. For a detailed overview of diabetes mellitus, please see under 'Additional information' in the information on the Metabolic and Endocrine Disorders Group in The Cochrane Library (see 'About', 'Cochrane Review Groups (CRGs)'). For an explanation of methodological terms, see the main glossary in The Cochrane Library.

Being pregnant is a state that creates a degree of metabolic stress such as increased insulin resistance (Ratner 2007). For some women this results in glucose concentrations high enough for a diagnosis of gestational diabetes mellitus (GDM) to be made. Although these high glucose concentrations usually normalise immediately after birth, women who have experienced GDM are at increased risk of developing type 2 diabetes in the future (Conway 1999; Hunt 2008; Retnakaran 2008; Retnakaran 2011; Schaefer-Graf 2002). Both GDM and type 2 diabetes share the two main metabolic defects of insulin resistance and ß-cell dysfunction (Retnakaran 2008). In fact GDM could be regarded as "type 2 diabetes unmasked by pregnancy" (Bottalico 2007). Approximately 7% of pregnancies in the USA are complicated by
GDM (Nicholson 2008), partly due to increasing rates of obesity (Kim 2010). In Australia, the prevalence of GDM is 5% (AIHW 2010).

It is important to note that the prevalence of GDM is influenced by methods of detection and diagnosis which differ across the world (ACOG 2011). For example, the recent Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) study deliberations suggest lowering the diagnostic threshold, which would result in 18% of pregnancies being diagnosed with GDM (Metzger 2010), nearly trebling the yield of many current methods of diagnosing GDM. Because of these variations, a standard set of diagnostic criteria cannot be applied for identifying women with GDM.

Women who have experienced GDM are over seven times more likely to develop type 2 diabetes compared with women with normal glycaemic concentrations in pregnancy (Bellamy 2009). Cumulative incidence rates of type 2 diabetes range from 30% to 62% in the first five years after giving birth for a woman with previous GDM, and appear to plateau after 10 years (Kim 2002). Risk of developing type 2 diabetes is proportional to the degree of hyperglycaemia during pregnancy (Rettakaran 2008), with factors such as impaired glucose tolerance, needing insulin to manage GDM, pre-pregnancy obesity, HDL-cholesterol less than 50 mg/dl and age older than 35 years being predictors of diabetes after GDM (Göbl 2011; Nicholson 2008). In addition to increased risk of later type 2 diabetes, women diagnosed with GDM are also at increased risk of recurrent GDM in subsequent pregnancies. Rates of GDM recurrence range from 36% to 70%, with some of these cases likely to be unrecognised (pregestational) type 2 diabetes (Bottalico 2007).

Description of the intervention

Many international professional and government clinical practice guidelines or consensus statements recommend that women who had GDM in their most recent pregnancy receive an oral glucose tolerance test (OGTT) between six to 12 weeks postpartum to detect type 2 diabetes (ACOG 2009; Berger 2002; Metzger 2007; RANZCOG 2008; Simmons 2002). Because of the high risk of future diabetes, these women are often advised to be re-tested on a regular basis (Metzger 2007; NICE 2008; RANZCOG 2008; Simmons 2002).

There is a large gap between these recommendations for postpartum testing and practice. Even though a history of gestational diabetes provides a natural prompt to commence screening for type 2 diabetes (Bellamy 2009), most women are not tested. Rates vary from 5% to 60%, with probably only 20% to 40% of women with previous GDM having some form of postpartum glucose test (Clark 2009; Conway 1999).

Reasons given for not having a postpartum OGTT include a perception that GDM resolves completely after pregnancy; the emotional stress and time demands of a new baby, the inconvenience of the test and fear of receiving a diagnosis of diabetes as well as lack of continuity of postpartum care (Bennett 2011; Hunt 2008; Keely 2010).

Reminder systems have been shown to be effective in many areas of health care, including diabetes (Weingarten 2002) although not specifically in pregnant or postpartum women with diabetes or a history of diabetes. Systematic reviews have demonstrated that clinician reminders can modestly increase rates of preventative care (Dexheimer 2008) and health care performance in general (Grimshaw 2006). Thus reminder systems for women or health professionals (or both) may increase the uptake of postpartum glucose tests. Preventative care reminders have usually been in the form of mailed letters or direct phone calls, with email and mobile phone (SMS: short message service) messaging now beginning to be used (Atherton 2009; Car 2008).

A voluntary national Gestational Diabetes Register, recently been established in Australia (http://www.ndss.com.au), will issue annual reminders to women who have experienced GDM and joined the scheme. An evaluation of its predecessor, the South Australian Gestational Diabetes Mellitus Recall Register, indicates the potential of registration and follow-up reminders to increase the uptake of glucose tests and therefore early detection of type 2 diabetes (Chittleborough 2010).

Adverse effects of the intervention

While a reminder intervention is not envisaged to lead to adverse effects, there is the possibility that reminders may be regarded as intrusive by some people and may even be a source of anxiety.

How the intervention might work

The purpose of postpartum screening of women with previous GDM is to promptly identify women who will subsequently develop type 2 diabetes. Early identification allows earlier management through preventative strategies such as diet modification, exercise and avoiding excessive weight gain (Nielen 2008; Norris 2005; Orozco 2008). Sometimes oral glucose lowering drugs or insulin may be added to ‘lifestyle’ changes. In a subgroup analysis of the Diabetes Prevention Program, both intensive lifestyle interventions and metformin were effective in delaying or preventing diabetes in women with impaired glucose tolerance and a history of GDM (Ratner 2008).

However the beneficial effects of these preventive measures will not be realised unless women with previous gestational diabetes are screened postpartum, are offered appropriate management and follow-up, and then agree to make lifestyle changes. Clinicians and women regard reminder systems for postpartum type 2 diabetes screening as important and useful (Keely 2010) and so reminders are likely to be able to address some of the awareness and behavioural barriers for both women and their clinicians, leading to women with a history of gestational diabetes being able to avoid a diagnosis of type 2 diabetes in the future.
Why it is important to do this review

The incidence of gestational diabetes indicates the underlying frequency of type 2 diabetes, with both types of diabetes rising throughout the world (Bellamy 2009). The early postpartum period is an important time to identify risk of diabetes in women with a history of GDM or milder glucose intolerance in pregnancy (Retnakaran 2008). For a majority of such women, this opportunity is currently missed and so is the chance to detect any problems and intervene to prevent future diabetic complications such as cardiovascular disease (Kitzmiller 2007; Shah 2008) and also to reduce risks of diabetes in their children (Dabelea 2011).

This review will evaluate the effects of reminder strategies so all possible women can be identified, followed up and offered appropriate management and treatments. A Cochrane review assessing the effects of interventions to prevent type 2 diabetes in women with previous gestational diabetes is currently being prepared (Wendland 2011).

OBJECTIVES

To assess the effects of reminder systems to increase uptake of testing for type 2 diabetes or impaired glucose tolerance in women with a history of gestational diabetes mellitus.

METHODS

Criteria for considering studies for this review

Types of studies
Randomised controlled clinical trials.

Types of participants
Women with a diagnosis of gestational diabetes mellitus (GDM) in the index pregnancy.

Diagnostic criteria
To be consistent with changes in classification and diagnostic criteria of diabetes mellitus through the years, the diagnosis should be established using the standard criteria valid at the time of the beginning of the trial (for example ADA 1999; ADA 2008; WHO 1998). Ideally, diagnostic criteria should have been described. If necessary, we will use authors’ definition of diabetes mellitus. We plan to subject diagnostic criteria to a sensitivity analysis.

Types of interventions

Intervention
- reminders of any modality (post, email, phone (direct call or short SMS (short message service) text)) to either women with a history of GDM or health professionals or both

Control
- a different kind of reminder;
- no reminder.

Types of outcome measures

Primary outcomes
- proportion of women having their first OGTT after giving birth (> six weeks to \(\leq\) six months; > six months to \(\leq\) 12 months; > 12 months);
- proportion of women having a blood glucose test other than an OGTT after giving birth (> six weeks to \(\leq\) six months; > six months to \(\leq\) 12 months, > 12 months);
- proportion of women diagnosed with type 2 diabetes or showing impaired glucose tolerance or impaired fasting glucose after giving birth;
- health-related quality of life.

Secondary outcomes
- diabetes-associated morbidity;
- death from any cause;
- adverse events;
- blood glucose concentrations;
- glycosylated haemoglobin A1c (HbA1c) values;
- appropriate referral and/or management;
- GDM recurrence in the next or any subsequent pregnancy;
- depression or depressive symptoms, anxiety, distress (as reported by authors);
- self-reported ‘lifestyle’ changes (e.g. increase in exercise or physical activity, dietary modification, weight loss strategies);
- body mass index (BMI) or body weight;
- need for insulin or other glucose lowering medications after giving birth;
- breastfeeding;
- women’s views of the intervention;
- health professionals’ views of the intervention;
- costs or other measures of resource use.
Timing of outcome measurement
Short-term endpoints will be those measured between six weeks to six months after giving birth; medium-term between six months to 12 months after giving birth; and long-term more than 12 months after giving birth.

Summary of findings table
We will establish a summary of findings table using the following outcomes listed according to priority:
1. Proportion of women having their first OGTT after giving birth;
2. Proportion of women having a blood glucose test other than an OGTT after giving birth;
3. Proportion of women diagnosed with type 2 diabetes or showing impaired glucose tolerance or impaired fasting glucose after giving birth;
4. Health-related quality of life;
5. Diabetes-associated morbidity;
6. Costs or other measures of resource use.

Search methods for identification of studies

Electronic searches
We will use the following sources for the identification of trials:
- The Cochrane Library (last issue);
- MEDLINE (until recent);
- EMBASE (until recent).

We will also search databases of ongoing trials (http://www.controlled-trials.com/ with links to several databases and https://www.clinicaltrialsregister.eu/). We will provide information including trial identifier about recognized studies in the table 'Characteristics of ongoing studies’ and the appendix 'matrix of study endpoints'. For detailed search strategies please see under Appendix 1 (searches will not be older than six months at the moment the final review draft is checked into the Cochrane Information and Management System for editorial approval).

If additional key words of relevance are detected during any of the electronic or other searches we will modify the electronic search strategies to incorporate these terms. We will include studies published in any language.

We will send results of electronic searches to the Editorial Base of the Cochrane Metabolic and Endocrine Disorders Group.

Searching other resources
We will try to identify additional studies by searching the reference lists of included trials and (systematic) reviews, meta-analyses and health technology assessment reports noticed.

Data collection and analysis

Selection of studies
To determine the studies to be assessed further, two authors (PM, CAC) will independently scan the abstract, title or both sections of every record retrieved. All potentially relevant articles will be investigated as full text. Where differences in opinion exist, they will be resolved by a third party. If resolving disagreement is not possible, the article will be added to those ‘awaiting assessment’ and we will contact authors for clarification. A PRISMA (preferred reporting items for systematic reviews and meta-analyses) flow-chart of study selection (Figure 1) will be attached (Liberati 2009).
Figure 1. Study flow diagram.

# records identified through database searching
EMBASE: n =
MEDLINE: n =
The Cochrane Library: n =
Other databases

# additional records identified through other sources

# records after duplicates removed

# records screened

# records excluded

# full-text articles excluded
reasons:
1. (n = ...)
2. (n = ...)
3. (n = ...)
4. (n = ...)
5. (n = ...)
6. (n = ...)

systematic reviews / meta-analyses (n = ...)
HTA-reports (n = ...)

# full-text articles assessed for eligibility

# studies (# publications) included in qualitative synthesis

# studies (# publications) included in quantitative synthesis (meta-analysis)
Data extraction and management
For studies that fulfil inclusion criteria, two authors (PM, CAC) will independently abstract relevant population and intervention characteristics using standard data extraction templates (for details see Table 1, Appendix 2, Appendix 3, Appendix 4, Appendix 5, Appendix 6, Appendix 7) with any disagreements to be resolved by discussion, or if required by a third party. We will send an email request to contact persons of published studies to enquire whether authors are willing to answer questions regarding their trials. The results of this survey will be published in Appendix 8. Thereafter, we will seek relevant missing information on the trial from the original author(s) of the article, if required.

Dealing with duplicate publications
In the case of duplicate publications and companion papers of a primary study, we will try to maximise yield of information by simultaneous evaluation of all available data.

Assessment of risk of bias in included studies
Two authors (PM, CAC) will assess each trial independently. We will resolve possible disagreements by consensus, or in consultation with a third party.
We will assess risk of bias using the Cochrane Collaboration’s tool (Higgins 2011). We will use the following criteria:
- random sequence generation (selection bias);
- allocation concealment (selection bias);
- blinding (performance bias and detection bias), separated for blinding of participants and personnel and blinding of outcome assessment;
- incomplete outcome data (attrition bias);
- selective reporting (reporting bias);
- other bias.
We will judge risk of bias criteria as ‘low risk’, ‘high risk’ or ‘unclear risk’ and use individual bias items as described in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2011). We will attach a ‘risk of bias graph’ figure and ‘risk of bias summary’ figure.
We will assess the impact of individual bias domains on study results at endpoint and study levels.

Measures of treatment effect
Dichotomous data will be expressed as risk ratio (RR) with 95% confidence intervals (CI). Continuous data will be expressed as differences in means (MD) with 95% CI.

Unit of analysis issues
We will take into account the level at which randomisation occurred, such as cross-over trials, cluster-randomised trials and multiple observations for the same outcome.

Dealing with missing data
We will obtain relevant missing data from authors, if feasible and carefully perform evaluation of important numerical data such as screened, randomised patients as well as intention-to-treat (ITT), as-treated and per-protocol (PP) populations. We will investigate attrition rates, for example drop-outs, losses to follow-up and withdrawals and critically appraise issues of missing data and imputation methods (for example last-observation-carried-forward (LOCF)).

Assessment of heterogeneity
In the event of substantial clinical or methodological or statistical heterogeneity we will not report study results as meta-analytically pooled effect estimates.
We will identify heterogeneity by visual inspection of the forest plots and by using a standard Chi² test with a significance level of $\alpha = 0.1$, in view of the low power of this test. We specifically will examine heterogeneity employing the $I^2$ statistic which quantifies inconsistency across studies to assess the impact of heterogeneity on the meta-analysis (Higgins 2002; Higgins 2003), where an $I^2$ statistic of 75% and more indicates a considerable level of inconsistency (Higgins 2011).
When heterogeneity is found, we will attempt to determine potential reasons for it by examining individual study and subgroup characteristics.
We expect the following characteristics to introduce clinical heterogeneity:
- severity of GDM (e.g. required insulin during index pregnancy);
- type of test - OGTT or other glucose test;
- result of glucose test(s) - normal/abnormal; high or low results if abnormal;
- thresholds used in glucose tests for defining normal and abnormal;
- parity;
- maternal age;
- maternal BMI;
- reason for not having a glucose test;
- modality of reminder;
- who was reminded (clinician or woman or both).
Assessment of reporting biases
We will use funnel plots in case we include 10 studies or more for a given outcome to assess small study bias. There are a number of explanations for the asymmetry of a funnel plot (Sterne 2001) and we will carefully interpret results (Lau 2006).

Data synthesis
Data will be summarised statistically if they are available, sufficiently similar and of sufficient quality. We will perform statistical analyses according to the statistical guidelines referenced in the newest version of the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2011).

Subgroup analysis and investigation of heterogeneity
We will mainly carry out subgroup analyses of the primary outcome parameter(s) (see above) and investigate interaction. The following subgroup analyses are planned:
- severity of GDM in index pregnancy (need for insulin or other diabetes medication);
- maternal age (> 35 years versus ≤ 35 years);
- maternal BMI (normal, overweight or obese) - either pre-pregnancy or after giving birth.

Sensitivity analysis
We will perform sensitivity analyses in order to explore the influence of the following factors on effect size:
- restricting the analysis to published studies;
- restricting the analysis taking account risk of bias, as specified above;
- restricting the analysis to very long or large studies to establish how much they dominate the results;
- restricting the analysis to studies using the following filters: diagnostic criteria, language of publication, source of funding (industry versus other), country.

We will also test the robustness of the results by repeating the analysis using different measures of effect size (relative risk, odds ratio etc.) and different statistical models (fixed-effect and random-effects model).

ACKNOWLEDGEMENTS
None.

REFERENCES

Additional references
ACOG 2009

ACOG 2011

ADA 1999

ADA 2008

AIHW 2010

Atherton 2009

Bellamy 2009

Bennett 2011

Berger 2002

Bottalico 2007
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Nield 2008

Norris 2005

Orozco 2008

RANZCOG 2008

Ratner 2007

Ratner 2008

Retnakaran 2008

Retnakaran 2011

Schaefer-Graf 2002

Shah 2008

Simmons 2002

Sterne 2001

Weingarten 2002

Wendland 2011

WHO 1998

* Indicates the major publication for the study

**ADDITIONAL TABLES**

Table 1. Overview of study populations

<table>
<thead>
<tr>
<th>Characteristic - Study ID .</th>
<th>Intervention (s) &amp; control(s)</th>
<th>[n] screened</th>
<th>[n] randomised</th>
<th>[n] safety</th>
<th>[n] ITT</th>
<th>[n] finishing study</th>
<th>[%] of randomised participants finishing study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 1</td>
<td>intervention 1</td>
<td></td>
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Table 1. Overview of study populations (Continued)

<table>
<thead>
<tr>
<th>Study</th>
<th>intervention 1</th>
<th>intervention 2</th>
<th>control 1</th>
<th>control 2</th>
<th>total</th>
</tr>
</thead>
<tbody>
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<td>Study 2</td>
<td>intervention 1</td>
<td>intervention 2</td>
<td>control 1</td>
<td>control 2</td>
<td>total</td>
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<tr>
<td>Study 3</td>
<td>intervention 1</td>
<td>intervention 2</td>
<td>control 1</td>
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<td>total</td>
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<tr>
<td>Study 4</td>
<td>intervention 1</td>
<td>intervention 2</td>
<td>control 1</td>
<td>control 2</td>
<td>total</td>
</tr>
</tbody>
</table>

Total: *all interventions*  
*all controls*

*"-" denotes not reported*

**Abbreviations:** ITT: intention-to-treat
APPENDICES

Appendix 1. Search strategies

### Search terms

Unless otherwise stated, search terms are free text terms; MeSH = Medical subject heading (MEDLINE medical index term); exp = exploded MeSH; the dollar sign ($) stands for any character(s); the question mark (?) substitutes one or no characters; tw = text word; pt = publication type; sh = MeSH; adj = adjacent

#### The Cochrane Library

#1 MeSH descriptor Reminder Systems explode all trees
#2 MeSH descriptor Follow-up studies explode all trees
#3 MeSH descriptor Telephone explode all trees
#4 MeSH descriptor Telemedicine explode all trees
#5 (remind* in All Text or recall* in All Text or letter* in All Text or e-mail in All Text or email in All Text or sms in All Text or telephon in All Text or telefon in All Text or phon in All Text or fone in All Text or follow-up in All Text)
#6 ( (colo?r in All Text and cod* in All Text) or postcard* in All Text or postal in All Text or (mobile in All Text and phon in All Text) or (internet in All Text and based in All Text) )
#7 (telemedicine in All Text or teleconsultation* in All Text or (medical in All Text and record* in All Text) or (flow in All Text and sheet* in All Text) )
#8 (screen* in All Text or test* in All Text)
#9 (#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8)
#10 MeSH descriptor Diabetes mellitus explode all trees
#11 MeSH descriptor Diabetes mellitus explode all trees with qualifiers: PC
#12 MeSH descriptor Glucose intolerance explode all trees
#13 MeSH descriptor Insulin resistance explode all trees
#14 MeSH descriptor Diabetes, gestational explode all trees
#15 ( (diabet* in All Text near/6 diagnos* in All Text) or (diabet* in All Text near/6 prevention* in All Text) or (diabet* in All Text near/6 control* in All Text) )
#16 ( (impaired in All Text near/6 glucos* in All Text) and toleranc* in All Text)
#17 (glucos* in All Text and intoleranc* in All Text)
#18 (insulin in All Text and resistanc* in All Text)
#19 (gestational in All Text near/3 diabet* in All Text)
#20 gdm in All Text
#21 (#10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20)
#22 MeSH descriptor postpartum period explode all trees
#23 MeSH descriptor Postnatal care explode all trees
#24 ( (postpartum in All Text near/6 screen* in All Text) or (postpartum in All Text near/6 management* in All Text) or (postpartum in All Text near/6 care in All Text) )
#25 ( post in All Text and (partum in All Text near/6 screen* in All Text) ) or (post in All Text and (partum in All Text near/6 management* in All Text) ) or (post in All Text and (partum in All Text near/6 period* in All Text) ) or (post in All Text and (partum in All Text near/6 care in All Text) )
#26 ( (postnatal in All Text near/6 care in All Text) or (postnatal in All Text near/6 test* in All Text) )
#27 ( (post in All Text and (natal in All Text near/6 period* in All Text) ) or (post in All Text and (natal in All Text near/6 test* in All Text) )
#28 ( (after in All Text near/3 in All Text) or (after in All Text near/3 deliver* in All Text) )
#29 (#22 or #23 or #24 or #25 or #26 or #27 or #28)
#30 (#9 and #21 and #29)

**MEDLINE**

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(Continued)

1 exp Reminder Systems/
2 exp Follow-up studies/
3 exp Telephone/
4 exp Telemedicine/
5 (remind* or recall* or letter* or e-mail or email or sms or telephon or telefon or follow-up or phon or fon).tw,ot.
6 (colo?r cod* or letter* or postcard* or postal or mobile phon* or internet based).tw,ot.
7 (telemedicine or teleconsultation or medical record or flow sheet).tw,ot.
8 (screen* or test*).tw,ot.
9 or/1-8
10 exp Diabetes Mellitus/di [Diagnosis]
11 exp Diabetes Mellitus/pc [Prevention & Control]
12 exp Glucose Intolerance/
13 exp Insulin Resistance/
14 (diabet* adj6 (diagnos* or prevention* or control*)).tw,ot.
15 (impaired adj6 glucose toleranc*).tw,ot.
16 insulin resistanc*.tw,ot.
17 glucose intoleranc*.tw,ot.
18 exp Diabetes, Gestational/
19 (gestational adj diabet*).tw,ot.
20 gdm.tw,ot.
21 or/10-20
22 exp Postnatal Care/
23 exp Postpartum Period/
24 ((postpartum or post partum) adj6 (screen* or management* or period* or care)).tw,ot.
25 ((postnatal or post natal) adj6 (period* or care or test*)).tw,ot.
26 (after adj (birth* or deliver*)).tw,ot.
27 or/22-26
28 randomized controlled trial.pt.
29 controlled clinical trial.pt.
30 randomi?ed.ab.
31 placebo.ab.
32 drug therapy.fs.
33 randomly.ab.
34 trial.ab.
35 groups.ab.
36 or/28-35
37 Meta-analysis.pt.
38 exp Technology Assessment, Biomedical/
39 exp Meta-analysis/
40 exp Meta-analysis as topic/
41 hta.tw,ot.
42 (health technology adj6 assessment$).tw,ot.
43 (meta analy$ or metaanaly$ or meta?analy$).tw,ot.
44 ((review$ or search$) adj10 (literature$ or medical database$ or medline or pubmed or embase or cochrane or cinahl or psycinfo or psyclit or healthstar or biosis or current content$ or systematic$)).tw,ot.
45 or/37-44
46 36 or 45
47 (comment or editorial or historical-article).pt.
48 46 not 47

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Appendix 2. Characteristics of included studies table: template

<table>
<thead>
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<td>RANDOMISATION RATIO:</td>
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<tr>
<td></td>
<td>SUPERIORITY DESIGN</td>
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<td>NON-INFRINGEMENT DESIGN (specify 1- or 2-sided confidence interval)</td>
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<td></td>
<td>EQUIVALENCE DESIGN (specify 1- or 2-sided confidence interval)</td>
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<td>CONTROLLED CLINICAL TRIAL (CCT)</td>
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<td>DIAGNOSTIC CRITERIA:</td>
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<td>TREATMENT BEFORE STUDY:</td>
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<td></td>
<td>(FOR COMPLEX INTERVENTIONS: DETAILED DESCRIPTION OF ALL INTERVENTIONS)</td>
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<td>Outcomes</td>
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<td>Study details</td>
<td>RUN-IN PERIOD:</td>
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<td>STUDY TERMINATED BEFORE REGULAR END: yes/no</td>
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<td>Publication details</td>
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<td>Quote: &quot;...&quot;.</td>
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<td>Abbreviations:</td>
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### Appendix 3. Description of interventions

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**Footnotes**

“-” denotes not reported

**Abbreviations:** SMS: short message service

### Appendix 4. Baseline characteristics

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<th>Country</th>
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<th>All groups [total]</th>
<th>Sex [female%]</th>
<th>Age [mean years (SD) / range]</th>
<th>Ethnic groups [%]</th>
<th>HbA1c [mean % (SD)]</th>
<th>BMI [mean kg/m² (SD)]</th>
<th>Duration of disease [mean years (SD) / range]</th>
<th>Duration of follow-up [mean years (SD) / range]</th>
<th>Co-interventions</th>
<th>Co-morbidities</th>
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Reminder systems for women with previous gestational diabetes mellitus to increase uptake of testing for type 2 diabetes or impaired glucose tolerance (Protocol)

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### Appendix 5. Matrix of study endpoints

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<thead>
<tr>
<th>Characteristic - Study ID</th>
<th>Intervention(s) &amp; control(s)</th>
<th>Primary(^1) endpoint(s)</th>
<th>Secondary(^2) endpoint(s)</th>
<th>Other(^3) endpoint(s)</th>
<th>Time points for outcome measurement</th>
<th>Trial document(s); Trial identifier</th>
<th>Trial document(s); Primary(^1) endpoint(s)</th>
<th>Trial document(s); Secondary(^2) endpoint(s)</th>
<th>Trial document(s); Other(^3) endpoint(s)</th>
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Footnotes

1,2 verbatim statement in the publication or (registered) trial document; 3 not explicitly stated as primary or secondary endpoint(s) in the publication or (registered) trial document

“-” denotes not reported

Abbreviations: SMS: short message service
## Appendix 6. Definition of endpoint measurement

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<th>Characteristic(s) &amp; control(s)</th>
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<th>Cardiovascular mortality</th>
<th>Compositional macrovascular complications</th>
<th>Non-fatal myocardial infarction</th>
<th>Non-fatal stroke</th>
<th>Pernicious revascularization</th>
<th>Coronary revascularization complications</th>
<th>End-stage renal disease complications</th>
<th>Neplthy</th>
<th>Retinopathy</th>
<th>Retinal photocoagulation</th>
<th>Blindness</th>
<th>Cancer</th>
<th>Severe hyperglycaemia</th>
<th>Severe nocturnal hypoglycaemia</th>
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Reminder systems for women with previous gestational diabetes mellitus to increase uptake of testing for type 2 diabetes or impaired glucose tolerance (Protocol)

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**Footnotes**

“-” denotes not reported

**Abbreviations:** SMS: short message service
## Appendix 7. Adverse events

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<th>Severe/serious adverse events [n/N (%)]</th>
<th>Dropouts due to adverse events [n/N (%)]</th>
<th>Hospitalisation [n/N (%)]</th>
<th>Outpatient treatment [n/N (%)]</th>
<th>All hypoglycaemic episodes [n/N (%)]</th>
<th>Severe / serious hypoglycaemic episodes [n/N (%)]</th>
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Reminder systems for women with previous gestational diabetes mellitus to increase uptake of testing for type 2 diabetes or impaired glucose tolerance (Protocol)

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## Appendix 8. Survey of authors’ providing information on trials

<table>
<thead>
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<th>Characteristic - Study ID</th>
<th>Study author contacted [yes / no]</th>
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**Footnotes**

“-" denotes not reported

**Abbreviations:** SMS: short message service
HISTORY
Protocol first published: Issue 1, 2012

CONTRIBUTIONS OF AUTHORS
PHILIPPA MIDDLETON: drafted the protocol and developed the search strategy. She will acquire copies of potentially eligible papers, select trials, extract data, analyse and interpret data, draft and update review.

CAROLINE A CROWTHER: commented on the protocol draft, and will analyse and interpret data, and comment on drafts of reviews and updates.

DECLARATIONS OF INTEREST
Philippa Middleton and Caroline Crowther are planning a randomised trial of the effect of mobile phone messaging on uptake of postpartum glucose screening tests for women with previous gestational diabetes mellitus (GDM).

SOURCES OF SUPPORT

Internal sources
• ARCH, Robinson Institute, School of Paediatrics and Reproductive Health, The University of Adelaide, Australia.

External sources
• No sources of support supplied