

# Screening for Gestational Diabetes Mellitus (GDM)

Guidelines	Level of Evidence	References
<p>Early in pregnancy all women should receive appropriate written information concerning GDM and be given an opportunity to discuss tests with their midwife or doctor.</p> <p>In the absence of high level evidence to either support or abandon the practice of screening for gestational diabetes mellitus (GDM), midwives and doctors may reasonably a) not offer screening b) selectively offer screening to all women with risk factors or c) offer screening to all pregnant women.</p> <p>If women agree to screening it should be carried out between 24 and 28 weeks' gestation.</p>	<p>IV</p> <p>Consensus opinion</p> <p>Consensus opinion</p>	<p>21</p>
Good Practice Notes		
<p>While it is not possible to issue a guideline for the best method of screening, the use of a 75 g OGTT instead of an OGCT as first line of testing for women from high risk populations will avoid the inconvenience of further testing for both women and staff. Afternoon or evening clinics may be better advised to screen women using an OGCT (rather than an OGTT) because women are not required to fast for the OGCT.</p> <p>It is important to inform women of controversies surround screening and diagnostic tests for GDM.</p>		

## Aim

The aim of these guidelines is to provide information to midwives and doctors regarding screening pregnant women for gestational diabetes mellitus (GDM).

## Evidence

Gestational Diabetes Mellitus (GDM) is defined as carbohydrate intolerance with onset or first recognition in pregnancy. It has been associated with adverse pregnancy outcomes such as increased incidence of maternal hypertension, pre-eclampsia and obstetric intervention. Babies of mothers with GDM may be macrosomic and suffer birth trauma, hypoglycaemia and other metabolic disturbances. Long term effects of GDM on children of affected pregnancies are still under debate<sup>1</sup>. Studies show women who exhibit glucose intolerance during pregnancy have an increased risk of developing type 2 diabetes within 15 years<sup>2,3</sup>. Women diagnosed with gestational diabetes are considered at medium to high risk of pregnancy complications. They generally face more frequent antenatal visits, dietary restrictions, regular capillary glucose testing, early delivery and an increased possibility of caesarean section<sup>4</sup>.

In Australia GDM is variously estimated to affect between 5.5 and 8.8 per cent of pregnant women<sup>5</sup>. Most Australian hospitals screen all women between 24 and 31 weeks gestation in the belief that specialised management of gestational diabetes improves perinatal and long-term outcomes<sup>1,6</sup>. However, the potential benefits of screening programs have not yet been fully weighed against potential harm, inconvenience, emotional effects and expense in well-designed trials<sup>7-12</sup>. A recently published randomised controlled pilot study failed to demonstrate any benefit from intensive management of impaired glucose tolerance in pregnancy with additional maternal inconvenience<sup>4</sup>.

Both the Australasian Diabetes in Pregnancy Society (ADIPS) and Victorian Diabetes Taskforce recommend either universal screening of pregnant women at 26-28 weeks' gestation, using either a 50 or 75 gm oral glucose challenge test (OGCT) as the initial screening test, or going straight to an oral glucose tolerance test (OGTT)<sup>5</sup>. RANZCOG takes no position on the merits of routine screening. Worldwide, however, controversy exists about almost every facet of screening - the merits of screening versus no screening and universal versus selective screening, as well as timing, methods used, diagnostic parameters and the long-term

management of women once the diagnosis is made.<sup>+</sup> The evidence retrieved to support screening is mostly Level III and IV with the exception of Griffin et al (Level II)<sup>13</sup>.

Some findings appear contradictory. A Melbourne study showed that identifying and treating women with hyperglycaemia can significantly reduce perinatal mortality rates<sup>6</sup>, whereas a Canadian study showed that discontinuation of universal screening in a region suggested that screening has little or no impact on perinatal outcomes. Increased screening for GDM identified cases of decreased severity and additional cases identified by universal screening were 'mild'<sup>14</sup>. Some reviewers conclude that until the risk of minor elevations of glucose during pregnancy have been established in appropriately conducted trials, therapy based on this diagnosis must be critically reviewed and debate over screening methods is irrelevant<sup>4,8</sup>. One of the most repeated themes in the GDM literature is a call for a universally accepted and reproducible screening test (as the glucose challenge test is reproducible only 50-70 per cent of the time) and precise diagnostic criteria<sup>9,11,15-17</sup>.

Despite the lack of evidence for current practice most midwives and doctors are cautious about abandoning universal screening in favour of selective screening or no screening at all, and await the outcome of current research. Two trials are underway that seek to provide better evidence regarding GDM screening. The Australasian Carbohydrate Intolerance Study in Pregnancy (ACHOIS) aims to clarify the degree of maternal hyperglycaemia that results in specific adverse outcomes. Results are expected in 2003. The Hyperglycaemia and Adverse Pregnancy Outcome (HAPO) study is expected to answer questions about the association between various levels of glucose intolerance during pregnancy and adverse outcomes. The study will test 25,000 women from 16 centres around the world, including Australia. Results are expected in June 2004.

Selective screening for GDM is generally based on the following risk factors:

- Glycosuria
- Age > 30 years
- Obesity (usually a pre-pregnancy BMI of >27 kg/m<sup>2</sup>)
- A family history of diabetes (among first-degree relatives)

<sup>+</sup> The Fourth International Workshop Conference on GDM recommends universal screening but recognises a place for selective screening. The US Preventive Services Task Force and Canadian Taskforce of the Periodic Health Examination cite insufficient evidence for or against screening for GDM. The American College of Obstetricians and Gynaecologists recommended selective screening in 1986, but made no definite recommendation in 1994 because of the absence of data supporting screening. In 1997 the American Diabetes Association reversed its former call for universal screening in favour of looking at risk factors<sup>11</sup>.

- Previous adverse pregnancy outcome
- Past history of GDM or glucose intolerance
- Belonging to a high-risk ethnic group: Aboriginal or Torres Straits Islander, Polynesian, Middle Eastern, Indian and Asian.

Conversely, a low prevalence of diabetes exists in women who are aged less than 30 years who have a pre-pregnancy weight of  $<25 \text{ kg/m}^2$ , have no family history of diabetes and who do not belong to one of the above ethnic groups<sup>16</sup>.

Advocates of universal screening argue that selective strategies miss a significant percentage of cases and result in minimal cost savings. In an Australian study, Moses et al (1998) conclude that selective screening would potentially miss 10 per cent of all cases of GDM and still require 80 per cent of women to be tested after finding the prevalence of GDM to be 2.8 per cent among 'low risk' women. Insulin use, emergency caesarean section and macrosomic infants of these low risk women with GDM were the same as others with GDM<sup>18</sup>. However, the estimate (of women with GDM missed by selective screening) is based on current diagnostic criteria for GDM - and current diagnostic criteria are not based on studies of pregnancy outcome. Griffin et al conducted a trial that considered the value of universal screening (using the glucose challenge test) in comparison to risk based screening. Universal screening detected more cases, facilitated earlier diagnosis and was associated with improved pregnancy outcomes<sup>13</sup>. However, trial methods were criticised for the randomisation techniques used and that analysis was not conducted on the basis of intention to treat<sup>9</sup>.

A case control study based on 6,032 Melbourne women concluded that selective screening for GDM based on prior risk assessment reduces the need for testing with negligible loss of diagnostic efficiency. The study resulted in a simple algorithm for selective screening for GDM estimated to exclude 17 per cent of women from screening tests. The authors suggested that this method would miss only 0.6 per cent of potential cases<sup>16</sup>. Commentators pointed out that selective screening requires rigorous questioning about ethnic background and family history, as well as accurate weight and height measurement, and this may not be practical in a clinical setting<sup>10</sup>. It has also been suggested that selective screening will reduce costs and may spare some women the anxiety associated with a possible diagnosis and the discomfort or inconvenience associated with the test<sup>16</sup>. As yet there is no published literature that examines women's perspectives of screening or the cost effectiveness of screening in Australia.

Proponents of universal screening claim that the future health of women and children is an important

consideration in the screening debate that treatment of GDM with diet, exercise and weight control may delay the onset of diabetes for many years<sup>12</sup>.

In the context of these debates it is not possible to make a recommendation based on high level evidence concerning the best screening test for GDM. Griffin et al report from the results of their RCT that the sensitivities and specificities of the OGCT vary according to the cut-off level chosen, whether subjects are required to fast before the diagnostic OGTT and which criteria the screening is based on<sup>13</sup>. Four cross-sectional studies reviewed for this set of guidelines suggest the likelihood ratio of the OGCT varied from just above neutral to moderately positive<sup>15, 17, 19, 20</sup>.

## Methods of Search and Appraisal

These strategies were used to search and appraise evidence on screening for GDM during pregnancy:

### I. Search on Defined Questions (August 2000)

The Centre for Clinical Effectiveness (Monash University) searched The Cochrane Library, National Guideline Clearinghouse, Medline, Best Evidence, CINAHL, PsycINFO, Health Star and Sociofile to answer:

1. In pregnant women, does screening for GDM result in better maternal and perinatal outcomes than no screening?
2. In pregnant women, are the glucose challenge test and the glucose tolerance test as effective as the glucose tolerance test alone in detecting GDM?

They identified one cohort study directly addressing the first question and one randomised controlled trial and four cross-sectional studies addressing the second question.

The following outcome measures were considered: detection of GDM, macrosomia, neonatal hyperglycaemia, stillbirth, neonatal morbidity, pre-eclampsia, pre-term birth, caesarean section, fetal abnormality, shoulder dystocia and patient satisfaction. The coordinator searched grey literature and journals for additional evidence published between September 2000 and August 2001.

### II. Consultation with Experts to Identify Evidence and Practice Wisdom.

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