Implementation of HbA1c as a Diagnostic Test in New Zealand

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Diabetes Physician, Christchurch Diabetes Centre, New Zealand
What happened with HbA1c in NZ:

IFCC, IDF, ADA, EASD consensus statements - 2007

3rd August 2009 - dual reporting of IFCC molar and % units

3rd Oct 2011 – molar units only and endorsed for diagnosis
HbA1c to be reported world-wide in IFCC units (mmol/mol) AND:

Derived NGSP units (%) using master equation
- *ie DCCT aligned results*

If the ongoing “average plasma glucose study” fulfils it’s *a priori* specified criteria, A1c derived average glucose value (ADAG) will also be reported

*Diabetes Care* 2007; 30(9): 2399-400
The process of change in NZ

How did we arrive at that point?

What did we do from there?
How did we arrive at that point?

HbA1c came to fore with DCCT (Biorex 70)
Progression of retinopathy vs HbA1c in the DCCT study

Diabetes, 44: 968-983, 1995
How did we arrive at that point?

HbA1c came to fore with DCCT (Biorex 70)
Wide inter-laboratory variation in results led to establishment of National Glycohemoglobin Standardisation Program (NGSP)
NGSP update 2006

http://www.ngsp.org/
How did we arrive at that point?

HbA1c came to fore with DCCT (Biorex 70)
Wide inter-laboratory variation in results led to establishment of NGSP
BUT, peaks on chromatogram don’t correspond to true HbA1c
Typical trace for $\text{HbA}_0/\text{HbA}_{1c}$ separation

$\text{HbA}_{1c}$ refers strictly to glucose attached to N-terminal valine of the beta chains.
How did we arrive at that point?

HbA1c came to fore with DCCT (Biorex 70)

Wide inter-laboratory variation in results led to establishment of NGSP

**BUT**, peaks on chromatogram don’t correspond to true HbA1c

IFCC reference methods developed (HPLC-MS; HPLC-CE) that measure true HbA1c
Flow Chart for Reference Methods

Haemolysate

Enzymatic Cleavage

HPLC-Capillary Electrophoresis

HPLC-Mass Spectrometry

\[ y = 0.926x + 2.05 \]
\[ R^2 = 0.99 \]

Units can be inter-converted by “master equation”
How did we arrive at that point?

HbA1c came to fore with DCCT (Biorex 70)
Wide inter-laboratory variation in results led to establishment of NGSP

**BUT**, peaks on chromatogram don’t correspond to true HbA1c

IFCC reference methods developed (HPLC-MS; HPLC-CE) that measure true HbA1c

Advocacy for molar units
HbA1c to be reported world-wide in IFCC units (mmol/mol) **AND**:

Derived NGSP units (%) using master equation
- *ie DCCT aligned results*

If the ongoing “average plasma glucose study” fulfils it’s *a priori* specified criteria, A1c derived average glucose value (ADAG) will also be reported

*Diabetes Care* 2007; 30(9): 2399-400
So, where did we go from there?
Welcome to the NZSSD website

NZSSD is an incorporated society that is open to those involved in the care of people with diabetes. It has over 250 members including diabetes specialist physicians, diabetes specialist nurses, podiatrists, dietitians, ophthalmologists, general physicians, family doctors, community health workers and allied industries.

NZSSD is the national advisory body on scientific and clinical diabetes care and standards. NZSSD's objectives are to promote the study of diabetes and the best standards of care of diabetes in New Zealand. It also

LATEST NEWS
Nurse prescribing discussion document here as per e-mail 3/8/10

1st Asia Pacific Congress on Controversies to Consensus in Diabetes, Obesity and Hypertension (GODHy)
Shanghai, China, June 2-5, 2011

http://www.comtecmed.com/codhy/china/

ASIA PACIFIC CONFERENCE ON METABOLIC SYNDROME (APCMS 2010) November 5-7, 2010 at the Grand Copthorne Waterfront
The consultation process in NZ:

NZSSD Physicians consulted – 2003 (Michael Crooke)

IFCC, IDF, ADA, EASD consensus statements - 2007

NZSSD Physicians consulted – 2008 (Chris Florkowski)
NZSSD membership canvassed
Position Statement

Laboratories consulted re preparedness
3\textsuperscript{rd} August 2009 for dual reporting
3\textsuperscript{rd} Oct 2011 – molar units only and endorsed for diagnosis
NZSSD Position Statement on standardisation of reporting units for HbA1c and application of estimated average glucose (eAG)

New Zealand NZS clinical laboratories should implement dual reporting of HbA1c in both molar units (transfers) and currently reported DCCT-aligned units (%), as recommended in a consensus statement from ADA, EASD, IFCC and IDF, published in 2007. After a period of two years from the time of implementation it is envisaged that only molar units will be reported.

Although explicit times have been set in the United Kingdom (1 June 2009 for initiation of dual reporting and 1 June 2011 for reporting only molar units), it is most important that implementation is coordinated across NZ laboratories, ideally in synchrony with Australia. The NZ clinical laboratory community should cooperate to achieve dual reporting in a standardised format.

There is some evidence in support of also reporting estimated average glucose (eAG), although this has not received universal endorsement. It is recommended that eAG may be used at the discretion of individual practitioners as an educational tool at the point of delivery of care to patients with diabetes. It is not recommended that eAG should appear on laboratory reports at the present time, although there should be flexibility to adopt this if a strong Australian commitment emerges.

The above recommendations should be supported by educational tools and resources, which should be adapted to meet local requirements.

This position statement was written by Dr Chris Florakowsi and Dr Michael Crooke and was endorsed by the NZSSD Executive on 20 February 2009.

• Dual reporting
• From 03 August 2009
• View to dropping % and reporting only molar units after 2y
NZ clinical laboratories should implement dual reporting of HbA1c in both molar units (mmol/mol) and DCCT-aligned units (%), as recommended in a consensus statement from ADA, EASD, IFCC and IDF, published in 2007.

After a period of two years from the time of implementation it is envisaged that only molar units will be reported.
Although explicit times have been set in the UK, it is most important that implementation is coordinated across NZ laboratories, *ideally in synchrony with Australasia*. The NZ clinical laboratory community should cooperate to achieve dual reporting in a standardised format.
HbA1c (IFCC) | 66 | mmol/mol | H 20-42
HbA1c | 8.2 | % | H 4.0-6.0

HbA1c Comment:

HbA1c interpretation:
Non-Diabetic reference interval 20 - 42 mmol/mol (4 - 6%)
Target value for patients with diabetes <= 53 mmol/mol (<= 7%)
If result is greater than 64 mmol/mol (8%) consider additional action
HbA1c: molar units – preparing the way

Information sent from NZSSD to PHOs

Clinical laboratories inform their referring doctors

Patient groups informed – Diabetes New Zealand

Information through publications
  NZ Doctor
  NZMJ
IMPORTANT: Imminent change in reporting of HbA1c from all NZ laboratories

Acknowledgement: Based on Information by Diabetes UK and adapted for New Zealand purposes by Dr Chris Flockowski and Dr Michael Crooke

Change to reporting of HbA1c – what is happening and why

From Monday 03 August, the way in which HbA1c results are reported in New Zealand is changing. The following explains why and how this will happen.

What is HbA1c?

Glucose in the blood sticks to haemoglobin in red blood cells, making glycated haemoglobin, called haemoglobin A1c or HbA1c. The more glucose in your blood, the more HbA1c will be present, so the level reported will be higher. The HbA1c gives a measure of what your average blood glucose level has been in the previous 2-3 months.

What does it tell us?

The better your blood glucose control the less chance there is of you developing diabetes complications such as eye, kidney or nerve damage, heart disease or stroke. Red blood cells live for about 8 – 12 weeks before being replaced so the HbA1c test tells you what your blood glucose has been over the past few months and whether you are on target to keep your risk of complications as low as possible.

Change to reporting of results for Hemoglobin A1c (HbA1c)

Dr Michael Crooke
Chemical Pathologist

From August 3rd 2009, the units reported for HbA1c by laboratories in the Wellington region will change. Other laboratories in New Zealand will make the same change on this date. The new mode of reporting has already been implemented in the UK and information is available at http://www.diabetes.org.uk/Professionals/Information_resources/Changes-to-HbA1cvalues/

The change is being made in response to an international consensus statement, published in 2007, which has been endorsed in a position statement from the New Zealand Society for the Study of Diabetes, dated March 2009 http://www.nzsssd.org.nz/position_statements/standardisation.html

<table>
<thead>
<tr>
<th>Current DCCT aligned units [ %]</th>
<th>New IFCC units [mmol/mol]</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td>42</td>
</tr>
<tr>
<td>6.5</td>
<td>48</td>
</tr>
<tr>
<td>7.0</td>
<td>53</td>
</tr>
<tr>
<td>7.5</td>
<td>59</td>
</tr>
<tr>
<td>8.0</td>
<td>64</td>
</tr>
<tr>
<td>9.0</td>
<td>75</td>
</tr>
</tbody>
</table>
Change to reporting of results for Hemoglobin A1c

From August 3rd 2009, the units reported for HbA1c by laboratories in New Zealand. The new mode of reporting has already been implemented in the UK and information is available here.

The change is being made in response to an international consensus statement, published in 2007, which has been endorsed in a position statement from the New Zealand Society for the Study of Diabetes, dated March 2009 click here.

Currently, HbA1c is reported in % and the assays are standardised against the methods used in major clinical trials, especially the Diabetes Control and Complications Trial [DCCT].
Standardisation of reporting haemoglobin A₁c: adoption of the New Zealand Society for the Study of Diabetes (NZSSD) position statement

Chris Florkowski, Michael Crooke

The haemoglobin A₁c (HbA₁c) assay has become the gold-standard measurement of chronic glycaemia, providing an integrated index of glycaemic control over the preceding 2–3 months and with elevated values related to increased risk of microvascular and probably macrovascular complications of diabetes mellitus. The present article describes some of the issues related to HbA₁c and how global initiatives have addressed the non-standardisation of this assay, culminating in a major international consensus statement, with implications for the way HbA₁c is reported world-wide from clinical laboratories.
Consensus meeting on reporting glycated haemoglobin (HbA\textsubscript{1c}) and estimated average glucose (eAG) in the UK: report to the National Director for Diabetes, Department of Health

J. H. Barth*, S. M. Marshall† and I. D. Watson*†

*Association for Clinical Biochemistry, †School of Clinical Medical Sciences, University of Newcastle upon Tyne Medical School, Newcastle upon Tyne, UK

Summary recommendations for the UK

- HbA\textsubscript{1c} results should be reported in both IFCC units (mmol/mol) and derived NGSP units (%) (synonymous with the Diabetes Control and Complications Trial), using the IFCC-NGSP master equation for the time being.

- There is currently insufficient experimental evidence to support the introduction of eAG.
- Further research into the individual utility of eAG and of its use in all groups of individuals with diabetes is required in order to determine what role reporting of eAG has in clinical practice.
Consensus meeting on reporting glycated haemoglobin (HbA1c) and estimated average glucose (eAG) in the UK: report to the National Director for Diabetes, Department of Health

J. H. Barth*, S. M. Marshall† and I. D. Watson*†

*Association for Clinical Biochemistry, †School of Clinical Medical Sciences, University of Newcastle upon Tyne Medical School, Newcastle upon Tyne, UK

Table 2  Professional organizations represented at the London meeting

<table>
<thead>
<tr>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Association for Clinical Biochemistry</td>
</tr>
<tr>
<td>Association of Clinical Pathologists</td>
</tr>
<tr>
<td>Association of British Clinical Diabetologists</td>
</tr>
<tr>
<td>Australian Association of Clinical Biochemists</td>
</tr>
<tr>
<td>British In-Vitro Diagnostics Association</td>
</tr>
<tr>
<td>Department of Health of England</td>
</tr>
<tr>
<td>Diabetes UK</td>
</tr>
<tr>
<td>European Federation of Clinical Chemistry</td>
</tr>
<tr>
<td>International Diabetes Foundation</td>
</tr>
<tr>
<td>International Federation of Clinical Chemistry and Laboratory</td>
</tr>
<tr>
<td>Medicine</td>
</tr>
<tr>
<td>Primary Care Diabetes Society</td>
</tr>
<tr>
<td>Royal College of General Practitioners</td>
</tr>
<tr>
<td>Royal College of Nursing</td>
</tr>
<tr>
<td>Royal College of Obstetricians and Gynaecologists</td>
</tr>
<tr>
<td>Royal College of Pathologists</td>
</tr>
<tr>
<td>Royal College of Physicians</td>
</tr>
<tr>
<td>UK National External Quality Assessment Scheme (UK NEQAS)</td>
</tr>
<tr>
<td>Wales External Quality Assessment Scheme (WEQAS)</td>
</tr>
</tbody>
</table>

Diabetic Medicine 2008; 25: 381-2
HbA1c: molar units – the timeline

• Should we have consulted more widely?

• No – NZSSD has strong “currency”
• NZSSD has broad membership
There is some evidence in support of reporting estimated average glucose (eAG), although this has not received universal endorsement. It is recommended that eAG may be used at the discretion of individual practitioners as an educational tool at the point of delivery of care.

.....but not on laboratory reports
Average Glucose
Blood pressure
Cholesterol

I WANT YOU... to help make the “A” understandable!
It is not recommended that eAG should appear on laboratory reports at the present time, although there should be flexibility to adopt this if a strong Australasian commitment emerges.
HbA₁c as indicator of Diabetes Control

HbA₁c

DCCT%
4.9%

IFCC mmol/mol
30

Blood Glucose* (mmol/L)
5.2
6.7
8.1
9.6
11.0
12.5
13.9
15.4

100

11.3%

9.5%

10.4%

8.6%

7.6%

6.7%

5.8%

60

70

80

90


Christchurch Diabetes Centre 2009

*This is an estimated average glucose (eAG)
Feedback after initial adoption of molar units:

Lack of dissention from clinicians
but what will happen when we drop %?

Why not round targets?
(53 and 64 mmol/mol corresponding to 7 and 8%)
eg why not round to 50 and 65?

Electronic storage, databases – MOH, PHOs
Different LOINC codes for different units

Issues for reporting with POCT devices
Diagnosis and classification of diabetes mellitus
ADA position statement 2010; Diabetes Care 33 Supplement 1: 62-69

Table 3—Criteria for the diagnosis of diabetes

1. A1C ≥6.5%. The test should be performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay.*
   OR
2. FPG ≥126 mg/dl (7.0 mmol/l). Fasting is defined as no caloric intake for at least 8 h.*
   OR
3. 2-h plasma glucose ≥200 mg/dl (11.1 mmol/l) during an OGTT. The test should be performed as described by the World Health Organization, using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water.*
   OR
4. In a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose ≥200 mg/dl (11.1 mmol/l).

*In the absence of unequivocal hyperglycemia, criteria 1–3 should be confirmed by repeat testing.
Use of Glycated Haemoglobin (HbA1c) in the Diagnosis of Diabetes Mellitus

Abbreviated Report of a WHO Consultation
The WHO Consultation concluded that HbA1c can be used as a diagnostic test for diabetes, provided that stringent quality assurance tests are in place and assays are standardised to criteria aligned to the international reference values, and there are no conditions present which preclude its accurate measurement.

An HbA1c of 6.5% is recommended as the cut point for diagnosing diabetes. A value less than 6.5% does not exclude diabetes diagnosed using glucose tests. The expert group concluded that there is currently insufficient evidence to make any formal recommendation on the interpretation of HbA1c levels below 6.5%.

GRADE quality of evidence: moderate
GRADE strength of recommendation: conditional
Figure 2. Prevalence of retinopathy by 0.5 mmol/L intervals for FPG and 2-h PG and by 0.5% intervals for HbA1c for any retinopathy and diabetes-specific retinopathy (≥ moderate NPDR) from DETECT-2.

Diabetes Care 2011; 34(1):145-50
HbA1c and diabetes diagnosis in NZ

• Cut-off 50 mmol/mol (=6.7%) is set high
• BUT it’s memorable and helps molar units to “stick”

• Specificity is maximised

• Sensitivity is lower (approx 30% cases may be “missed” relative to glucose based criteria)
• BUT they get rechecked in 6-12/12 and CV risk factors will be addressed through lifestyle
What actually happened in August 2011

- Wide dissemination of reminder material from NZSSD and laboratories from February 2011
- About 6 weeks from implementation it became evident that many primary care software systems could not process the molar units in a form required by the Ministry of health for audit, nor could various third party clinical support programs, eg risk calculators, use them – despite reminders to vendors over the 2 years
- Protracted and acrimonious exchanges
  - MOH undertook mediation, arbitration and coercion
  - Dual units and use in diagnosis achieved 3rd October 2011
<table>
<thead>
<tr>
<th>Result</th>
<th>Action</th>
<th>Why</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptomatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HbA1c ≥ 50 mmol/mol and, if measured,</td>
<td>No further tests required</td>
<td>Diabetes is confirmed</td>
</tr>
<tr>
<td>Fasting glucose ≥7.0 mmol/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Random blood glucose ≥11.1 mmol/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Asymptomatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HbA1c ≥ 50 mmol/mol and, if measured,</td>
<td>Repeat HbA1c or a fasting</td>
<td>Two results above the</td>
</tr>
<tr>
<td>Fasting glucose ≥7.0 mmol/L</td>
<td>plasma glucose</td>
<td>diagnostic cutoffs, on</td>
</tr>
<tr>
<td>Or</td>
<td></td>
<td>separate occasions are required for the diagnosis of diabetes*</td>
</tr>
<tr>
<td>Random glucose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 11.1 mmol/L</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Example of a comment:

Request forms don’t indicate whether for diagnosis or monitoring

Caveats are indicated
<table>
<thead>
<tr>
<th>HbA1c 41-49 mmol/mol and, if measured, Fasting glucose 6.1–6.9 mmol/L</th>
<th>Advise on diet and lifestyle modification. Repeat the test after 6-12 months</th>
<th>Results indicate ‘pre-diabetes’ or impaired fasting glucose*</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c ≤ 40 mmol/mol and, if measured, Fasting glucose ≤6 mmol/L</td>
<td>Retest at intervals as suggested in cardiovascular risk factor guidelines</td>
<td>This result is normal</td>
</tr>
</tbody>
</table>

*When HbA1c and fasting glucose are discordant with regard to diagnosis of diabetes, repeat testing at an interval of 3-6 months is recommended. The test that is above the diagnostic cut point should be repeated – if the second test remains above the diagnostic threshold then diabetes is confirmed. If the second result is discordant with the first then subsequent repeat testing at intervals of 3-6 months is recommended. Patients with discordant results are likely to have test results near the diagnostic threshold.
Diagnosis of diabetes

Any of the following confirms a diagnosis of diabetes:

1. If HbA1c ≥ 50 mmol/mol and (if measured) FBG ≥ 7 mmol/l (or a random blood glucose (RBG) > 11.1 mmol/l) and the patient is:
   - symptomatic, then no further tests are required and diabetes is confirmed.
   - asymptomatic, then a repeated HbA1c (preferred option), or a FBG which is elevated on another occasion, is required to make a diagnosis of diabetes.

2. Two FBG results ≥ 7 mmol/l on two different days. An OGTT is not required.

3. A RBG > 11.1 mmol/l on two different days.

4. A diagnosis of diabetes can be made with one diagnostic value (i.e., FBG or RBG) if it is unequivocally elevated with symptoms of hyperglycaemia.

5. An OGTT with either FBG ≥ 7.0 mmol/l and/or the 2 hour blood glucose at two hours ≥ 11.1 mmol/l.
• New Zealand guidelines recommend that screening for type 2 diabetes be undertaken *in conjunction with cardiovascular risk assessment*
Age at which to start cardiovascular disease risk assessment in adults (NZGG 2009)
Screening intervals are 3-5 yearly depending on risk

1. Asymptomatic people without known risk factors: **Men at age 45; women at age 55**

2. Maori, Pacific and Indo-Asian peoples*: **Men at age 35; women at age 45 years**

3. Screening is recommended 10 years earlier in the presence of other known cardiovascular risk factors or in those at high risk of developing diabetes

   **Family history risk factors**
   - Diabetes in first-degree relative (parent, brother or sister)
   - Premature coronary heart disease or ischaemic stroke in a first-degree relative (father or brother <55 years, mother or sister <65 years)

   **Personal history risk factors**
   - People who smoke (or who have quit only in the last 12 months)
   - Gestational diabetes
   - Polycystic ovary syndrome
   - Prior blood pressure ≥100/95 mm Hg
   - Prior TC:HDL ratio ≥7
   - Known borderline HbA1c (41-49 mmol/mol) or fasting glucose 6.1-6.9 mmol/l
   - BMI ≥30 kg/m² or truncal obesity (waist circumference ≥94 cm in men or ≥80 cm in women)
   - Estimated glomerular filtration rate (eGFR) <60 ml/min/1.73m²

4. People with diabetes (annually from the time of diagnosis)
• New Zealand guidelines recommend that screening for type 2 diabetes be undertaken in conjunction with cardiovascular risk assessment.

• NZSSD supports this approach and recommends additional opportunistic case finding amongst high-risk individuals in general practice and other clinical settings.
In addition, NZSSD recommends undertaking opportunistic screening for type 2 diabetes, in those adults over 25 years of age:

- with ischaemic heart disease (angina or myocardial infarction), cerebrovascular disease or peripheral vascular disease, or
- on long-term steroid or antipsychotic treatment, or
- who are obese (BMI ≥30; or BMI ≥27 kgm⁻² for Indo-Asian peoples), or
- with a family history of early age of onset type 2 diabetes in more than one first degree relative or
- have a past personal history of gestational diabetes mellitus.
Screening tests

A glycated haemoglobin (HbA1c) is the recommended diagnostic screening test. It should be measured by an accredited laboratory. Point-of-care assays are not sufficiently accurate for use in diagnosis nor is there a permanent record of the result. If it is not possible to measure HbA1c, or there are concerns about its validity, then a fasting plasma glucose is recommended [5]. A fasting glucose might also be measured at the time of CVD risk assessment of lipids.

If not possible to measure HbA1c or there are concerns about its validity, then FBG is recommended
Factors that Interfere with HbA1c Test Results

Updated 4/2010

Information for physicians and patients regarding HbS, HbC, HbE and HbD traits

More about hemoglobin variants and HbA1c can also be found at the NIDDK web site:
Sickle Cell Trait and Other Hemoglobinopathies and Diabetes: Important Information for Physicians
For People of African, Mediterranean, or Southeast Asian Heritage: Important Information about Diabetes Blood Tests

http://www.ngsp.org/factors.asp
How are Hb variants picked up?

- May already be known to have variant

- HbA1c results discordant from prevailing blood glucose – noted by clinician

- Abnormal chromatograms – noted by laboratory
  (not all laboratories routinely inspect chromatograms)

...if any haemoglobinopathy suspected, use glucose based criteria
Other confounding factors for HbA1c interpretation

- Haemolysis – abnormal RBC turnover
- Frequency of venesection
  *eg patients with haemochromatosis*
- Iron deficiency can increase HbA1c
- Renal disease; uraemia, RBC turnover
- Any chronic disease

*if present, use glucose based criteria*
Screening tests

A glycated haemoglobin (HbA1c) is the recommended diagnostic screening test. It should be measured by an accredited laboratory. **Point-of-care assays are not sufficiently accurate for use in diagnosis nor is there a permanent record of the result.** If it is not possible to measure HbA1c, or there are concerns about its validity, then a fasting plasma glucose is recommended [5]. A fasting glucose might also be measured at the time of CVD risk assessment of lipids.

...but emerging data to support performance
HbA1c and diabetes diagnosis in NZ

• Expect to see fewer OGTTs

• **BUT**, we would expect more people to be tested with HbA1c, being more convenient and not requiring any preparation
Data from Aotea Pathology, WLG; courtesy of Michael Crooke
Implementation of the HbA1c IFCC unit — from the laboratory to the consumer: The New Zealand experience

Christopher Horkowski a,⁎, Michael Crooke b, c, Maxine Reed c

a Canterbury Health Laboratories, Christchurch, New Zealand
b Chemical Pathology, Wellington Hospital, New Zealand
c Actea Pathology, Wellington, New Zealand
We are fortunate in New Zealand to have close collaboration between the diabetes clinical and laboratory communities. It cannot be understated just how important genuine clinical engagement is in such a process.
But wait, there’s more..
Diabetes in Pregnancy

2014

Quick reference guide for health professionals on the screening, diagnosis and treatment of gestational diabetes in New Zealand

http://www.health.govt.nz/
≥ 50 mmol/mol: Type 2 diabetes
Refer to a diabetes in pregnancy clinic

HbA1c test
All pregnant women prior to 20 weeks gestation

41 – 49 mmol/mol: High risk
Lifestyle intervention*

≤ 40 mmol/mol: Low risk

Prior to 20 weeks gestation

24 – 28 weeks gestation

1 hour 50 g oral glucose tolerance test (OGTT)

2 hour 75 g OGTT

1 hour glucose ≥ 11.1 mmol/L?

1 hour glucose ≥ 7.8 mmol/L?

Yes

Yes

No

No

1 hour glucose ≥ 11.1 mmol/L?

Yes

Refer to a diabetes in pregnancy clinic

Proceed with routine care

Fasting glucose ≥ 5.5 mmol/L? OR 2 hour glucose ≥ 9.0 mmol/L?

* Clinical opinion and DHB policy varies for pregnant women with an HbA1c of 41 – 49 mmol/mol; local treatment guidelines may recommend referral to a diabetes in pregnancy clinic for women in this category depending on other risk factors.

HbA1c in early pregnancy

- Screening for undiagnosed type 2 diabetes
- Supported by the STEP study
  HbA1c 41–46 mmol/mol; poorer pregnancy outcomes cf those with HbA1c <41; RR major congenital anomaly 2.67; perinatal death 3.96
  *Diabetes Care 2014;37:2953–2959*

- Women randomised to PINTO trial
  - According to HbA1c 41-47 mmol/mol
  - Usual cares (later OGTT) vs targeted diet & lifestyle advice
• Laboratories not involved in MOH guideline
• Laboratories not properly informed
• No extra funding provision

Engagement with the laboratory is just as important as engagement with the clinicians