Gestational Diabetes Mellitus

Should GPs keep a register of everyone with GDM?

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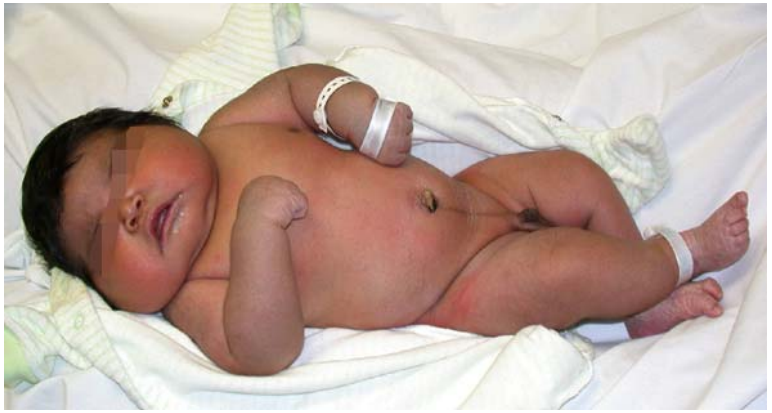
National Screening Advisory Committee *at* The Royal New Zealand College of General Practitioners Conference, Christchurch, 3 September 2010

Definition of GDM

- GDM is defined as carbohydrate intolerance that is first recognised during pregnancy.
- Definition of intolerance varies from frank type 2 diabetes to variable levels of severity depending on local definitions.
- Currently in New Zealand we usually consider the diagnosis as being made if following an OGTT the fasting blood glucose is >= 5.5mmol/L and/or the 2 hour glucose concentration is >= 9 mmol/L.

Why is GDM important?

- Adverse pregnancy outcomes.
  - Maternal include pre-eclampsia, LSCS and perineal trauma.
  - Perinatal include macrosomia, stillbirth, shoulder dystocia, hypoglycaemia, respiratory distress.
- Adverse problems in later life
  - Maternal – development of diabetes
  - Child – increased risk of obesity, IGT and diabetes



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Should we screen?

- Who do we screen?
- What test do we use?
- Do we have an intervention that works?
- Is it cost effective?

Who should we screen?

- Targeted or population based.
- Approx 3% of European, 6% of Māori and more than 10% of Asian women will have GDM diagnosed in pregnancy.
- Targeted screening can miss 10- 60% of cases (no figures from NZ)

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What test do we use?

- Generally in NZ use a glucose challenge test which if positive is followed by an OGTT
- Glucose challenge – non fasting load of 50g glucose at 24-28 weeks. Refer for OGTT if 1 hour glucose is greater than 7.8 mmol/L
- Offer an HbA1c at booking to women with a previous history or thought to have undiagnosed diabetes.
- UK (NICE) recommend OGTT for high risk women only

Do we have an intervention that works?

- Good evidence from RCTs that good glycaemic control in pregnancy can reduce incidence of large for gestational age/macrosomia.

- Also good evidence that lifestyle intervention in women with a history of GDM casn delay the development of Type 2 diabetes

- No evidence of impact of intervention on risks in new borns,

Is there any harm?

- Suggestion that there is an increase risk of intervention.
- Labelling effect.
- HAPO (Hyperglycaemia Adverse Pregnancy Outcome study) showed no clear cut-off points e.g. for caesarean section.

HAPO – *NEJM 2008*

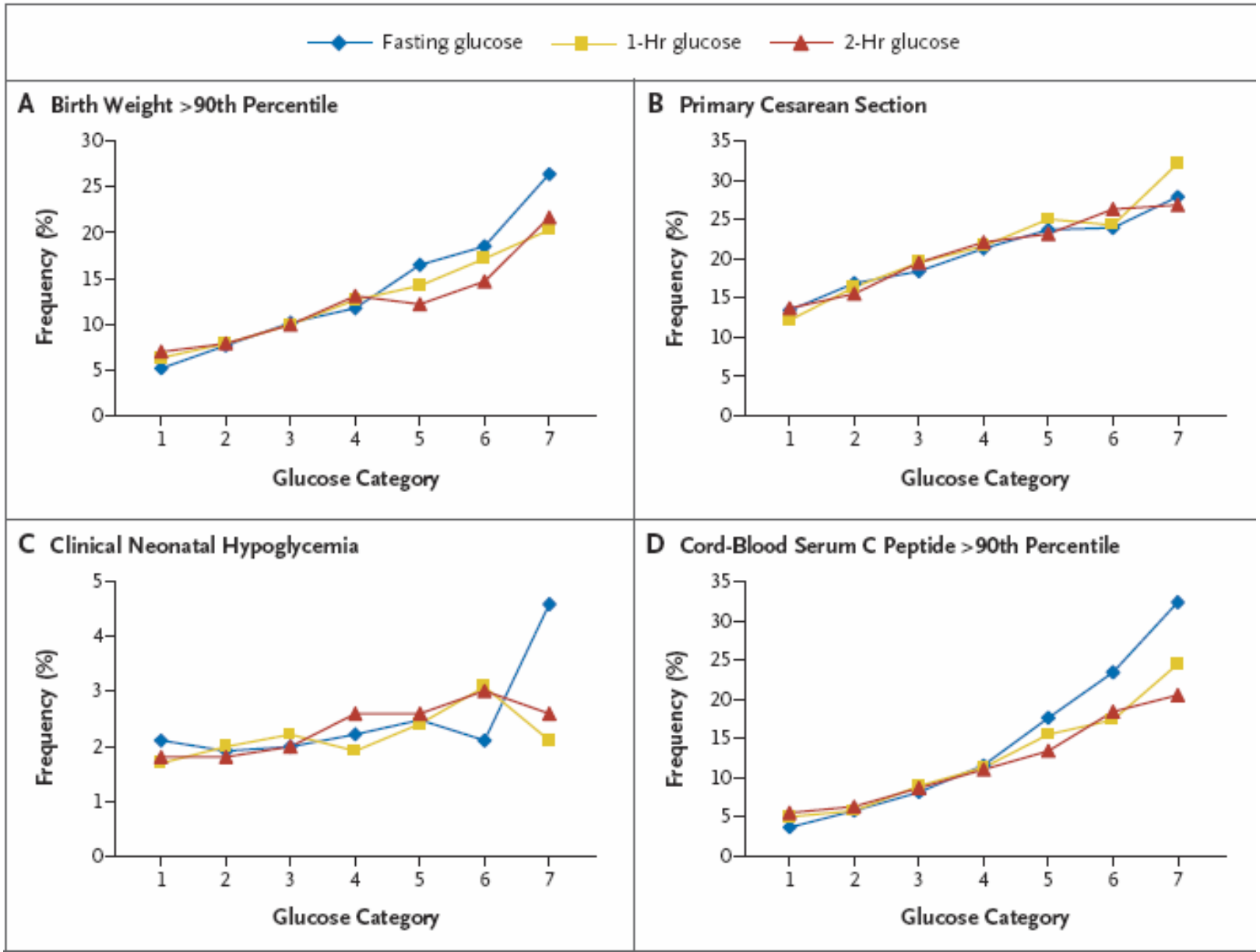

Table 3. Adjusted Odds Ratios for Associations between Maternal Glycemia as a Continuous Variable and Primary and Secondary Perinatal Outcomes.*

Outcome	Plasma Glucose Level		
	Fasting	At 1 Hr	At 2 Hr
	odds ratio (95% CI)		
Primary outcome			
Birth weight >90th percentile	1.38 (1.32–1.44)	1.46 (1.39–1.53)	1.38 (1.32–1.44)
Primary cesarean section†	1.11 (1.06–1.15)	1.10 (1.06–1.15)	1.08 (1.03–1.12)
Clinical neonatal hypoglycemia	1.08 (0.98–1.19)‡	1.13 (1.03–1.26)	1.10 (1.00–1.12)
Cord-blood serum C peptide >90th percentile	1.55 (1.47–1.64)	1.46 (1.38–1.54)	1.37 (1.30–1.44)
Secondary outcome			
Premature delivery (before 37 wk)	1.05 (0.99–1.11)	1.18 (1.12–1.25)	1.16 (1.10–1.23)
Shoulder dystocia or birth injury	1.18 (1.04–1.33)	1.23 (1.09–1.38)	1.22 (1.09–1.37)
Intensive neonatal care	0.99 (0.94–1.05)	1.07 (1.02–1.13)	1.09 (1.03–1.14)
Hyperbilirubinemia	1.00 (0.95–1.05)	1.11 (1.05–1.17)	1.08 (1.02–1.13)
Preeclampsia	1.21 (1.13–1.29)	1.28 (1.20–1.37)	1.28 (1.20–1.37)

* Odds ratios were for an increase in the glucose level of 1 SD (6.9 mg per deciliter [0.4 mmol per liter] for the fasting plasma glucose level, 30.9 mg per deciliter [1.7 mmol per liter] for the 1-hr plasma glucose level, and 23.5 mg per deciliter [1.3 mmol per liter] for the 2-hr plasma glucose level). The model for preeclampsia did not include adjustment for hospitalization or mean arterial pressure, and presence or absence of family history of hypertension or prenatal urinary tract infection was included in the model for preeclampsia only. See Table 2 for other details about adjustments in each model.
† Data for women who had had a previous cesarean section were excluded.
‡ The P value for the quadratic (nonlinear) association was 0.013.

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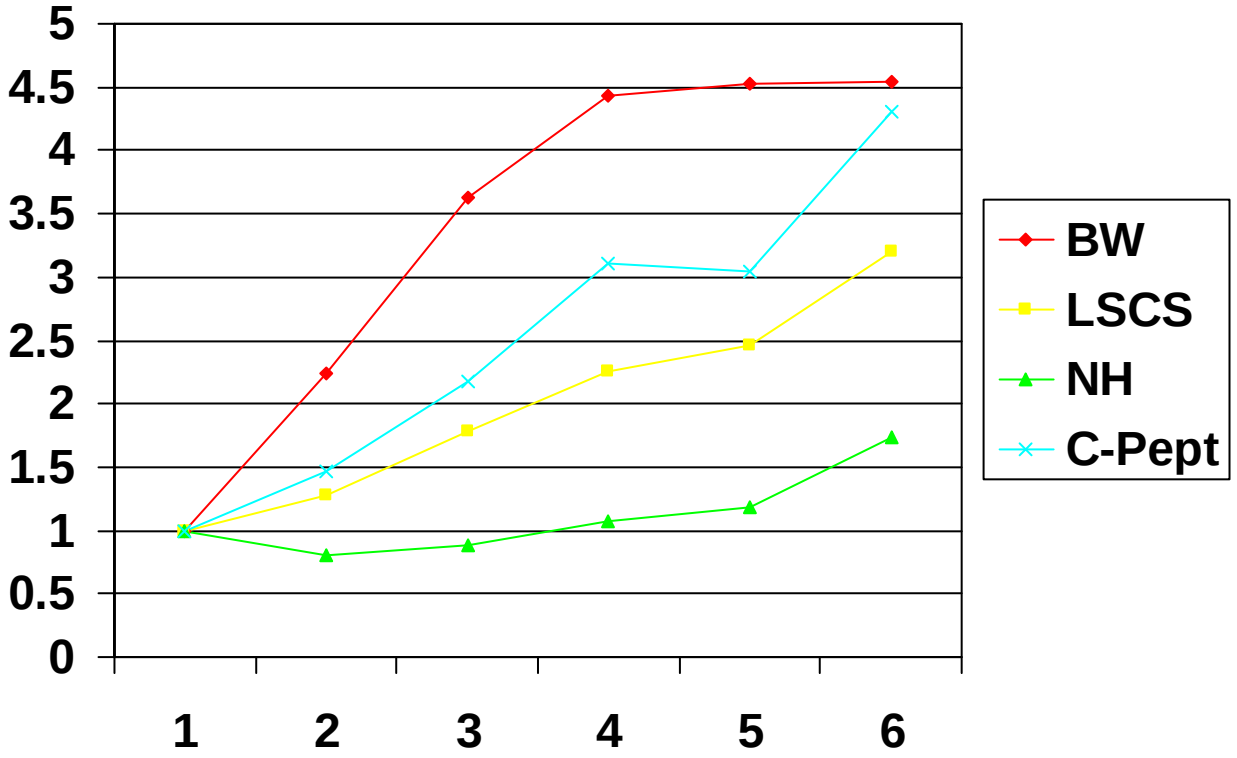
HAPO and increasing weight 1 (< 22.6), 6 (> 42)



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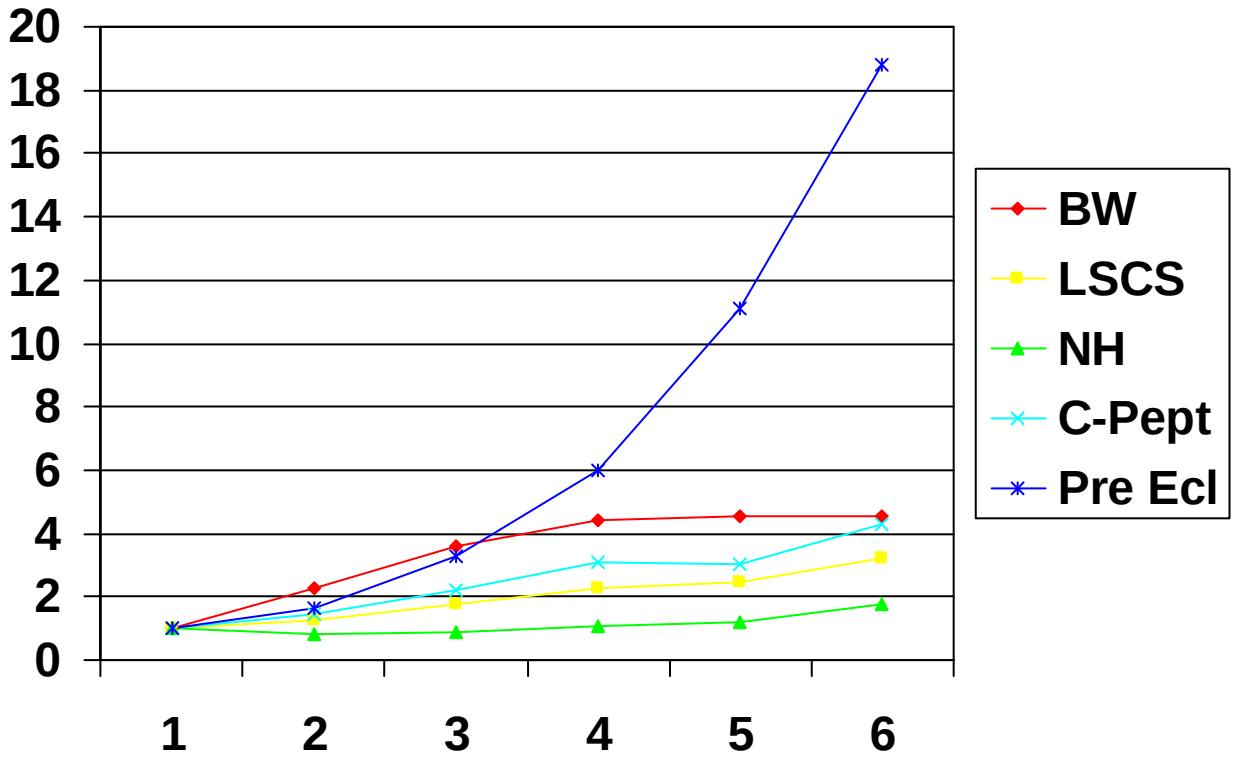
HAPO and increasing weight



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Is it cost effective?

- For every 100 women, singleton pregnancy and positive OGTT offered treatment for mild gestational diabetes mellitus in addition to routine obstetric care.
- $53,985 additional direct costs were incurred at the obstetric hospital
- $6,521 additional charges were incurred by women and their families
- 9.7 additional women experienced induction of labour
- 8.6 more babies were admitted to a neonatal nursery.

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Is it cost effective?

- 2.2 fewer babies experienced serious perinatal complication
- 1.0 fewer babies experienced perinatal death
- The incremental cost per additional serious perinatal complication prevented was $27,503
- Per perinatal death prevented was $60,506
- Per discounted life-year gained was $2,988.

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So what is the role for general practice?

- Post natal OGTT – only 50-60% of women with GDM get a post-natal OGTT.
- Of those that do approx 15-20% are diagnosed with Type 2 diabetes at postnatal check.
- Of those who have a normal OGTT postnatally approx 3% per annum will develop Type 2 diabetes – or 30% in 10 years

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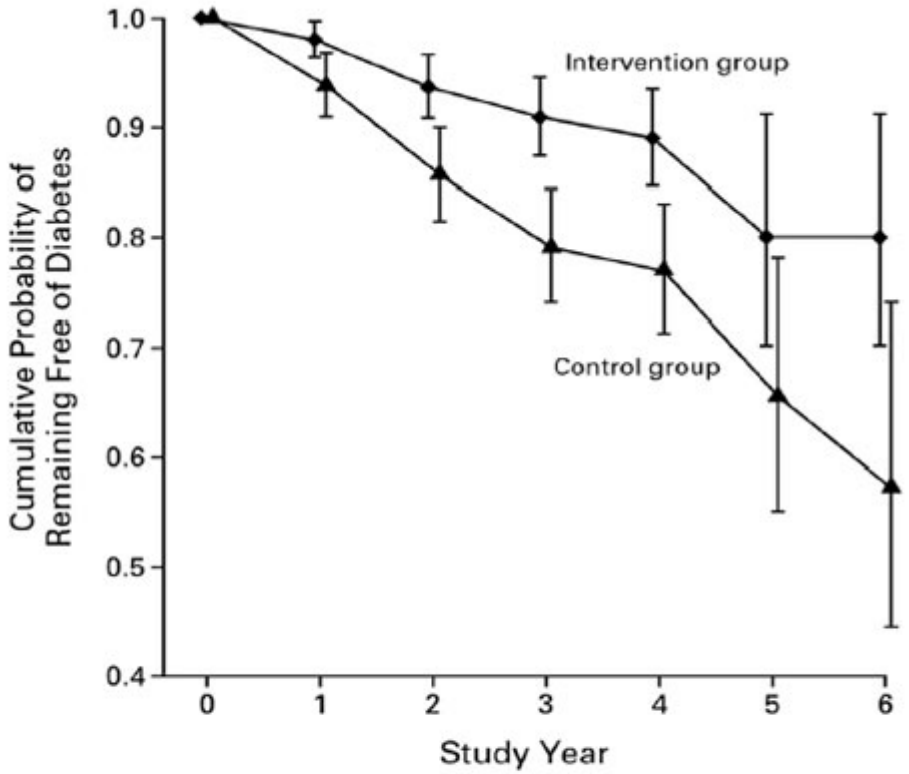
Finnish Diabetes Prevention study



Subjects at Risk						
Total no.	507	471	374	167	53	27
Cumulative no. with diabetes:						
Intervention group	5	15	22	24	27	27
Control group	16	37	51	53	57	59

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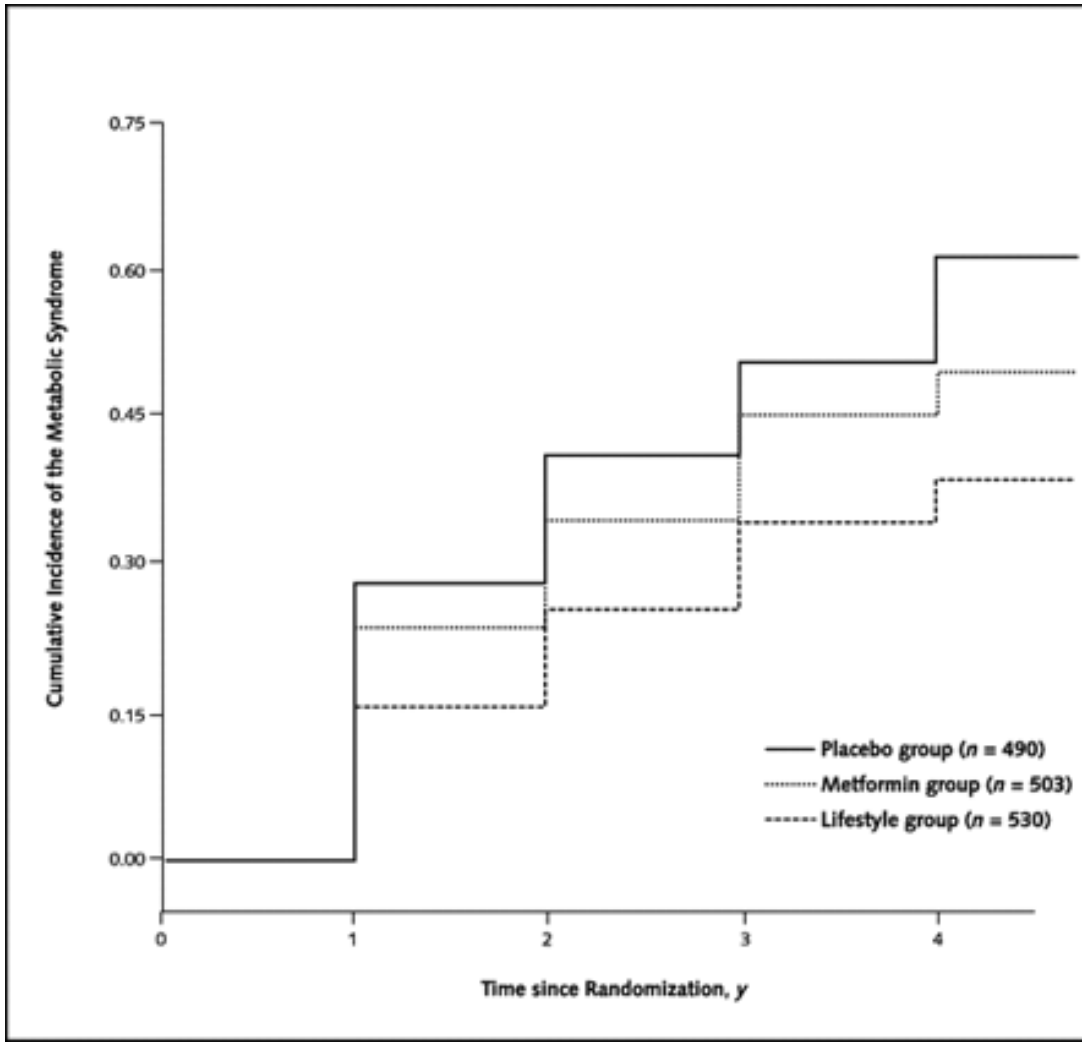
Diabetes Prevention Program 2005



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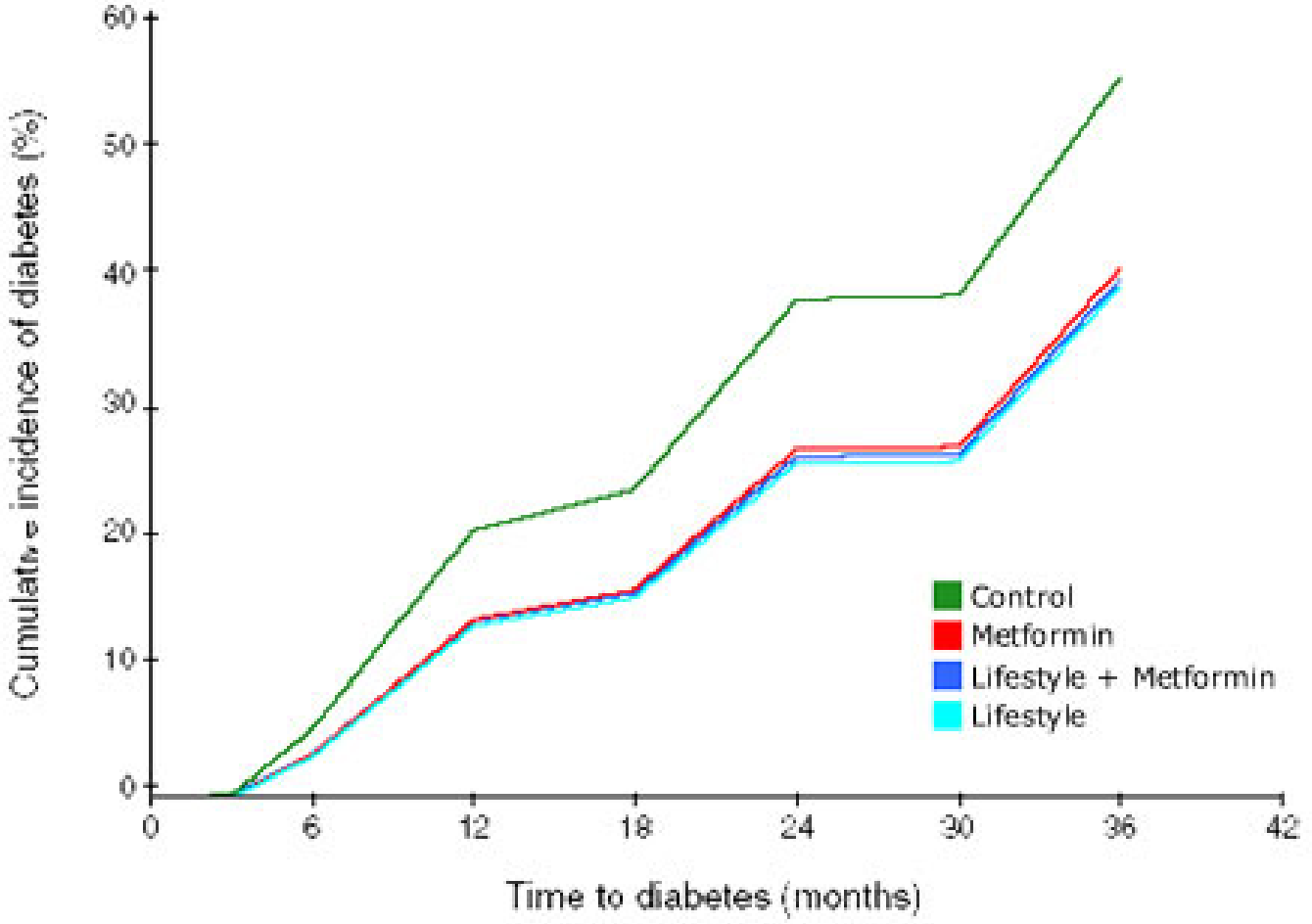
Indian Diabetes prevention study



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Options?

- Ensure all women diagnosed with GDM have a postnatal OGTT (15-20% will have Type 2 diabetes)
- Ensure follow up with ? a fasting blood glucose (1/3rd will develop Type 2 diabetes in next ten years)
- Encourage lifestyle intervention to prevent development of diabetes
- ? Monitor children