Pre-conception care and diabetes
the impact of QoF
The St Vincent Declaration

Achieve a pregnancy outcome in the diabetic woman that approximates that of the non-diabetic woman.

1989
Adverse pregnancy outcomes
A comparison with the population of England, Wales and N Ireland in 2003

Increased risks for babies of women with diabetes
- Stillbirths: 4.7x
- Death of baby in first four weeks: 2.6x
- Major congenital anomaly: 2x

Maternal age-adjusted
*per 1000 total births  **per 1000 live births
Driving forces in care delivery

QoF
- introduced 1 April 2004
- rewards practices financially
- practice achievement against a range of evidence-based clinical indicators

Community Move
Outcome can be influenced
Aim

• provide a snap shot view of the picture of care for patients with Type 2 Diabetes
Method

GPRD audit – to provide volume

- the world's largest computerised database
- anonymised longitudinal medical records from primary care
- currently data are being collected on over 3.6 million active patients
- 488 primary care practices throughout the UK.

An audit of practices – to provide depth

- 12,500 patients with diabetes
- 10,360 on retinal register
- 1009 women aged 14-49
- 60 Practices
- Audited care in 1:3 patients
- Duration 1 month – 12 years
- Median 3 years
Presentation

Local data

GPRD data
Pre-conceptions!!
## Audit Population

<table>
<thead>
<tr>
<th></th>
<th>Cohort Size</th>
<th>Females with diabetes</th>
<th>Study Pop</th>
<th>% Female</th>
<th>Study cohort as % of diabetics</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-2001</td>
<td>1195600</td>
<td>18233</td>
<td>1968</td>
<td>1.5</td>
<td>10.8</td>
</tr>
<tr>
<td>2001-2002</td>
<td>1286698</td>
<td>22070</td>
<td>2437</td>
<td>1.7</td>
<td>11</td>
</tr>
<tr>
<td>2002-2003</td>
<td>1392993</td>
<td>26989</td>
<td>3043</td>
<td>1.9</td>
<td>11.3</td>
</tr>
<tr>
<td>2003-2004</td>
<td>1445211</td>
<td>32061</td>
<td>3703</td>
<td>2.2</td>
<td>11.5</td>
</tr>
<tr>
<td>2004-2005</td>
<td>1471774</td>
<td>36990</td>
<td>4255</td>
<td>2.5</td>
<td>11.5</td>
</tr>
<tr>
<td>2005-2006</td>
<td>1518516</td>
<td>41646</td>
<td>4819</td>
<td>2.74</td>
<td>11.6</td>
</tr>
<tr>
<td>2006-2007</td>
<td>1508304</td>
<td>45073</td>
<td>5263</td>
<td>3</td>
<td>11.7</td>
</tr>
</tbody>
</table>
Percentage of Patients with Diabetes in each age group as a % total in cohort
Ethnicity

![Graph showing ethnicity distribution for Type 1 and Type 2, with the highest number of Caucasian individuals for both types.](image)
Observation 1

• There are significant number of women with diabetes in whom pre-conception care may well play a significant role

• NOT restricted to “ethnic cohorts”

• Within each “practice” they represent an extremely small cohort.
Complications & Co-morbidity
Glycaemic Control

- <6.0%: 39.9%
- 6.0%-7.9%: 0%
- 8.0%-9.9%: 10%
- >10: 20%

**Type 1 Diabetes**
- <6.5%: 7%
- 6.5-8.0: 27%
- 8.0-9.9: 36%
- >10: 22%

**Type 2 Diabetes**
- <6.5%: 6%
- 6.5-8.0: 45%
- 8.0-9.9: 33%
- >10: 15%
Distribution of BMI (% of females in different BMI categories)
Complications

- Hypertensive: 21
- Retinopathy: 5
- Nephropathy: 2
- Neuropathy: 1
- IHD: 4.5
% Hypertension

2000-2001: 23.48
2001-2002: 8
2002-2003: 25
2003-2004: 27
2004-2005: 28
2005-2006: 29
2006-2007: 29
Observation 2

• These ladies are not “fit and healthy”
  – Glycaemic control remains suboptimal in majority
  – Significant numbers have complications that will have an impact on outcome
    – 70% Obese
    – 30% Hypertensive
    – 20% Retinopathy
Therapeutics
Glycaemic Control

![Bar chart showing glycemic control for type 1 and type 2 diabetes.](chart)

![Line graph showing trends over years.](lineChart)

- **<6.0%**
- **6.0%-7.9%**
- **8.0%**

Legend:
- Blue: type 1
- Red: type 2

Yearly data:
- 2000-2001: <6.0%
- 2001-2002: <6.0%
- 2002-2003: <6.0%
- 2003-2004: <6.0%
- 2004-2005: <6.0%
- 2005-2006: <6.0%
- 2006-2007: <6.0%
“Cardiac Drugs”

- **ACE**: Type 2 - 24, Type 1 - 13
- **Statin**: Type 2 - 34, Type 1 - 28
- **aspirin**: Type 2 - 13, Type 1 - 13
- **ARB**: Type 2 - 8.5, Type 1 - 4
Edison et al reviewed 52 U.S. FDA reports of statin exposure during pregnancy that happened between 1987 and 2001. Twenty babies were born with malformations, including:

- 5 severe defects of the central nervous system (2 of which were holoprosencephaly)
- 5 unilateral limb deficiencies
- one patient had both of these malformations

Disease characteristics. Holoprosencephaly (HPE) is a structural anomaly of the brain in which the developing forebrain fails to divide into two separate hemispheres and ventricles. The spectrum of facial anomalies begins with cyclopia and extends in an unbroken continuum to the normal face.
<table>
<thead>
<tr>
<th>Type of contraception</th>
<th>Advantages</th>
<th>Potential problems</th>
</tr>
</thead>
</table>
| **Oral contraceptive pill - 'The Pill'** | *Both the combined pill and the progestogen-only pill (the ‘Mini Pill’) can be used by many women with diabetes and is over 99% effective if used as directed.*  
*Both can make periods lighter and less painful.* | *May cause weight changes, breast tenderness and headaches.* |
| **Injections / Implants**     | *Once given, can be forgotten for 12 weeks to three years (dependent on method) and is over 99% effective.* | *Can cause lighter/heavier periods and weight changes.* |
| **Intrauterine device (IUD) /Mirena coil** | *IUDs do not affect blood glucose levels. The Mirena coil lasts for five years and usually gives light, regular bleeding. It is also over 99% effective.* | *Unlikely to be used for teens / young women unless other methods are not suitable.  
*Can be painful to insert.* |
| **Diaphragm or condom**       | *Mechanical devices do not affect blood glucose levels. They are between 95 and 98% effective if used properly.* | *High failure rate if used incorrectly or they burst.* |
Exposure to ACE inhibitors during the first trimester cannot be considered safe and should be avoided.

Table 4. Alternative Analyses of Risk of Major Congenital Malformations among Study Infants with Fetal Exposure to ACE Inhibitors during the First Trimester Alone. *

<table>
<thead>
<tr>
<th>Alternative Analysis</th>
<th>Any Malformation</th>
<th>Cardiovascular Malformation</th>
<th>Central Nervous System Malformation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.71</td>
<td>1.72–4.27</td>
<td>3.72</td>
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<tr>
<td>Entire study group</td>
<td></td>
<td></td>
<td>1.89–7.30</td>
</tr>
<tr>
<td>ACE inhibitor</td>
<td>2.96</td>
<td>1.83–4.79</td>
<td>4.04</td>
</tr>
<tr>
<td>prescription filled</td>
<td></td>
<td></td>
<td>1.98–8.25</td>
</tr>
<tr>
<td>&gt;14 days after</td>
<td></td>
<td></td>
<td>5.45</td>
</tr>
<tr>
<td>last menstrual period</td>
<td></td>
<td></td>
<td>1.69–17.64</td>
</tr>
<tr>
<td>Broader definition of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>diabetes†</td>
<td>2.77</td>
<td>1.76–4.37</td>
<td>3.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.94–7.49</td>
</tr>
<tr>
<td>Patent ductus</td>
<td>2.51</td>
<td>1.54–4.09</td>
<td>3.35</td>
</tr>
<tr>
<td>arteriosus excluded</td>
<td></td>
<td></td>
<td>1.55–7.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.39</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.37–14.02</td>
</tr>
</tbody>
</table>

* The reference category is infants with no fetal exposure to any antihypertensive medication. The risk ratio is adjusted for potential confounders. Models include maternal age, race, presence or absence of a chronic illness, rural or urban residence, income quartile, and the year of the child's birth. The estimation accounts for clustering due to multiple pregnancies and twins or triplets.

† The broader definition also excludes infants whose mothers had only a single hypoglycemic prescription or one outpatient visit with a diagnosis of diabetes through the first trimester. These women were not considered to have diabetes according to our original definition.
Observation 3

• There has been a significant rise in STATIN USE
• No concomitant change in use of contraception
• Similar patterns are emerging with other “cardio-protective drugs”
• The current emphasis on cardiovascular risk is being applied across the age ranges
Summary

• There are a significant number of women with diabetes aged under 50
• They have significant co-morbidity
• The treatment is aimed at reducing long term cardiovascular disease rather targeting more appropriate age specific risk
Thank you

• This work wouldn’t have been possible without the support and collaboration of
  • ABCD
  • Professor Kamlesh Khunti
  • Bharat Thakrar - Roche
What type of diabetologist are you?

• Type 1 Diabetologist

Give me a doctor underweight, Computerised and up-to-date, A businessman who understands Accountancy and target bands. Who demonstrates sincere devotion To audit and to health promotion - But when my outlook's for the worse Refers me to the practice nurse.

• Type 2 Diabetologist

Give me a doctor, partridge-plump, Short in the leg and broad in the rump, An endomorph with gentle hands, Who'll never make absurd demands That I abandon all my vices, Nor pull a long face in a crisis, But with a twinkle in his eye Will tell me that I have to die