Obesity in Pregnancy
What to do?

A. Prof Glyn Teale
Conflicts of interest / Disclosures

• Sadly... none
• Dual national

Caveats

• Obesity risks are relevant to ALL levels of Obesity ….
  • Not just the extremes
  • I may leave you with more questions than answers.....
  • Welcome to my world!
Outline

Nature of the problem

Causes

Implications

Why is it important to you?

• Stillbirth rates
• LSCS rates

Some aspects of pregnancy care of the obese woman
Guidelines aren’t really guiding us!

Limited RCT evidence to guide practice

• Might explain why peak bodies have not reissued guidance
  • CMACE / RCOG Joint Guideline
    • Management of women with obesity in pregnancy 2010

• Victorian Guideline in development – review nearly complete
  • My thoughts here might not agree with what will come into the guideline

• RANZCOG Obesity in Pregnancy statement March 2017
3rd high

“If more than 50% of the population is obese, then I’m not overweight, I’m average!”

Figure 1: Proportion of overweight and obese. Modified from Wang et al., (2011)
Causes

“The handle on your recliner does not qualify as an exercise machine.”

America’s Rising Obesity Rate

1980: 15%  
1990: 22%  
2000: 31%  
2008: 34%

Percent of obese Americans
Of the bugs that shape us: maternal obesity, the gut microbiome, and long-term disease risk

Wajiha Gohir, Elyanne M. Ratcliffe and Deborah M. Sloboda

Pediatric RESEARCH Volume 77 | Number 1 | January 2015

a
Prepregnancy
Normal gut microbiota

Pregnancy
Maternal gut microbiota
Fetal gut microbiota
Healthy metabolic outcome

Offspring

b
Prepregnancy
Disrupted gut microbiota

Pregnancy
Maternal gut microbiota
Fetal gut microbiota
Adverse metabolic outcome

Firmicutes
Bacteroidetes
Actinobacteria
Proteobacteria
BMI trends of Victorian mothers during pregnancy 2010 - 2015

Health service profile: Sunshine Hospital

Safer Care Victoria
Class II/III – 8.6% to 12.8%
### RANZCOG Obesity in Pregnancy statement March 2017

<table>
<thead>
<tr>
<th>Variable</th>
<th>BMI &lt;18.5</th>
<th>BMI 18.5-25</th>
<th>BMI 25-30</th>
<th>BMI 30-35</th>
<th>BMI 35-40</th>
<th>BMI &gt;40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension in pregnancy</td>
<td>1%</td>
<td>2%</td>
<td>3%</td>
<td>5%</td>
<td>7%</td>
<td>10%</td>
</tr>
<tr>
<td>Gestational diabetes</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
<td>3%</td>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td>Type 1 or 2 diabetes</td>
<td>0.2%</td>
<td>0.5%</td>
<td>0.3%</td>
<td>2%</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>Spontaneous vaginal birth</td>
<td>61%</td>
<td>55%</td>
<td>50%</td>
<td>47%</td>
<td>47%</td>
<td>44%</td>
</tr>
<tr>
<td>Assisted vaginal birth</td>
<td>13%</td>
<td>13%</td>
<td>10%</td>
<td>8%</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Caesarean birth</td>
<td>26%</td>
<td>33%</td>
<td>40%</td>
<td>45%</td>
<td>47%</td>
<td>52%</td>
</tr>
<tr>
<td>Perinatal death</td>
<td>0.5%</td>
<td>0.7%</td>
<td>1%</td>
<td>1%</td>
<td>1.5%</td>
<td>2%</td>
</tr>
<tr>
<td>Neonatal Mechanical Ventilation</td>
<td>6%</td>
<td>5%</td>
<td>6%</td>
<td>7%</td>
<td>9%</td>
<td>10%</td>
</tr>
<tr>
<td>Preterm birth (&lt;37 weeks)</td>
<td>9%</td>
<td>7%</td>
<td>8%</td>
<td>9%</td>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>Macrosomia</td>
<td>5%</td>
<td>11%</td>
<td>16%</td>
<td>19%</td>
<td>20%</td>
<td>21%</td>
</tr>
<tr>
<td>SGA (customised)</td>
<td>12%</td>
<td>11%</td>
<td>12%</td>
<td>13%</td>
<td>16%</td>
<td>19%</td>
</tr>
<tr>
<td>LGA (customised)</td>
<td>11%</td>
<td>11%</td>
<td>13%</td>
<td>13%</td>
<td>14%</td>
<td>16%</td>
</tr>
</tbody>
</table>
Figure 4: Rate of caesarean section by maternal BMI, Sunshine Hospital, compared to state-wide public, 2010-2015
Obesity and the risk of stillbirth: a population-based cohort study

Ruofan Yao, MD, MPH; Cande V. Ananth, PhD, MPH; Bo Y. Park, MPH; Leanne Pereira, MD; Lauren A. Plante, MD MPH; for the Perinatal Research Consortium

Am J Obstet Gynecol 2014;
Obesity and the risk of stillbirth: a population-based cohort study

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Am J Obstet Gynecol 2014;

The change in hazard ratio trend for each body mass index (BMI) class defined as the gestational period increases.
Small babies are at an increasingly greater risk of stillbirth in larger women

Yao et al 2016 AJOG (n = 214052)
In obese women LGA reduces stillbirth

‘Maternal obesity is not associated with stillbirth or neonatal death amongst infants born LGA’

Yao et al 2016 AJOG (n = 236017)
What to do?

Don’t be fooled …. Not low risk
Exercise and diet advice
Close surveillance
Extra reviews
More tests
More intervention
18 Bazillion Benefits of Exercise During Pregnancy

Working out while pregnant is a win for both you and Baby. Here are the best exercises for you—and some tips on how hard you can push it when getting your sweat on.
Exercise during pregnancy

Safe for most women except for extreme health issues

**NOT** associated with:

- preterm delivery, birth weight reduction, pH changes, low Apgars

Reduced risk of macrosomia, GDM, PET, LSCS, low back pain,

**Conclusions**
Pregnancy is no longer considered a state of confinement; an active lifestyle during pregnancy is safe and beneficial. Most medical and scientific organizations promote physical activity in all phases of life, including pregnancy.
The list is quite noteworthy. To our knowledge, there is no intervention that we as providers can recommend to pregnant women as impressive in its significant impact on so many maternal and perinatal outcomes.
TABLE 2
Examples of types of exercises that have been extensively studied in pregnancy and found to be safe and beneficial

| Walking |
| Stationary cycling |
| Aerobic exercises |
| Dancing |
| Resistance (e.g., weights, elastic bands) exercises |
| Stretching exercises |
| Hydrotherapy, water aerobics |

TABLE 3
Characteristics of a safe and effective exercise regimen in pregnancy

<table>
<thead>
<tr>
<th>When to start</th>
<th>First trimester, &lt;12 weeks gestation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of a session</td>
<td>30-60 minutes</td>
</tr>
<tr>
<td>Times per week</td>
<td>At least 3–4 (up to daily)</td>
</tr>
<tr>
<td>Intensity of exercise</td>
<td>&lt;60–80% of age-predicted maximum maternal heart rate$^a$</td>
</tr>
<tr>
<td>Self-reported intensity of exercise (Borg scale)$^b$</td>
<td>Moderate intensity (12–14 on Borg scale)</td>
</tr>
<tr>
<td>Supervision of exercise</td>
<td>Preferred, if available</td>
</tr>
<tr>
<td>When to end</td>
<td>Until delivery (as tolerated)</td>
</tr>
</tbody>
</table>

$^a$ Usually not exceeding 140 beats per minute; $^b$ Borg scale is a 15-category scale (from 6 to 20) to measure the level of perceived exertion; light exercise is approximately 6–11; 13 is somewhat hard; 15 is hard; 19 is extremely hard.
Weight change - Class 3 Obesity

RESULTS: Among class 3 obese women, GWG below -2 kg compared to GWG within IOM guidelines was associated with lower odds of: large for gestational age infants OR=0.44 (0.27 - 0.71), preeclampsia/eclampsia OR=0.51 (0.26 - 0.93), cesarean section OR=0.50 (0.35 - 0.71), NICU admission OR 0.70 (0.45 - 1.08) and LOS greater than 3 days OR=0.53 (0.28 - 0.76), but higher odds of small for gestational age OR=2.61 (1.11 - 6.20). Findings were similar for other obesity classes.

CONCLUSION: Weight loss among severely obese women is associated with improved perinatal outcomes, and higher risk of small for gestational age infants, but without the increased risk of other poor neonatal outcomes.

Wilkins, Emilia MD, MPH; Alabaster, Amy MPH; Gunderson, Erica PhD, MS, MPH Obstetrics & Gynecology: May 2017
Maternity and newborn care

Antenatal visit before 12 weeks gestation

Percentage of women birthing at a hospital who received antenatal care by a maternity care provider before 12 weeks gestation

Inspire

July 2017

Western Health

2016-17 Q2
More of the same

Early GTT
Vit D screen and repeat
Routine assessment of iron stores – aim for ferritin >30
Repeat GTT at 26-28 weeks
Decreased fetal movement discussion and repeat and repeat and repeat and repeat
Ensure appropriate response to presentation with DFM
Growth assessment

What is the right thing to do?

Routine USS?
- Current state guideline – scan at 35/40 for BMI >35
Repeat scanning?
When?

FSH useless

Worse than useless?
- Dangerous?
How long is too long to remain pregnant?

The change in hazard ratio trend for each body mass index (BMI) class defined as the gestational period increases.
The risks of stillbirth & neonatal death with each additional week of expectant management compared with delivery among women of different obesity class

Yao et al AJOG 2017
Induction of Labor and Cesarean: What is the True Relationship?

SARAH E. LITTLE, MD, MPH,* and AARON B. CAUGHEY, MD, MPP, MPH, PHD†

*Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Maternal-Fetal Medicine, Brigham and Women’s Hospital, Boston, Massachusetts; and †Department of Obstetrics and Gynecology, Oregon Health & Science University, Portland, Oregon
The effect of the MFM obesity protocol on cesarean delivery rates

Schuster M, Madueke-Laveaux OS, Mackeen AD, et al
AJOG OCTOBER 2016

Protocol includes –

- GDM screening, serial growth scans, antenatal CTG (undefined)

Delivery by the estimated due date:

- Class III obese alone
- Class II obese and a diagnosis of GDM or large for gestational age,
- Class I obese plus a diagnosis of GDM and large for gestational age
The effect of the MFM obesity protocol on cesarean delivery rates

Schuster M, Madueke-Laveaux OS, Mackeen AD, et al
AJOG OCTOBER 2016

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obesity protocol</th>
<th>Before</th>
<th>After</th>
<th>P value</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Nonobese pregnant women</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>2084</td>
<td>836</td>
<td>1248</td>
<td></td>
</tr>
<tr>
<td>Delivery type</td>
<td>Cesarean delivery</td>
<td>249</td>
<td>277</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td></td>
<td>Vaginal delivery</td>
<td>587</td>
<td>971</td>
<td></td>
</tr>
</tbody>
</table>

| Delivery type              | Cesarean delivery| 249 (29.8%) | 277 (22.2%) | < .0001 |
|                            | Vaginal delivery  | 587 (70.2%) | 971 (77.8%) |         |
Term Elective Induction of Labor and Risk of Cesarean Delivery in Obese Women

Lee et al.

Retrospective cohort study of singleton, vertex, nonanomalous deliveries among obese women (BMI $\geq 30$)

N > 70,000

LSCS risk of IOL c.f. expectant management NULLIPAROUS WOMEN

37 weeks OR 0.55, (CI 0.34–0.90)

39 weeks OR 0.77, (CI 0.63–0.95)
Caesarean risk in obese women at term: a retrospective cohort analysis
Nugent, de Costa & Vangaveti ANZJOG Aug 2017

<table>
<thead>
<tr>
<th>Gestation</th>
<th>IOL</th>
<th>Expectant</th>
</tr>
</thead>
<tbody>
<tr>
<td>37 weeks</td>
<td>0.417-3.710</td>
<td>0.260-1.710</td>
</tr>
<tr>
<td>38 weeks</td>
<td>0.667 (0.260-1.710)</td>
<td>0.345-1.587</td>
</tr>
<tr>
<td>39 weeks</td>
<td>0.740 (0.345-1.587)</td>
<td>1.457 (0.496-4.278)</td>
</tr>
<tr>
<td>40 weeks</td>
<td>1.457 (0.496-4.278)</td>
<td></td>
</tr>
</tbody>
</table>
Birthing

Is there an optimal IOL procedure?
Treat as normal in labour?

Intrapartum care

One plan fits all?

Individualise

• IV access
• active Mx 3rd stage
• leave for longer?
Effect of obesity on the labour curve
Norman et al Obstet Gynecol 2012
Caesarean techniques for obese women

- Right surgeon
- Prophylactic antibiotics BEFORE LSCS
- Altered approach
- Benefit from vacuum dressing unclear
  - And not cheap
Traxi

Without traxi
Difficult to locate or access surgical site
Suprapannus transverse incision in morbidly obese women
‘Maternal obesity is not associated with stillbirth or neonatal death amongst infants born LGA’