Labor Management for Patients with Obesity

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Management of Spontaneous Labor, Augmentation and Induction of Labor

- Rationale for IOL: why, timing, predicting success & counselling
- Review the unique characteristics of labor & the biophysiology of labor
- Pragmatic & evidence based approach to labor management
  - Cervical ripening
  - Timing for AROM
  - Use of oxytocin: dose, duration
  - Role for FSE & IUPC
  - Monitoring progress
  - Setting expectations: patient & OB provider
  - TOLAC

Definition of Obesity:
BMI > 30
Class I: 30-34.5
Class II: 35-39.5
Class III: > 40
Rationale for Induction in Patients with Obesity

#1: Pre-existing or Pregnancy Related Morbidity
- Pre-existing DM
- GDM
- Chronic BP
- PET/PH
- Macrosomia

Inc: IUGFR, SGA, VTE

#2: Increased Rate of Post Dates Pregnancy

As BMI increased, the odds of spontaneous labor progressively decreased.

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Ref</th>
<th>25</th>
<th>25-29.9</th>
<th>30-34.9</th>
<th>35-39.9</th>
<th>≥ 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>37</td>
<td>0.66 (0.54-0.81)</td>
<td>0.53 (0.42-0.66)</td>
<td>0.52 (0.40-0.68)</td>
<td>0.42 (0.31-0.57)</td>
<td></td>
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</tr>
<tr>
<td>38</td>
<td>0.81 (0.68-0.96)</td>
<td>0.54 (0.53-0.76)</td>
<td>0.50 (0.40-0.62)</td>
<td>0.40 (0.31-0.51)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>0.85 (0.71-1.00)</td>
<td>0.64 (0.55-0.76)</td>
<td>0.53 (0.43-0.63)</td>
<td>0.41 (0.33-0.51)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>0.85 (0.67-1.06)</td>
<td>0.62 (0.50-0.81)</td>
<td>0.51 (0.39-0.66)</td>
<td>0.50 (0.38-0.64)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>0.99 (0.58-1.67)</td>
<td>0.70 (0.41-1.19)</td>
<td>0.70 (0.40-1.22)</td>
<td>0.56 (0.31-1.07)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#3: Increased Rate of IUFD through gestation & @term

- Risk of IUFD greatest after 39w GA
- Determining optimal timing of induction
  - Greatest chance for Vaginal Birth
  - Lowest risk of Unplanned C/S
  - Lowest risk of Adverse Perinatal Outcome
### Optimal Timing of Induction in Patients with BMI >30

#### 39w
- Cesarean delivery: 0.87 (0.77–0.98)
- Operative vaginal delivery: 1.16 (1.04–1.31)
- Severe maternal morbidity*: 0.76 (0.48–0.87)
- Infant death: 0.23 (0.03–1.68)
- NICU admission: 0.70 (0.70–0.89)
- Macrosomia: 0.26 (0.19–0.34)
- Chorioamnionitis: 0.56 (0.47–0.66)
- Meconium aspiration syndrome: 0.35 (0.29–0.42)
- Respiratory distress syndrome: 0.39 (0.10–1.23)
- Shoulder dystocia: 1.4 (0.87–1.48)
- Breech plexus injury: 0.41 (0.15–1.22)

#### 40w
- Cesarean delivery: 0.85 (0.80–0.90)
- Operative vaginal delivery: 1.07 (1.05–1.10)
- Severe maternal morbidity*: 0.84 (0.75–0.94)
- Infant death: 0.75 (0.20–1.95)
- NICU admission: 0.84 (0.76–0.94)
- Macrosomia: 0.50 (0.39–0.63)
- Chorioamnionitis: 0.61 (0.55–0.69)
- Meconium aspiration syndrome: 0.35 (0.29–0.42)
- Respiratory distress syndrome: 0.82 (0.77–0.87)
- Shoulder dystocia: 1.3 (0.69–1.56)
- Breech plexus injury: 0.90 (0.48–1.70)

#### 41w
- Cesarean delivery: 0.87 (0.75–1.00)
- Operative vaginal delivery: 1.14 (0.95–1.35)
- Severe maternal morbidity*: 0.69 (0.60–0.73)
- Infant death: 0.69 (0.49–0.99)
- NICU admission: 0.69 (0.49–0.99)
- Macrosomia: 0.69 (0.51–0.98)

*Greatest chance of vaginal birth
Lowest risk of adverse maternal & neonatal outcome

Gibbs Pickens CM et al; OBGYN 2018

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### ACOG May 2023

<table>
<thead>
<tr>
<th>Cesarean delivery</th>
<th>Rate of C/S:</th>
<th>19.7%</th>
<th>v</th>
<th>24.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>nulliparous &amp; parous patients</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BMI &lt;35 and ≥35</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Lowest Rate of:**
- Chorioamnionitis
- Perinatal death
- Macrosomia
- 3rd & 4th degree laceration
- Apgar <7 @5min
- Endometritis & Wound Infection
- Meconium aspiration

**IOL at @39-39.5w GA associated with greatest rate of vaginal birth and lowest risk of adverse perinatal outcome**
Can the event of failed labor be predicted?

Is BMI alone the best predictor of successful OL?

Maternal Factors in addition to BMI associated with failed induction of labor:

<table>
<thead>
<tr>
<th>Predictive Factor</th>
<th>Failed IOL (n=273,184)</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior vaginal birth</td>
<td>63.725 (23.3)</td>
<td>0.71 (0.71-0.81)</td>
</tr>
<tr>
<td>Prior cesarean birth</td>
<td>10.550 (5.6)</td>
<td>0.98 (0.87-1.09)</td>
</tr>
<tr>
<td>Maternal height (inches)</td>
<td>64.2±2.9</td>
<td>0.88 (0.87-0.99)</td>
</tr>
<tr>
<td>Maternal age (y)</td>
<td>27.8±6.0</td>
<td>1.05 (1.05-1.06)</td>
</tr>
<tr>
<td>Maternal weight at delivery (lb)</td>
<td>244±41</td>
<td>1.00 (1.00-1.008)</td>
</tr>
<tr>
<td>Parity</td>
<td>1 (0-2)</td>
<td>0.90 (0.89-0.91)</td>
</tr>
<tr>
<td>Gestational weight gain (lb)</td>
<td>28.6±17.8</td>
<td>1.00 (1.00-1.005)</td>
</tr>
<tr>
<td>Medicaid</td>
<td>125.770 (47.8)</td>
<td>1.17 (1.17-1.18)</td>
</tr>
<tr>
<td>Pregnancy diabetes</td>
<td>7.366 (2.7)</td>
<td>1.64 (1.59-1.70)</td>
</tr>
<tr>
<td>Chronic hypertension</td>
<td>17.443 (6.4)</td>
<td>1.15 (1.12-1.17)</td>
</tr>
</tbody>
</table>

IOL, induction of labor; OR, odds ratio.
Data are n (%), mean±SD, or median (interquartile range) unless otherwise specified.
Case Example

35yo G2P1 with BMI 43, previous SVD

35yo G1P0 with BMI 43, no previous SVD

https://ob.tools/obesity-iol-calc
The Edmonton Obesity Scoring System Predicts Mode of Delivery after IOL

For patients with BMI $>25$, an EOSS score was assigned

Prospective Cohort Study (n=345)

? Should ALL patients with obesity be induced at 39w gestation

Maternal Intraoperative Complications: not increased with BMI

Maternal Post-operative complications: increase with BMI
For patients with BMI >40 (class III, super obese)

- (A) Anticipated vaginal birth versus planned cesarean
- (C) Successful vaginal birth versus intrapartum cesarean in those attempting a vaginal birth

- ↑ Post partum hemorrhage
- ↓ Wound complications

No differences: wound infection, VTE, Apgar <6@5 min, cord pH<7.1, NICU admit

There is an equipoise of understanding which is “optimal mode of delivery” with BMI >40: IOL versus Planned C/S

Need an RCT to determine optimal mode of delivery

? What is the expected duration of the latent phase: how to measure progress

As BMI increases, duration of latent phase increases

<table>
<thead>
<tr>
<th>Maternal body mass index (kg/m²)</th>
<th>Quartiles</th>
<th>Time from admission to start of active phase in hours (N = 15 073)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>25%</td>
</tr>
<tr>
<td>&lt;18.5</td>
<td>322</td>
<td>7.7</td>
</tr>
<tr>
<td>18.5-24.9</td>
<td>8434</td>
<td>8.4</td>
</tr>
<tr>
<td>25-29.9</td>
<td>3993</td>
<td>9.2</td>
</tr>
<tr>
<td>30-34.9</td>
<td>1568</td>
<td>9.6</td>
</tr>
<tr>
<td>35-39.9</td>
<td>549</td>
<td>10.2</td>
</tr>
<tr>
<td>&gt;40</td>
<td>207</td>
<td>11.1</td>
</tr>
</tbody>
</table>

24-36h day for cervix to ripen
? What is the expected duration of the active phase

Active labor: same rate of vaginal birth**
longer duration

<table>
<thead>
<tr>
<th>Cx &gt; 4cm</th>
<th>Duration of the active phase of labor in hours (N = 15259)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quartiles</td>
</tr>
<tr>
<td>Maternal body mass index (kg/m²)</td>
<td>N</td>
</tr>
<tr>
<td>&lt;18.5</td>
<td>325</td>
</tr>
<tr>
<td>18.5-24.9</td>
<td>1059</td>
</tr>
<tr>
<td>25-29.9</td>
<td>4044</td>
</tr>
<tr>
<td>30-34.9</td>
<td>1605</td>
</tr>
<tr>
<td>35-39.9</td>
<td>562</td>
</tr>
<tr>
<td>≥40</td>
<td>214</td>
</tr>
</tbody>
</table>

Carlhallet al 2019 AOGS

DRAFT: BMI Specific Partogram

PARTOGRAPH

Alert
Action

2cm / hour with optimal uterine activity
? What is the expected duration of the second stage

<table>
<thead>
<tr>
<th>BMI (kg/m²)</th>
<th>N (57,500)</th>
<th>Duration of the second stage in hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Quartiles</td>
</tr>
<tr>
<td>&lt;18.5</td>
<td>1890</td>
<td>0.35</td>
</tr>
<tr>
<td>18.5–24.9</td>
<td>39,241</td>
<td>0.35</td>
</tr>
<tr>
<td>25–29.9</td>
<td>12,192</td>
<td>0.32</td>
</tr>
<tr>
<td>30–34.9</td>
<td>3093</td>
<td>0.30</td>
</tr>
<tr>
<td>35–39.9</td>
<td>845</td>
<td>0.32</td>
</tr>
<tr>
<td>&gt;40</td>
<td>239</td>
<td>0.27</td>
</tr>
</tbody>
</table>

BMI = body mass index.

Note: Conflicting studies but most favor no difference in length of 2nd stage
BUT
Increase rate of C/S (most commonly 2a Abnormal FHR)
Decreased rate of Operative Vaginal Birth

? Why do patients with obesity have labor dystocia

Adipose tissue
- Increased leptin production

Placenta
- Increased leptin production
- Altered placental preparation for labor
- Estrogen/progesterone signalling changes
- Prostaglandin PGE2 insensitivity

Myometrium
- Decreased gap junction formation
- Decreased oxytocin receptor expression
- Decreased myometrial action potential size and duration
- Lipotoxicity > increased reactive oxygen species

Cervix
- Disrupted cervical ripening

Amnion
- Decreased normal spontaneous rupture of membranes

** Effect of leptin
- Blocks action of oxytocin
- Blocks collagen degradation
- Chronic inflammation & PGE2 production (down regulates responsiveness)

Carlson N et al, Repro Bio Endo, 2015
1. Impaired tissue response
- lower OTR
- OTR blocked by leptin
- impaired myometrial contractility

2. Dilutional effect
- increased maternal blood volume
Pragmatic Approach to Induction & Labour Management

Delivery Plan & Counselling

1. Plan for IOL at 39-39\textsuperscript{6}w GA
   * earlier if indicated by pregnancy or pre-pregnancy co-morbidity
2. Recalculate BMI at 36w GA
3. @38w GA: perform pelvic assessment for Bishop score
   ** not part of BMI Predictor Tools BUT.....
4. Calculate chance of success to guide IOL choice
   - BMI > 40 or >50 + unripe Cx
   - BMI > 60
   - E OSS 3
   Consider elective C/S
5. Discuss and document expectations & risks
   - mean time for Cx ripening
   - mean time to delivery
   - chance of C/S
   - C/S counselling (incision, risks, dressing, ppABx, mVTE)

** Informed, values based patient choice for mode of delivery

% Successful IOL by BMI and Bishop Score
** What is most effective mode of cervical ripening

** very few studies, very small samples sizes

<table>
<thead>
<tr>
<th>Method Combination</th>
<th>Outcome</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foley™ + Vaginal PGE1 vs Vaginal PGE1 alone</td>
<td>No difference in C/S rates *</td>
<td>* High baseline rate</td>
</tr>
<tr>
<td>Foley™ vs Vaginal PGE1 vs Vaginal PGE2</td>
<td>No difference in C/S rates *</td>
<td></td>
</tr>
<tr>
<td>Vaginal PGE1 vs Oral PGE1</td>
<td>Faster time to Bishop score &gt;3 and to delivery</td>
<td></td>
</tr>
<tr>
<td>Foley™ followed by Oral PGE1 vs Oral PGE1</td>
<td>Lower rate of C/S</td>
<td></td>
</tr>
<tr>
<td>Foley™ vs Vaginal PGE2</td>
<td>Shorter time to delivery &amp; increased satisfaction</td>
<td></td>
</tr>
</tbody>
</table>

No consensus on optimal of mode of cervical ripening

Kehl et al, Eur J OB GYN Repro Bio 2019
Viteri et al, Am J Perinatol, 2020
Soni et, J Mat Fet Neonat Med, 2020
Lauterbach et al,…

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Cervical Ripening & Labor Induction

<table>
<thead>
<tr>
<th>Study</th>
<th>ORAL PGE1 25μg q4h</th>
<th>NR</th>
<th>ORAL PGE1 25μg q4h + Foley™ catheter</th>
<th>NR</th>
<th>Higher rates of vaginal birth within 24h</th>
<th>Lower rates of C/S</th>
<th>* No difference in the rates of adverse maternal &amp; neonatal events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successfull outcome (delivery within 24 hr)</td>
<td>76 (87.4%)</td>
<td>57 (75.0%)</td>
<td>.02</td>
<td>Higher rates of vaginal birth within 24h</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaginal delivery after 24 hr of induction</td>
<td>11 (12.6 %)</td>
<td>19 (25.0%)</td>
<td>.49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total vaginal delivery</td>
<td>87</td>
<td>76</td>
<td>.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOSD</td>
<td>13</td>
<td>24</td>
<td>.04</td>
<td>Lower rates of C/S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fetal distress</td>
<td>3 (23%)</td>
<td>9 (37.5%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failed progress of labor</td>
<td>10 (77%)</td>
<td>15 (82.5%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrumental delivery</td>
<td>3</td>
<td>2</td>
<td>.56</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Combination of FoleyTM and ORAL misoprostol is safe & effective for all comers

Note: Myometrium less sensitive of PGE2 due to chronic exposure
PGE1 has more potent binding receptor & myometrial effect than PGE2

Anjali et al, AJOG, 2022
SOGC Guideline 2022
Longer duration & greater dose of PGE1 with increasing BMI

BUT

76% of inductions ended with a successful vaginal birth

** Registered RCT in USA: Misoprostol Dosing in BMI Greater Than 30
RCT 25mcg versus 50 mcg for labor induction

** Hypothesis: PGE1 + Foley™ may be an optimized first line mode of labor induction in patients with obesity
Timing of AROM

<table>
<thead>
<tr>
<th>For BMI &gt;40</th>
<th>&lt; 4cm</th>
<th>&gt; 4cm</th>
<th>Early Amniontomy associated with:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome</td>
<td>Early amniontomy, n = 187</td>
<td>Late amniontomy, n = 178</td>
<td>OR (95% CI)</td>
</tr>
<tr>
<td>Cesarean delivery</td>
<td>34 (18.5%)</td>
<td>34 (18.9%)</td>
<td>2.34 (1.43–3.84)</td>
</tr>
<tr>
<td>Prolonged labor</td>
<td>18 (9.6%)</td>
<td>12 (6.6%)</td>
<td>2.74 (1.27–5.96)</td>
</tr>
<tr>
<td>Maternal composite</td>
<td>29 (15.6%)</td>
<td>41 (23.1%)</td>
<td>1.24 (0.72–2.18)</td>
</tr>
<tr>
<td>PPH</td>
<td>11 (6.5%)</td>
<td>15 (8.4%)</td>
<td>1.25 (0.65–2.38)</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>2 (1.2%)</td>
<td>2 (1.2%)</td>
<td>1.08 (0.22–5.98)</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
<td>15 (5.0%)</td>
<td>7 (0.0%)</td>
<td>1.5 (0.59–4.81)</td>
</tr>
<tr>
<td>Endometritis</td>
<td>2 (1.9%)</td>
<td>1 (0.6%)</td>
<td>1.68 (1.23–12.18)</td>
</tr>
<tr>
<td>Wound infection</td>
<td>2 (1.9%)</td>
<td>1 (0.6%)</td>
<td>1.68 (1.23–12.18)</td>
</tr>
<tr>
<td>YFE</td>
<td>0 (0%)</td>
<td>1 (0.6%)</td>
<td>1.08 (0.22–5.98)</td>
</tr>
<tr>
<td>Maternal death</td>
<td>0 (0%)</td>
<td>1 (0.6%)</td>
<td>1.08 (0.22–5.98)</td>
</tr>
<tr>
<td>Neonatal death</td>
<td>10 (5.7%)</td>
<td>22 (12.4%)</td>
<td>1.33 (0.79–2.28)</td>
</tr>
<tr>
<td>NICU admission &gt; 24 hours</td>
<td>10 (5.7%)</td>
<td>16 (9.8%)</td>
<td>1.52 (0.71–3.26)</td>
</tr>
<tr>
<td>Ventilation &gt; 24 hours</td>
<td>2 (1.9%)</td>
<td>6 (3.4%)</td>
<td>0.55 (0.11–2.76)</td>
</tr>
<tr>
<td>Suspected asphyxia</td>
<td>1 (0.8%)</td>
<td>0 (0.0%)</td>
<td>2.24 (0.41–6.21)</td>
</tr>
<tr>
<td>Grade 3 or 4 DUN</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>1.00 (0.00–1.00)</td>
</tr>
<tr>
<td>HIE</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>1.00 (0.00–1.00)</td>
</tr>
<tr>
<td>RDS</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>1.00 (0.00–1.00)</td>
</tr>
<tr>
<td>Seizures</td>
<td>0 (0%)</td>
<td>1 (0.6%)</td>
<td>1.00 (0.00–1.00)</td>
</tr>
<tr>
<td>CPR</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>1.00 (0.00–1.00)</td>
</tr>
<tr>
<td>NEC</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>1.00 (0.00–1.00)</td>
</tr>
<tr>
<td>Fetal death</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>1.00 (0.00–1.00)</td>
</tr>
</tbody>
</table>

Pasko et al, SMFM 2018

Anecdotal Experience with Foley + PGE1: Wait for effacement and some UC before AROM with PGE1 IOL

Use of Oxytocin for Augmentation and/or Induction

<table>
<thead>
<tr>
<th>Labor induction</th>
<th>Normal weight, N = 215 (8.6%)</th>
<th>Overweight, N = 767 (30.6%)</th>
<th>Class I obesity, N = 717 (28.6%)</th>
<th>Class II obesity, N = 433 (17.3%)</th>
<th>Class III obesity, N = 374 (14.9%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max oxytocin &gt; 20 mlU/min</td>
<td>8 (3.7)</td>
<td>26 (3.4)</td>
<td>18 (2.5)</td>
<td>11 (4.8)</td>
<td>25 (6.7)</td>
<td>0.005</td>
</tr>
<tr>
<td>Highest rate of oxytocin (muU/min)</td>
<td>8.0 (1.0–3.0.0)</td>
<td>10.0 (1.0–3.40)</td>
<td>10.0 (1.0–3.0.0)</td>
<td>12.0 (1.0–3.0.0)</td>
<td>12.0 (1.0–3.0.0)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Average oxytocin dosage (muL)</td>
<td>2.9583 (112.5–4.47.90)</td>
<td>3.9050 (36.0–5.003.0)</td>
<td>3.696 (21.0–5.481.5)</td>
<td>4.360 (166.0–48.523.6)</td>
<td>5.2430 (128.0–31.213.6)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Duration of oxytocin (h)</td>
<td>9.1 (0.73–45.6)</td>
<td>11.3 (0.52–62.2)</td>
<td>11.1 (0.23–58.1)</td>
<td>11.2 (1.38–59.4)</td>
<td>12.5 (1.77–47.1)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Same pattern observed for labor augmentation

Rate, Dose & Duration of Oxytocin Increased with Maternal BMI

Need more to get same effect !

Adams et al, Am J Perinat 2018
**How to use higher doses of oxytocin safely**

**In-Use Oxytocin Safety Checklist**

This checklist should be successfully completed every 30 minutes (+/- 10 min) while oxytocin is in use.

If this checklist cannot be completed, oxytocin must be decreased or stopped.

- **Continuous Electronic Fetal Monitoring (CEFM) Assessment**:
  - Normal EFM tracing for each of the 2 15-minute (not 5-minute) segments of the CEFM is the test range within normal range, intermediate variability, no or non-frequent uncompleted decelerations.
  - No more than 1, 15-minute segment where the EFM is flat.
  - No more than 2 complete longer uncompleted decelerations within the previous 30 minutes.

- **Uterine Contractions**:
  - No more than 5 contractions in a 15-minute window, averaged over 24 hours.
  - No contractions with a duration greater than 30 seconds.
  - Uterine contractions that exceed contractions for a minimum of 90 seconds.
  - If an intravenous pressure catheter (IUPC) is in place, measured uterine resting time is less than 10 minutes for at least 30 minutes between each contraction.

**Use of internal monitoring increases with BMI**

**Infection morbidity increases with any internal monitor = elevated BMI does not increase that risk**

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**Decision for IOL:**
accept risk of emergency C/S

**Place Foley catheter:**
consider as outpatient procedure x 12-18h
decrease time of admission, immobility

**Start Miso 50 mcg q2h**
Expectation: 24 – 36 hours for cx ripening phase (range 1-91h)

**Foley removed**
Expectation: Cx 3-4cm, no effaced

**Continue Miso 50 mcg q2h**

**AROM @ > 4cm, ideally with uterine contractions**
Expectation: average 12h (range 3-35h) to reach full dilatation

**@24h of Miso:**
no change in Cx dilation despite UC
no UC

**Switch to Oxytocin augmentation protocol**
Expectation: higher dose & duration and Maximum rate

**Apply FSE, IUPC**
Expectation: time to reach UC labor pattern
with adequate UC, Cx to dilate 1 cm q 2h
if FHR normal – expect 12+h of exposure to oxytocin *
? How to diagnose failed labor induction
? How to diagnose fail to progress in labor

- Lack of adequate cervical and uterine response to Miso and/or oxytocin
- Failure to progress despite uterine activity (Montevido units >200/10 min)

**Power** – responsiveness of myometrium

**Passenger** - increased rate of LGA, malposition, less comfort with operative vaginal birth
? Lower threshold for FHR changes

**Passage**: fat deposition obstructing descent

**Psyche**: immobility, frustration, nutrition, less supportive care (subconscious bias)

**Practitioner**: “weight stigma” influence

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**Consideration for Regional Anesthesia**

1. Anesthesia consult: International guidelines recommend for BMI >40
   @ 28w GA
   Work through fear, concerns,
   Access imaging
   Work up morbidities that may affect anesthesia considerations (esp OSA)

2. Recommend “Early” epidural placement: before active phase
   - risk of unplanned emergency C/S is elevated
   - risks associated with GA, challenge with intubation
   - difficult to position when experiencing pain
   - difficult to place in an emergent/urgent situation

   **Risk**: catheter slips with sweat, re-positioning
Consideration for TOLAC

| Previous C/S | 10 fold increased risk of failed IOL |
| BMI > 40 | Repeat C/S associated with lower rate of: uterine dehiscence / rupture endometritis composite maternal morbidity Apgar @5min <7 birth trauma (#, brachial plexus, lac) |

Recommend repeat ERCS

Consideration for VTE Prophylaxis and Antibiotics

Take Home Messages

- IOL at 39-39w6d lowest risk of morbidity greatest chance of vaginal birth
- BMI, Co-morbidities, Bishop Score, OBHx predict chance of successful vaginal birth
- Informed counselling: chance of success, risk of morbidity, expectations of C/S
- Expect longer duration of first stage of labor: latent phase 24-36h active phase 1cm per 2h
- Foley + PGE1 may be optimal mode of IOL
- Expect higher dose, duration & max rate of oxytocin, FSE & IUPC allows safe use
- Recommend early epidural
Labor Management for Patients with Obesity

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