**Oxytocin Induction/Augmentation Protocol**

**General Information**
1. Oxytocin is a polypeptide hormone produced in the hypothalamus and secreted from the posterior lobe of the pituitary gland in a pulsatile fashion.
2. Its synthetic analog is one of the most commonly used drugs and is used to stimulate labor in a fashion similar to spontaneous labor.
3. Individual patients vary in response to oxytocin, but pharmacokinetics is similar in that uterine response generally ensues after 3-5 minutes of infusion and reaches a plasma steady state by 40 minutes.
4. Both low does and high dose regimens exist and are appropriate for labor induction. To date, no conclusions have been drawn in regard to whether low dose or high dose is more efficacious for induction or augmentation in nulliparous or multiparous women.
   a. Low dose protocols have been associated with lower total dosage of Pitocin, less frequent uterine tachysystole and associated changes in fetal heart rate.
   b. High dose protocols have been associated with a shorter duration of labor, decreased cases of chorioamnionitis and cesarean delivery for dystocia. Although High dose protocols are associated with increased episodes of tachysystole and associated changes in fetal heart rate, there has consistently been no difference in fetal outcomes when low and high dose Pitocin are been compared.
5. Oxytocin can also be used for cervical ripening
   a. In women who present with PROM, oxytocin is associated with a decreased risk of chorioamnionitis and reduced risk of neonatal antibiotic use but was also associated with an increased risk of failure to deliver within 24 hours compared with vaginal prostaglandins.
   b. Oxytocin and misoprostol have been found to have similar rates of vaginal delivery when used for cervical ripening, without differences in maternal complications or neonatal outcomes noted.

**Contraindications**:  
1. Active genital Herpes Simplex infection  
2. Placenta or vasa previa  
3. Umbilical cord compromise/prolapase  
4. Fetal malpresentation (breech, transverse lie)  
5. Non-reassuring fetal status indicating need for urgent delivery  
6. Previous classical cesarean section, T-incision, or uterine surgery entering the uterine corpus

**Adverse Effects**:  
1. Tachysystole  
   a. >5 uterine contractions in 10 minutes averaged over a 30-minute period with or without fetal heard rate decelerations.
b. Treat by repositioning, administering a fluid bolus, decreasing/discontinuing oxytocin infusion rate, or administration of 0.25 mg terbutaline subcutaneously

2. Hyponatremia
   a. Oxytocin and vasopressin (antidiuretic hormone) share a similar structure and oxytocin can cross-react with the renal vasopressin receptor which can result in dilutional hyponatremia.\(^9,10\)
   b. Although uncommon, hyponatremia can occur with oxytocin administration in large doses (>20mU/min) in large quantities of hypotonic solutions (D5W) for prolonged periods which can result in severe, symptomatic hyponatremia
      i. Symptoms: headache, anorexia, nausea, vomiting, abdominal pain, lethargy, drowsiness, unconsciousness, seizure, irreversible neurologic injury.\(^9\)
   c. Treatment: discontinuation of oxytocin and any other hypotonic solutions with slow, careful correction of hyponatremia.

3. Hypotension
   a. Oxytocin relaxes vascular smooth muscle and rapid infusion can lead to hypotension and tachycardia

**Low dose Oxytocin Protocol**

1. Candidates
   a. Term or preterm pregnant patients with no contraindication to oxytocin use (see above)
   b. Reassuring fetal status
   c. Those not qualifying for high dose Oxytocin below
   d. Patients with \(<\) 2 prior low transverse cesarean sections (please see induction of labor protocol for more information)

2. Schedule
   a. Place 20 units in 1000 mL of normal saline to yield an oxytocin concentration or 20mU/mL.
   b. Start IV infusion at 1 mU/min and increase rate as follows:

<table>
<thead>
<tr>
<th>Time (Min)</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 mU/min</td>
</tr>
<tr>
<td>30</td>
<td>2 mU/min</td>
</tr>
<tr>
<td>60</td>
<td>4 mU/min</td>
</tr>
<tr>
<td>90</td>
<td>6 mU/min</td>
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<tr>
<td>120</td>
<td>8 mU/min</td>
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<tr>
<td>150</td>
<td>10 mU/min</td>
</tr>
<tr>
<td>180</td>
<td>12 mU/min</td>
</tr>
<tr>
<td>210</td>
<td>14 mU/min</td>
</tr>
<tr>
<td>240</td>
<td>16 mU/min</td>
</tr>
<tr>
<td>270</td>
<td>18 mU/min</td>
</tr>
<tr>
<td>300</td>
<td>20 mU/min</td>
</tr>
</tbody>
</table>
c. **Oxytocin is to be started on the half hour to facilitate uniformity in administration for all patients receiving oxytocin**
d. Oxytocin will be increased until a maximum dose of 20 mU/min is reached or adequate uterine contractions (5 contractions/10 minutes or >200 MVUs/10 min over a 30-minute period) are reached.
   i. Oxytocin is not to be increased if tachysystole is present
   ii. Oxytocin > 20 mU/min requires placement of IUPC for quantitative monitoring of uterine activity and chart documentation of physician rationale and MD consult for non-MD managed patient
e. Maximum dose is 20mU/min if attempting TOLAC.

**High Dose Pitocin Protocol**

1. **Candidates**
   a. Term (37w0d-41w0d) pregnant patients with no contraindication to oxytocin use (see above)
   b. Bishop score >6
   c. Reassuring fetal status in pregnancies not complicated by fetal congenital anomalies
   d. No history of uterine surgery or prior uterine rupture
   e. Absence of pre-eclampsia with severe features, diabetes requiring an insulin drip, heart disease, or severe anemia <7.5, grand multiparity (G5P4 or greater)
   f. Third trimester IUFD*

2. **Schedule**
   a. Place 20 units in 1000 mL of normal saline to yield an oxytocin concentration or 20mU/mL.
   b. Start IV infusion at 4 mU/min and increase rate as follows:

<table>
<thead>
<tr>
<th>Time (Min)</th>
<th>Dose</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>4 mU/min</td>
</tr>
<tr>
<td>30</td>
<td>8 mU/min</td>
</tr>
<tr>
<td>60</td>
<td>12 mU/min</td>
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<tr>
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<tr>
<td>150</td>
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<tr>
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<td>26 mU/min</td>
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<tr>
<td>240</td>
<td>28 mU/min</td>
</tr>
<tr>
<td>270</td>
<td>30 mU/min</td>
</tr>
</tbody>
</table>

   *IUFDs were excluded from all studies comparing high and low dose oxytocin. However, given the shorter induction time, high dose oxytocin is a reasonable choice for IOL in this patient population as long as no contraindications are present (no history of uterine surgery/uterine rupture, pre-eclampsia with severe features, diabetes requiring insulin drip, heart disease, severe anemia, or grandmultiparity).
Pitocin for Cervical Ripening

1. Candidates
   a. Term and preterm PPROM and PROM patients with no contraindications to oxytocin use (see above)
   b. Bishop score $\leq 5$
   c. Reassuring fetal status
   d. Patients with $\leq 2$ prior low transverse cesarean sections (please see induction of labor protocol for more information)

2. Schedule
   a. Place 20 units in 1000 mL of normal saline to yield an oxytocin concentration or 20mU/mL.
   b. Start IV infusion at 1 mU/min and increase rate as follows, until 3-5 contractions every 10 minutes is reached:

<table>
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<tr>
<th>Time (Min)</th>
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<tr>
<td>120</td>
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</table>

   c. If 8 mU/min is reached, oxytocin to remain to 8 until bishop score is $\geq 6$. 
References