Safety Action Series
Effective Use of Labor Induction to Support Intended Vaginal Birth
Speakers

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Disclosures

• Joyce Edmonds, PhD, MPH, RN has no real or perceived conflicts of interest to disclose.

• David Lagrew, MD, FACOG has no real or perceived conflicts of interest to disclose.
Objectives

- Discuss institutional techniques to help facilitate safe and successful labor inductions that support vaginal births
- Provide tips on how institutions can successfully educate providers and enhance skills to promote successful vaginal births after induction of labor
- Describe the role of inductions in reducing primary cesarean section rates
- List the key components of scheduling induction of labor
- Understand the choices, risks and benefits of cervical ripening techniques
- Define “failed induction” and when the diagnosis benefits the maternal and neonatal outcomes
Outline

• Background
• Who should we induce?
• Scheduling properly
• Techniques of cervical preparation and induction
• Failed induction
• Evaluating performance
Why lower first time cesareans?

- 90% of first time cesareans will go on to deliver by cesarean section on subsequent pregnancies
- >90% of first time vaginal deliveries will go on to delivery vaginally in subsequent pregnancies (at far lower risk)
RESPONSE

To Every Labor Challenge

- Have available an in-house maternity care provider or alternative coverage which guarantees timely and effective responses to labor problems.

- Uphold standardized induction scheduling to ensure proper selection and preparation of women undergoing induction.

- Utilize standardized evidence-based labor algorithms, policies, and techniques, which allow for prompt recognition and treatment of dystocia.

- Adopt policies that outline standard responses to abnormal fetal heart rate patterns and uterine activity.

- Make available special expertise and techniques to lessen the need for abdominal delivery, such as breech version, instrumented delivery, and twin delivery protocols.
Induction of Labor

• The stimulation of labor before the onset of spontaneous labor for the purpose of accomplishing vaginal delivery.
Induction

- Of the approximate 4 million annual deliveries in the US, nearly half of nulliparous women and more than one third of multiparous women have their labors induced, and more than half of all inductions require cervical ripening.

Contraindications

• Placenta or vasa previa
• Transverse fetal lie
• Prolapsed umbilical cord
• Prior classical uterine incision
• Active genital herpes infection
• Previous myomectomy entering the endometrial cavity
ACOG Medical Indications for induction of labor

- Preeclampsia-Hypertensive disorders
- Premature rupture of membranes
- Chorioamnionitis
- Suspected fetal jeopardy
- Maternal medical problems
- Fetal demise
- Logistic factors
- Postdate pregnancy
Induction versus expectant management—the Canadian Trial

- Randomized 3407 patients of 41 or more weeks
- Used E2 PG Gel where needed, testing with FMC, NST/AFI
- CSR rate lower (21.2% vs. 24.5%)
- Fetal distress rate lower (5.7% Vs 8.3%)
- No difference in infant outcome

CSR Elephants in the room

- Medical Legal: Have we changed?
- Payment Reform: When will it transition?
- Provider: Willingness to change?
- *Elective Induction of labor?*
Retrospective Studies

Risks and Expectant Management

• The risk of developing any hypertension in expectantly managed women was 4.1% after 37 weeks, 3.5% after 38 weeks, 3.2% after 39 weeks, and 2.6% after 40 weeks.

• Compared with eIOL, women with hypertensive disorders had significantly higher rates of cesarean delivery and maternal morbidities (intensive care unit admission or death, third- or fourth-degree lacerations, maternal infections, and bleeding complications) at each week of gestation and the composite neonatal morbidity at 38 and 39 weeks of gestation.

Who is right?

- Clearly, spontaneous labor with usually favorable cervical exams and favorable fetal positioning is going to have lower chances for cesarean section.
- However, because expectant management has risk of developing complications which can increase cesarean
- In settings where clinicians not following a strict protocols for induction probably would lead to higher cesarean rates
- More research is indicated
Quality Improvement Programs

• Institutions should have quality assurance programs and induction policies including safety tools such as checklists to ensure that inductions are performed only for acceptable indications, that patients are informed and staff are prepared.
Hallmarks of QI Projects to Improve Induction of Labor

- Standardization and simplification are the hallmarks of safe patient care processes.
- Standardized terminology, definitions, and clinical criteria.
- Widespread staff engagement with strong physician and nurse leadership.
- Robust, reliable, and convincing data collection and regular performance feedback.
- A review process and/or induction committee.
Scheduling Induction of Labor

Date: ____________________
Patient: ____________________
Date of birth: ____________
Physician or certified nurse-midwife: ____________________
Gravida/Parity: ____________________
Estimated date of delivery: ____________
Best estimated gestational age at delivery: ____________
Proposed induction date: ____________
Proposed admission time: ____________

- Gestational age of 39 0/7 weeks or older confirmed by either of the following criteria (1):
  - Ultrasound measurement at less than 20 weeks of gestation supports gestational age of 39 weeks or greater
  - Fetal heart tones have been documented as present for 30 weeks of gestation by Doppler ultrasonography

Indication for induction: (choose one)
- Medical complication or condition (1): Diagnosis: ____________________
- Nonmedically indicated (1–3): Circumstances: ____________________
Patient counseled about risks, benefits, and alternatives to induction of labor (1)
- Consent form signed as required by institution
Bishop Score (see below) (1): ____________

Bishop Scoring System

<table>
<thead>
<tr>
<th>Score</th>
<th>Factor</th>
<th>Dilation (cm)</th>
<th>Position of Cervix</th>
<th>Effacement (%)</th>
<th>Station*</th>
<th>Cervical Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Closed</td>
<td>Posterior</td>
<td>0–30</td>
<td>-3</td>
<td>Firm</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1–2</td>
<td>Midposition</td>
<td>40–50</td>
<td>-2</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3–4</td>
<td>Anterior</td>
<td>60–70</td>
<td>-1.0</td>
<td>Soft</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5–6</td>
<td>—</td>
<td>80</td>
<td>+1, +2</td>
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- Pertinent prenatal laboratory test results (eg, group B streptococci or hematocrit) available (4, 5)
- Special concerns (eg, allergies, medical problems, and special needs): ____________________

To be completed by reviewer:
- Approved induction after 39 0/7 weeks of gestation by aforementioned dating criteria
- Approved induction before 39 0/7 weeks of gestation (medical indication)
- HARD STOP – gestational age, indication, consent, or other issues prevent initiating induction without further information or consultation with department chair
Careful protocols for scheduling inductions

- Ensuring a safe gestational age;
- Clarifying that the patient has an appropriate indication;
- Making sure that appropriate cervical status and fetal positioning is present
- Validating the scheduling provider has documented appropriate patient counselling on the risk and benefits and techniques of the process
Patient Safety Checklist

Inpatient Induction of Labor

Date ___________ Patient ___________________________ Date of birth ___________ MR # ___________
Physician or certified nurse-midwife ___________________________ Last menstrual period ___________
Gravida/Parity ___________________________
Estimated date of delivery ___________ Best estimated gestational age at delivery ___________
Indication for induction ___________

Fetal Presentation (1)

- Vertex
- Other ___________
  - If other, physician or certified nurse-midwife notified

Estimated fetal weight ___________

- Patient has a completed medical history and physical examination

- Known allergies identified ___________

- Medical factors that could affect anesthetic choices identified ___________

- Pertinent prenatal laboratory test results (eg, group B streptococci or hematocrit) available (2, 3)

- Other special concerns identified (eg, medical problems and special needs): ___________

- Patient counseled about risks and benefits of induction of labor (1)

- Consent form signed as required by institution

Bishop Score (see below) (1):

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*Station reflects a -3 to +3 scale.

Inpatient preparations and support for induction of labor

- Contraindications sought and precautions taken
- Qualified person has done cervical exam
- Personnel trained in giving uterine-stimulating agents
- Because of increased chance of tachysystole, follow with high risk monitoring
- Physician privileged to do cesarean section
Nurse Staffing

- Inductions require higher rates of nurse staffing and more resources. The recommended patient to nurse ratio in cases of induction using synthetic oxytocin (Pitocin) administration is 1:1; the recommended patient to nurse ratio in cases of spontaneous labor is 2:1. (AWHONN, 2010)
Checklist-based Protocol for Oxytocin Administration

- Mean time of infusion to delivery was 8.5 +/- 5.3 hours versus 8.2 +/- 4.5 hours (NS).
- Newborn index of adverse outcome were significantly fewer in the post protocol group (31 vs 18, P = .049).
- System wide decline in the rate of primary cesarean delivery from 23.6% in 2005 to 21.0% in 2006.

### Table 2. Suggested Clinical Protocol for Oxytocin-Induced Uterine Tachysystole

#### Oxytocin-Induced Tachysystole (Reassuring [Normal] FHR)
- Maternal repositioning (left or right lateral)
- IV fluid bolus of approximately 500 mL of lactated Ringer’s solution
- If uterine activity has not returned to normal after 10 min, decrease oxytocin rate by at least half; if uterine activity has not returned to normal after 10 more min, discontinue oxytocin until uterine activity is less than 5 contractions in 10 min

#### Oxytocin-Induced Tachysystole (Nonreassuring [Indeterminate or Abnormal] FHR)
- Discontinue oxytocin
- Maternal repositioning (left or right lateral)
- IV fluid bolus of approximately 500 mL of lactated Ringer’s solution
- Consider oxygen at 10 L/min via nonrebreather facemask if the first interventions mentioned previously do not resolve the nonreassuring (indeterminate or abnormal) FHR pattern; discontinue as soon as possible
- If no response, consider 0.25 mg terbutaline subcutaneously
- Notify primary provider of actions taken and maternal-fetal response

#### Resumption of Oxytocin After Resolution of Hyperstimulation
- If oxytocin has been discontinued for less than 20-30 min, the FHR is reassuring, and contraction frequency, intensity, and duration are normal, resume oxytocin at no more than half the rate that caused the tachysystole and gradually increase the rate if needed as appropriate based on unit protocol and maternal–fetal status
- If oxytocin is discontinued for more than 30-40 min, resume oxytocin at the initial dose ordered

#### Physician/Certified Nurse Midwife Notification
- If uterine activity and/or the FHR pattern has not returned to normal after initiating the interventions, notify physician or midwife

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OXYTOCIN AS A HIGH-ALERT MEDICATION: IMPLICATIONS FOR PERINATAL PATIENT SAFETY.
Simpson, Kathleen; Rice PhD, RNC; Knox, G
MCN, American Journal of Maternal Child Nursing.
DOI: 10.1097/01.NMC.0000343859.62828.ee
Patient Counselling/Consent

SAFE REDUCTION OF PRIMARY CESAREAN BIRTHS: SUPPORTING INTENDED VAGINAL BIRTHS

Every Patient, Provider and Facility

- Build a provider and maternity unit culture that values, promotes, and supports spontaneous onset and progress of labor and vaginal birth and understands the risks for current and future pregnancies of cesarean birth without medical indication.

- Optimize patient and family engagement in education, informed consent, and shared decision making about normal healthy labor and birth throughout the maternity care cycle.

- Adopt provider education and training techniques that develop knowledge and skills on approaches which maximize the likelihood of vaginal birth, including assessment of labor, methods to promote labor progress, labor support, pain management (both pharmacologic and non-pharmacologic), and shared decision making.
Cervical Ripening

- Dissociation of the cervix
- Increase in glycosaminoglycans
- Increase in fibroblast activity
- Reduction of the stretch modulus
Cervical Ripening Agents

• Hormonal
  – Estradiol
  – Relaxin
  – Prostaglandin E2 (Prepadil, Cervidil)
  – Misoprostol

• Mechanical
  – Lamnicel/Laminaria
  – Stripping membranes
  – Balloon/Mechanical

• Extra-amniotic saline
Misoprostol vs. PG Insert

- 223 randomized patients
- Shorter median delivery interval with Misoprostol
- Delivery within 12 hours more common at 40.7% vs. 19.1%
- Hyperstimulation 21% of Misoprostol group vs. 7% of PG insert

• The catheter is threaded just inside the internal cervical os. The balloon rests on the internal os and puts pressure downward. The patients usually feel minimal cramping since the balloon elevates the amniotic sac and vertex.
High Dose vs. Low Dose Oxytocin

- The findings of our review do not provide evidence that high-dose oxytocin increases either vaginal delivery within 24 hours or the caesarean section rate.
- There is no significant decrease in induction to delivery time at meta-analysis but these results may be confounded by poor quality trials.
- High-dose oxytocin was shown to increase the rate of uterine hyperstimulation but the effects of this are not clear.
- More study indicated

## Variance in Oxytocin Protocols

<table>
<thead>
<tr>
<th></th>
<th><strong>High Dose</strong></th>
<th><strong>Low Dose</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Labor</strong></td>
<td>Dec by 3 hours</td>
<td></td>
<td>P&lt;0.0001</td>
</tr>
<tr>
<td><strong>Neonatal Sepsis</strong></td>
<td>0.2%</td>
<td>1.3%</td>
<td>P&lt;0.01</td>
</tr>
<tr>
<td><strong>CS-FTP</strong></td>
<td>9%</td>
<td>12%</td>
<td>P&lt;0.01</td>
</tr>
<tr>
<td><strong>CS-FD</strong></td>
<td>6%</td>
<td>3%</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td><strong>Hyper-stimulation</strong></td>
<td>55%</td>
<td>42%</td>
<td>NS</td>
</tr>
</tbody>
</table>

Satin et al, AJOG 166:1260, 1992
Critiquing a Failed Induction

- Induction in the face of unripe cervix (Bishop score < 8 primip and < 6 multip)
- Inadequate documentation of cervical ripening procedure and timing
- Adequate trial defined by latent phase at least 12-18 hours of oxytocin and ruptured membranes
Defining Failed Induction

- Nulliparous women remaining in the latent phase for 12 hours compared with women who had exited the latent phase had significantly increased rates of chorioamnionitis (12.1% compared with 4.1%) and endometritis (3.6% compared with 1.3%) and increased rates of neonatal intensive care unit admission (8.7% compared with 6.3%).

- Similar patterns were present for multiparous women at 15 hours.

- With ruptured membranes a latent phase (obtaining 6 cm) after initiation of oxytocin of at least 12 hours for nulliparous women and 15 hours in multiparous women is a reasonable criterion for diagnosing a failed induction.

Failed Induction-Exiting Latent Phase

Analysis of Induction Performance

Cesarean Delivery Checklist for Labor Dystocia or Failed Induction

Patient Name: ___________________________
MR#: ___________________________________
Obstetrician: ___________________________; Initial: ______
Bedside Nurse: ___________________________; Initial: _____

Indication for Primary Cesarean Delivery:

- [ ] Failed Induction (must have both criteria if cervix unfavorable, Bishop Score ≤ 8 for nullips and ≤ 6 for multips)
  - Cervical Ripening used for those starting with Bishop scores as noted above
  - Reason ripening used if cervix unfavorable: ___________________________
- [ ] Failed Induction: Duration in hours: _________________
- [ ] Latent Phase Arrest: Moderate or strong contractions palpated for ≥ 12 hours
  - Ripening agent used: ______________
- [ ] Unable to generate regular contractions (every 3 minutes) and cervical change after oxytocin administered for at least 12-18 hours after membrane rupture.  
  - Note: at least 24 hours of oxytocin administration after membrane rupture is preferable if maternal and fetal statuses permit
- [ ] Active Phase Arrest: Duration in hours: _________________
- [ ] Labor Dystocia in the Second Stage (must fulfill any one of four criteria)
  - Nullipara with epidural in the second stage > 4 hours inclusive of laboring down (if applicable)
  - Nullipara without epidural in the second stage > 3 hours inclusive of laboring down (if applicable)
  - Multipara with epidural in the second stage > 3 hours inclusive of laboring down (if applicable)
  - Multipara without epidural in the second stage > 2 hours inclusive of laboring down (if applicable)
- [ ] Although not fulfilling contemporary criteria for labor dystocia, my clinical judgment deem this cesarean delivery indicated
- [ ] Failed Induction: Duration in hours: _________________
- [ ] Latent-Phase Arrest: Duration in hours: _________________
- [ ] Active-Phase Arrest: Duration in hours: _________________
- [ ] Second-Stage Arrest: Duration in hours: _________________

Comments: ____________________________________________________________________________

Response

Safe Health Care for Every Woman

Slide 36
The CMQCC* toolkit is...

The product of multi-disciplinary collaboration and is aligned with key ACOG documents:

Available at [www.cmqcc.org](http://www.cmqcc.org)
Q&A Session
Press *1 to ask a question

You will enter the question queue
Your line will be unmuted by the operator for your turn

A recording of this presentation will be made available on our website:
www.safehealthcareforeverywoman.org
Next Safety Action Series

Update to the Severe Maternal Morbidity Review Forms

September 2016

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