

Helping Mothers and Babies Survive
Threatened Preterm Birth Care
Facilitator Flip Chart



Helping Babies Survive



Helping Mothers Survive

Helping Mothers and Babies Survive
Threatened Preterm Birth Care

Explain

Begin with a story:

"Imagine a mother who arrives at 32 weeks with a severe headache and BP 150/115. She has severe pre-eclampsia. You give her MgSO₄ and she delivers 36 hours later. The mother survives but her baby dies from complications of respiratory distress soon after birth."

Pause, and then say:

"Now imagine the same woman arrives, but you have access to dexamethasone, an antenatal corticosteroid, and recognize that severe pre-eclampsia is a condition that can lead to preterm birth."

After giving the mother MgSO₄, you also give her dexamethasone to help the baby's lungs mature. You note when each medication is due again, alert newborn care providers, and prepare for care of a preterm baby. The mother receives a 2nd dose of dexamethasone before giving birth and her baby receives immediate care for a small baby. Her baby does not develop respiratory distress and survives.

Maternal care providers can help reduce complications from prematurity by:

- Anticipating preterm birth (PTB)
- Providing treatment to the mother to help the baby

Invite Discussion

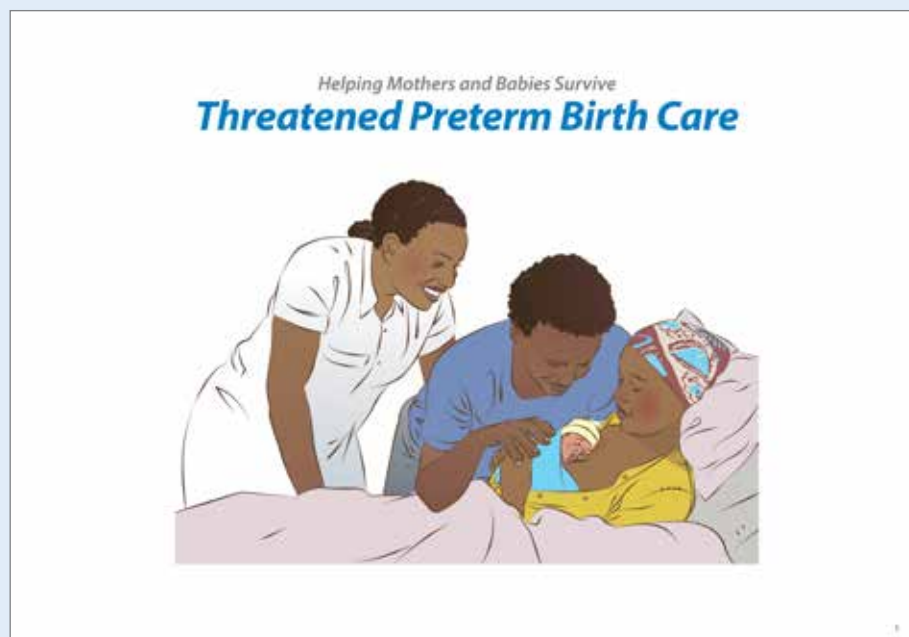
What do you do when you think someone is going to deliver a preterm baby?

Facilitate Practice

Show the Action Plan and learner materials.

Describe the time scale and the color coding.

Describe the actions that each picture represents.



Background

The Threatened PTB Care module gives providers the knowledge and skills to identify and provide care to mothers at high risk of delivering prematurely. This program is based on recommendations from global guidelines. The recommendations of local health authorities or ministries may vary slightly from the recommendations in this program. You should be familiar with these differences, and highlight them for the learner.

This module begins with estimating gestational age and diagnosing the most common maternal conditions leading to preterm birth (PTB). It then outlines care prior to the birth that can help the preterm baby survive. It assumes that detailed management of the maternal conditions, prevention and management of PTB, and management of the preterm newborn are taught using other programs; the Helping Mothers Survive and Helping Babies Survive programs are recommended.

Educational Advice

Begin with a story to encourage learners to think about how maternal care impacts preterm survival. Invite participants to share their experiences.

Introduce and explain the use of the Action Plan and Flip Chart. Each step in the Action Plan is presented on the Facilitator Flip Chart. The front is viewed by the learner. The back is viewed by the facilitator. It is organized into three steps to help the facilitator support learning:

1. Explain
2. Invite discussion
3. Demonstrate and facilitate practice

Start each new page by pointing to the matching icon on the Action Plan.

Facilitators should EXPLAIN the key points for understanding and **DEMONSTRATE** skills correctly. **INVITE DISCUSSION** to identify barriers and find solutions for incorporating knowledge and skills into practice. The discussion can also highlight important local practices. **FACILITATE PRACTICE** by providing materials for practice of the skill individually, in pairs, or in groups. Organize learners into groups of four–six as needed. Give clear instructions for activities, including allotted times.

Helping Mothers and Babies Survive
Threatened Preterm Birth Care



Always use a

Perinatal team approach

Explain

A perinatal team includes those involved in care of the mother or baby before or after birth:

- Antepartum, intrapartum, and postpartum maternal care providers
- Newborn care providers
- Facility administrators and pharmacy personnel

A perinatal team can include providers from different locations:

- The community
- The health center
- Different units within a hospital

Establishing a perinatal team enables providers to better communicate and work together to:

- Track outcomes and make quality improvement plans

- Prepare for and manage preterm birth
- Care for the preterm newborn and mother as a pair
- Understand the impact of the care they provide

A perinatal team approach includes:

- **Communication** of patient information between providers and collaboration in care decisions
- **Standard treatment protocols** that are understood, agreed upon, and followed
- **Team training**, such as practicing simulations together
- **Regular meetings** of the perinatal team to review progress and share individual patient outcomes, review findings from a **perinatal audit** system, and **plan for quality improvement**

Invite Discussion

What would a perinatal team approach look like in your setting?

1. Who can be added to the team?
2. How can you maintain regular communication? What will you discuss?
3. How can you share patient information between staff in different facilities or units?

Always use a
Perinatal team approach



To improve outcomes for mothers and babies

Background

Documentation, communication, and follow-up are key components of quality care. Often antenatal, intrapartum, and postpartum providers have limited communication. A perinatal team can develop procedures and policies to improve communication across providers and facilities to:

- Identify women at increased probability of preterm birth and alert providers to prepare for care of a preterm baby
- Share information that will inform and improve care of the mother or baby
- Understand the impact of their own care decisions by learning of patient outcomes
- Improve care of the mother and baby as a unit, thus enabling feeding, thermoregulation, and bonding

Educational Advice

This activity is primarily intended for hospitals where different types of providers may end up caring for the same patient. If participants work together, ask them to make action plans for developing a perinatal team approach.

When possible, begin forming the perinatal team and implementing a perinatal team approach prior to this training. If a perinatal team already exists, use this time to review how it is functioning and how it might be improved.

Always use a
Perinatal team approach



To improve outcomes for mothers and babies

Assess system readiness and prepare

Explain

There are four eligibility criteria for facilities to offer the full package of threatened PTB care.

This package should only be used in hospitals where trained staff and supplies are available to:

1. Accurately estimate GA
2. Accurately diagnose conditions leading to PTB
3. Provide advanced care for preterm newborns, including resuscitation, thermal care, feeding support, infection treatment, and safe oxygen use
4. Reliably identify and treat maternal infections

If criteria are not met:

- Focus on improving referral and transport to facilities that can offer threatened PTB care

If all four criteria are met, before introducing threatened preterm birth care at your facility, assess:

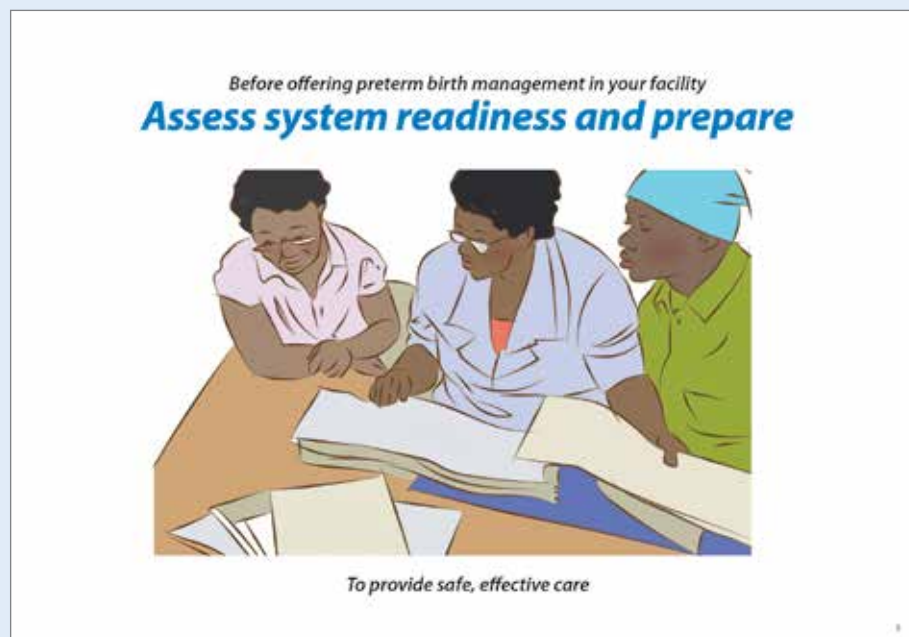
- The need for PTB services
- Clinical training needs of staff
- Communication between staff
- Perinatal team approach
- Availability of drugs and supplies
- Referral system and feedback loops
- Documentation, data collection and use

Use the information to make a plan.

Decide what changes need to be made for the system to be ready to provide PTB care with quality.

Invite Discussion

1. Has anyone ever helped plan for the introduction of a new intervention before? What did you find helpful or wish you had done differently?
2. Who will be responsible in your facility for assessing system readiness and forming a plan for any needed changes? How will you participate in this process?



Background

Careful assessment and preparation prior to offering threatened PTB care is the first step in ensuring quality of care. The first step is to evaluate whether your facility meets the four eligibility criteria. These were developed based on outcomes from the ACT trial (Althabe et al. 2014), which evaluated implementation of dexamethasone at different levels of the health care system in six developing countries. The study found increased stillbirth and neonatal mortality in infants born larger than the 25th percentile for weight whose mothers had received dexamethasone. Women in the intervention arm of the trial also had higher rates of presumed sepsis than those in the control arm.

While the full package of interventions covered in this module should only be implemented at higher-level facilities able to meet these criteria, antibiotics for preterm prelabor rupture of membranes (PPROM) should be implemented at any level of care where providers are able to diagnose PPRM and administer antibiotics.

Once the four essential criteria have been met, further assessment and preparation will help ensure systems are in place and ready to provide safe, effective, consistent quality care.

- To be able to plan adequately, you first need to estimate the need for the services: How many preterm births do you expect in a month?
- Next, who will be involved in delivering those services? Do they need additional training in documentation, assessment, diagnosis, or treatment?
- Is there a working perinatal team with clear communication pathways between maternal and neonatal care providers?
- How will you ensure the needed supplies and commodities are available when and where they are needed?
- Does outreach need to be done to increase referral of threatened preterm birth from lower levels of the health care system? How will you communicate outcomes and feedback back to those initiating referrals?
- Finally, how will you know if you are succeeding and how to improve?

Educational Advice

When possible, carry out a facility assessment and form an action plan with the facility perinatal or quality improvement team prior to this clinical training. If this has been done, use this time to discuss the findings, action plan, what has been accomplished, and next steps.

Before offering preterm birth management in your facility

Assess system readiness and prepare



To provide safe, effective care

Assess woman's condition (quick check)

Explain

Using the “quick check” method, assess all women within 15 minutes of arrival.

Ask, Check, Record

- Why did you come?
- When do you think you should be having your baby?
- Fetal movement?
- Bleeding, leaking, headache, pain or fever?

Look, Listen, Feel

Classify emergency for the woman if she is:

- Unconscious
- Bleeding vaginally
- Convulsing
- Vomiting severely

Or if she has:

- Severe abdominal pain or looks very ill
- Headache, visual disturbances, or a diastolic blood pressure > 110
- Severe difficulty breathing
- Fever

Stabilize if necessary and continue to manage maternal condition.

Check for fetal heart tones.

If fetal heart tones absent, deliver.

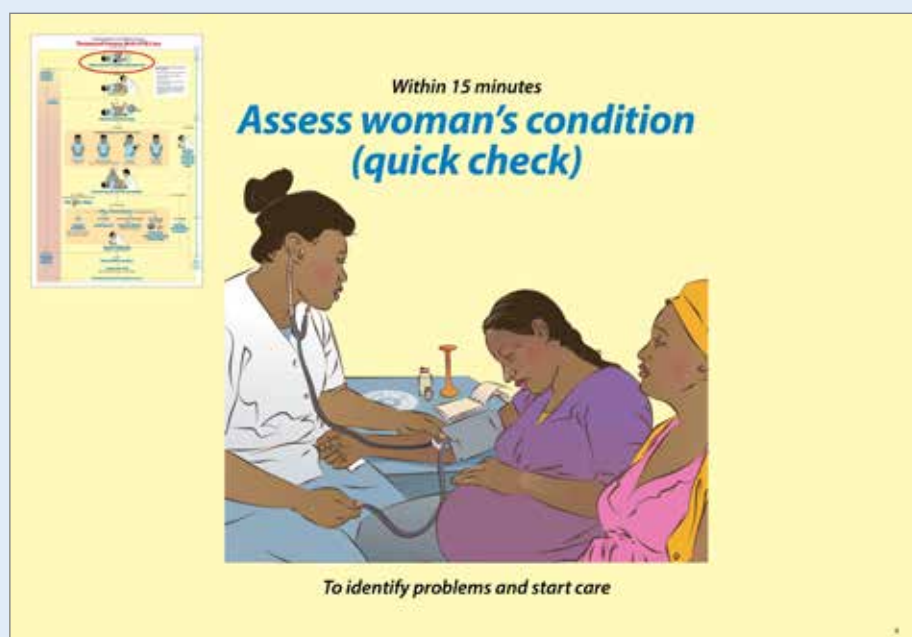
Invite Discussion

1. How is your current assessment method with incoming patients the same or different from a quick check?
2. Are all women assessed within 15 minutes of arrival? If not, what could be changed to make that possible?

Demonstrate and Facilitate Practice

Role-play a quick check:

Ask a co-facilitator or volunteer to play the role of the mother. Ask her the four “ask, check, record” questions and record her answers. Take her temperature and BP. Tell the group the clinical signs you are seeing from the “look, listen, feel” questions. For example: “She is conscious and not convulsing or severely vomiting, but looks very ill ...”



Background

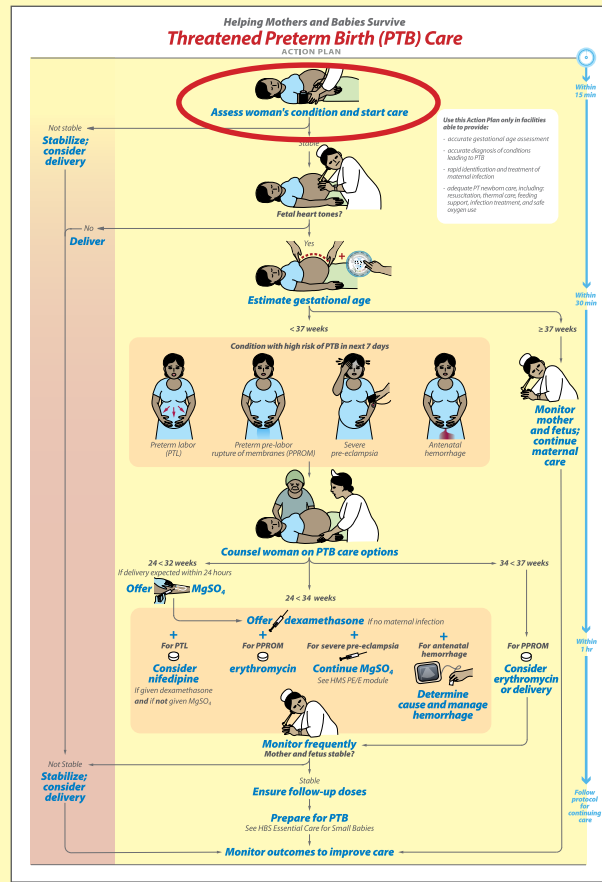
For initial maternal assessment, a quick check is recommended. This method was developed to help quickly identify life-threatening conditions. When combined with gestational age estimation, it will also help to identify women at risk of immediate preterm birth—those with:

- Painful contractions
- Fluid leaking
- Severe pre-eclampsia
- Vaginal bleeding

More detailed information on performing a quick check can be found in the WHO et al. 2015 publication *Pregnancy, Childbirth, Postpartum and Newborn Care: A Guide for Essential Practice*.

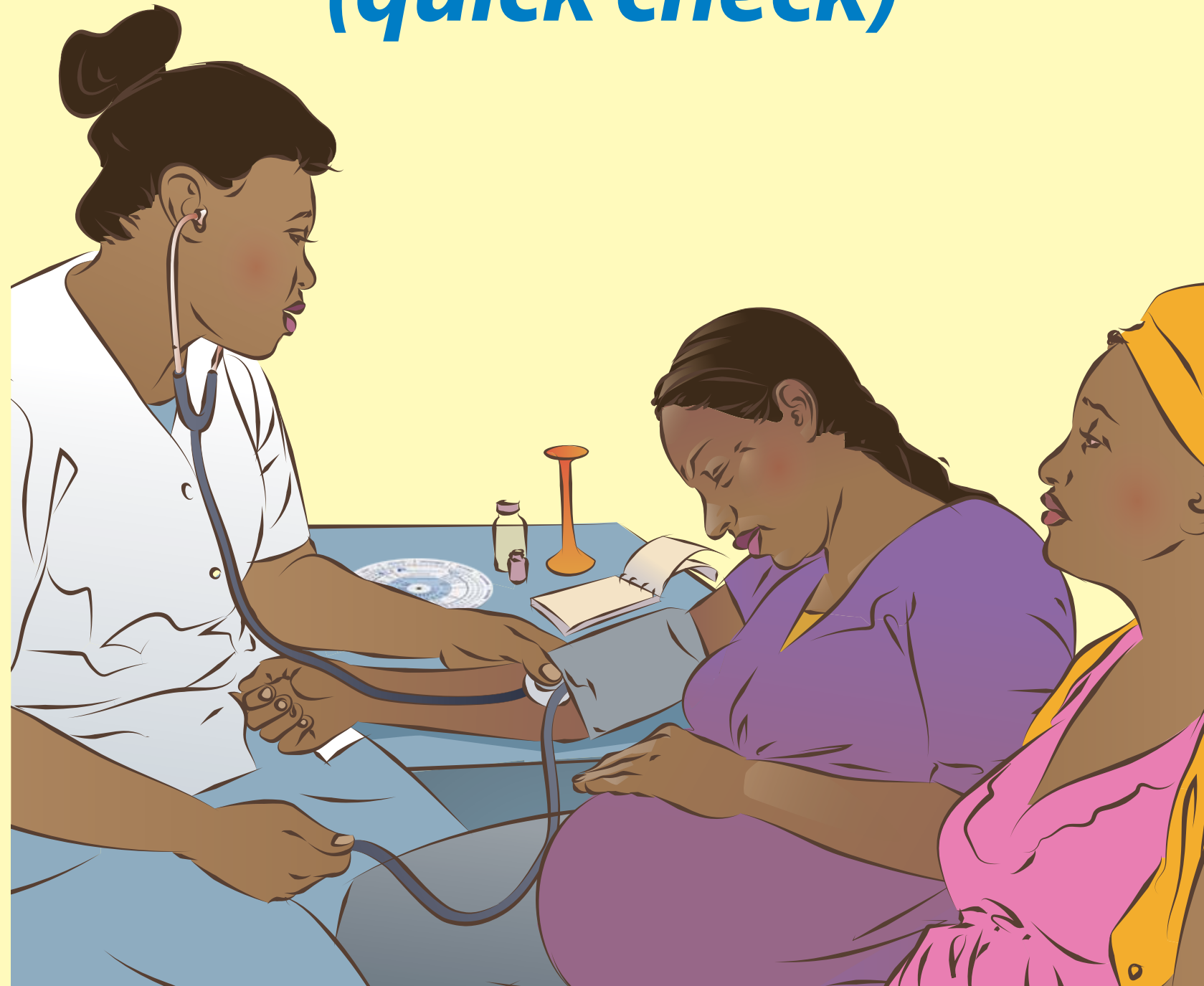
Educational Advice

If time allows, ask participants to practice role-playing a quick check in pairs.



Within 15 minutes

Assess woman's condition (quick check)



To identify problems and start care

Estimate gestational age (GA)

Explain

Gestational age (GA) guides care decisions. Dexamethasone can increase perinatal mortality if given at the wrong GA.

Always use more than one method to determine gestational age:

- Review antenatal records and question the woman about her LMP (first day of her last menstrual period)
- Measure fundal height
- Review or perform ultrasound if necessary and available

Have high confidence in GA estimation when:

- There are results from a first-trimester ultrasound
- The mother is sure of her exact LMP
- More than one method was used to calculate GA and they agree within 3 weeks

Have low confidence in GA estimation when:

- Only one method was used to estimate GA (unless it is a first-trimester ultrasound or sure LMP)
- Two methods differ > 3 weeks

Review the GA Job Aid.

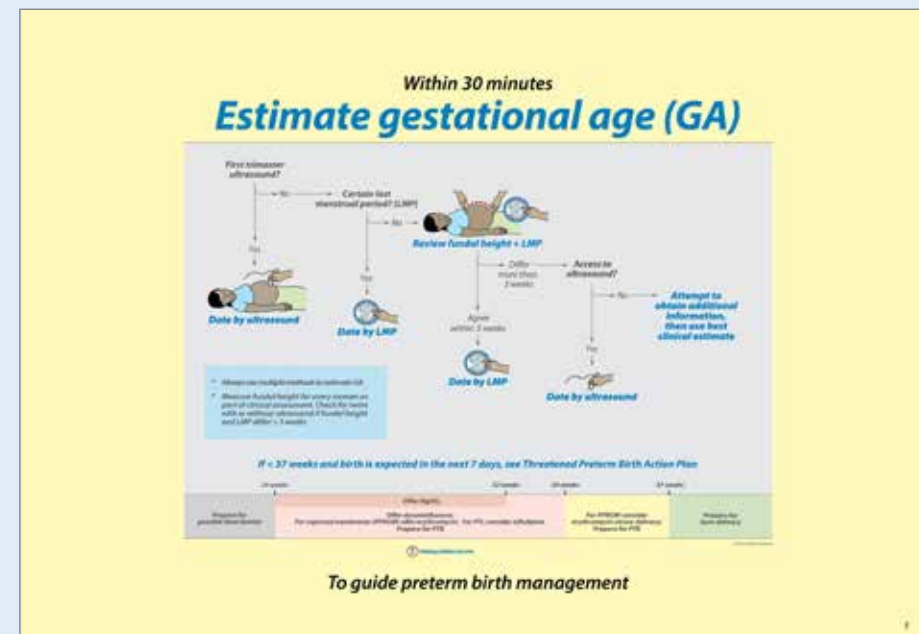
Perform role-play (optional) to demonstrate interviewing techniques to establish LMP, use of a GA wheel, proper measurement of fundal height, and use of the GA algorithm (suggested script pg 25b).

Invite Discussion

1. How do you currently estimate GA? What challenges do you have?
2. What can you change in your facility to make sure gestational age is estimated and recorded for every patient?

Demonstrate and Facilitate Practice

1. **Review fundal height measurement:**
Demonstrate proper technique using an anatomical model/simulator or live model.
2. **Review use of gestational wheel and the calendar method to calculate LMP.**
Have learners practice using the GA wheel in pairs if they are unfamiliar with it.



Background

Historically, having an accurate GA did not greatly impact antenatal care. However, when PTB management is available, having an accurate GA allows providers to both start care before birth and prepare to care for a small baby after birth. There is evidence from the ACT trial (Althabe et al. 2014) that dexamethasone may increase perinatal mortality when given to women > 34 weeks GA.

Most methods for estimating GA are only accurate +/- 2 weeks. Because of the potential for harm, always use more than one method to achieve the best estimate.

Educational Advice

Make GA wheels available for practice. These may be new to many participants. Take time to review how to use them and check for understanding by calculating a few GAs together. If providers are using smartphones, share and discuss pregnancy calculator apps.

Calculating gestational age by fundal height: Usually a ratio of 1 week per cm after 20 weeks gestation is used (for example, if a woman measures 26 cm, the GA

estimation would be 26 weeks). However, in some countries it is common to use a different ratio. (For example, in Malawi, providers often multiply the fundal height by eight and then divide by seven to estimate GA.) Discuss with participants how they calculate GA from fundal height. Find out if there is a national protocol prior to training and review any differences with participants.

The **calendar method** uses the following formula to calculate the estimated delivery date (EDD):

(First day of LMP + 7 days) – (3 months) or
(First day of LMP + 7 days) + (9 months)

To calculate GA, you need to know the number of weeks between the EDD and today's date: **GA = 40 – (# of weeks between today's date and the EDD).**

Example: LMP = May 9. Today's date = January 12.

(May 9 + 7 days) – (3 months) = February 16

(May 9 + 7 days) + (9 months) = February 16

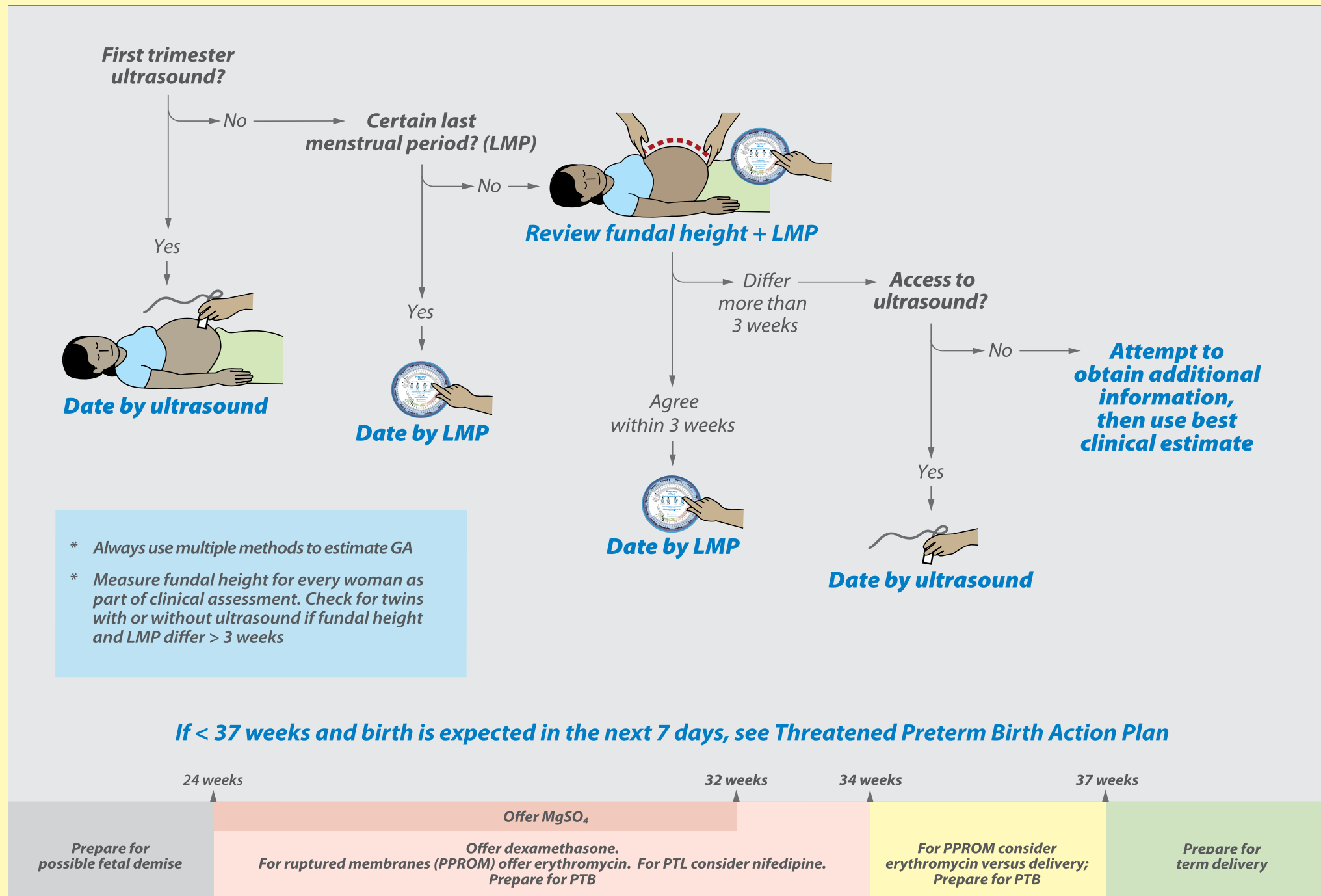
EDD = February 16

There are 5 weeks between January 12 and February 16.

GA = 40 – 5 = 35 weeks

Within 30 minutes

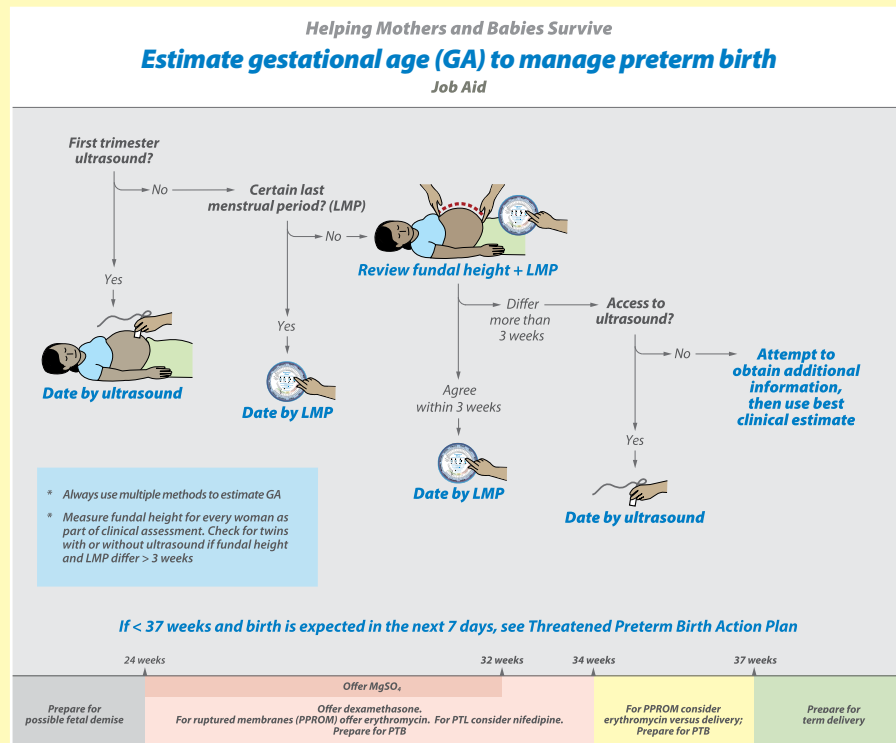
Estimate gestational age (GA)



To guide preterm birth management

Exercise: Estimating gestational age

Today is: April 15



Have learners work in pairs to complete each case using the GA Job Aid as a guide. Tell them they will have 20 minutes to work. The cases are available on pg 17 of the Provider Guide. Review answers as a large group, asking participants to share their work. Answers are based on using the GA Job Aid.

Note: Calculate GA from the first day of the last menstrual period (LMP). For these case studies, it is assumed that fundal height in cm = GA in weeks. Also, dates may differ by 1–2 days depending on whether a wheel or the calendar method is used to estimate EDD and GA.

CASE STUDY 1

Use April 15 as today's date

A woman arrives with ruptured membranes. She is not contracting. She is absolutely certain her LMP was on September 28, her birthday.

1. What is her expected due date and GA based on LMP?
July 5; 28 weeks, 2 days
2. If available, would you request an ultrasound for GA estimation?
No; LMP is certain
3. What is your estimation for her GA today?
28 weeks, 2 days
4. Do you have high or low confidence in this GA estimation?

CASE STUDY 2

Use April 15 as today's date

You've just diagnosed a woman with severe pre-eclampsia. She can remember that her last menstrual period finished just before Independence Day, which is August 15. Using August 8 as her LMP:

1. What is her expected due date and GA by LMP?
May 16; 35 weeks, 4 days

Her fundal height measures 38 cm.

2. If available, would you request an ultrasound for GA estimation?
No; fundal height and LMP < 3 week difference
3. What is your estimation for her GA today?
35 weeks, 4 days
4. Do you have high or low confidence in this GA estimation?

CASE STUDY 3

Use April 15 as today's date

Your patient is having painful contractions every 3 minutes and her cervix is 3 cm dilated. She thinks that her LMP was in the beginning of November, around the time the rains started. Using November 1 as her LMP:

1. What is her expected due date and GA by LMP?
August 8; 23 weeks, 3 days]

Her fundal height measures 30 cm.

2. If available, would you request an ultrasound for GA estimation?
Yes; LMP and fundal height differ > 3 weeks

An US estimates the fetus as 27 weeks.

3. What is your estimation for her gestational age today?
27 weeks
4. Do you have high or low confidence in this GA estimation?

CASE STUDY 4

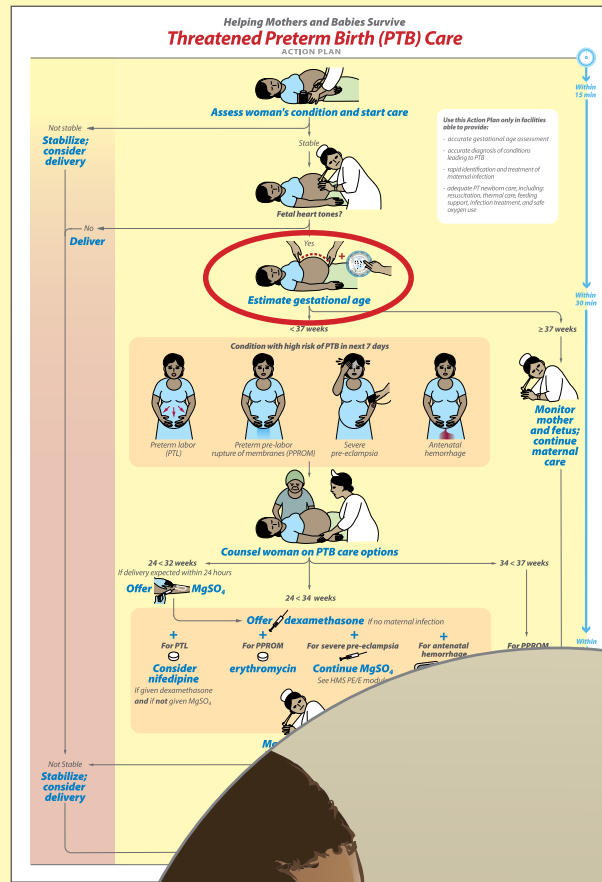
Use April 15 as today's date

A woman has been seeing blood on her underwear for the last 3 days. Today there is more. She thinks her LMP was around the middle of July. Using July 15 as her LMP:

1. What is her expected due date and GA by LMP?
April 22; 39 weeks

Her fundal height measures 34 cm.

2. If available, would you request an ultrasound for GA estimation?
Yes; LMP and fundal ht. differ > 3 weeks
3. There is no access to an US, what would you do next?
Attempt to obtain additional information: details around LMP; date the baby first moved; perform Leopold maneuvers to estimate fetal size
4. Do you have high or low confidence in the GA estimation?



Exercise

Estimating gestational age



Review LMP



Fundal height



Ultrasound

Determine if at risk of preterm birth (PTB)

Explain

There are four primary conditions that increase the risk of birth within 7 days:

1. Labor
2. Pre-labor rupture of membranes
3. Severe pre-eclampsia (SPE)
4. Antepartum hemorrhage

If a woman with any of these conditions is < 37 weeks GA, she is at risk of having a preterm birth.

Maternal care providers can take actions to help preterm babies survive:

- Magnesium sulfate (MgSO₄) for neuroprotection
- Dexamethasone for lung maturity
- Nifedipine for preterm labor to give dexamethasone time to be effective
- Erythromycin for PPROM to prevent infection and delay labor

- Alerting newborn care providers and preparing to care for a preterm newborn

These actions should only be taken when a woman is at immediate increased risk of preterm birth in the next 7 days.

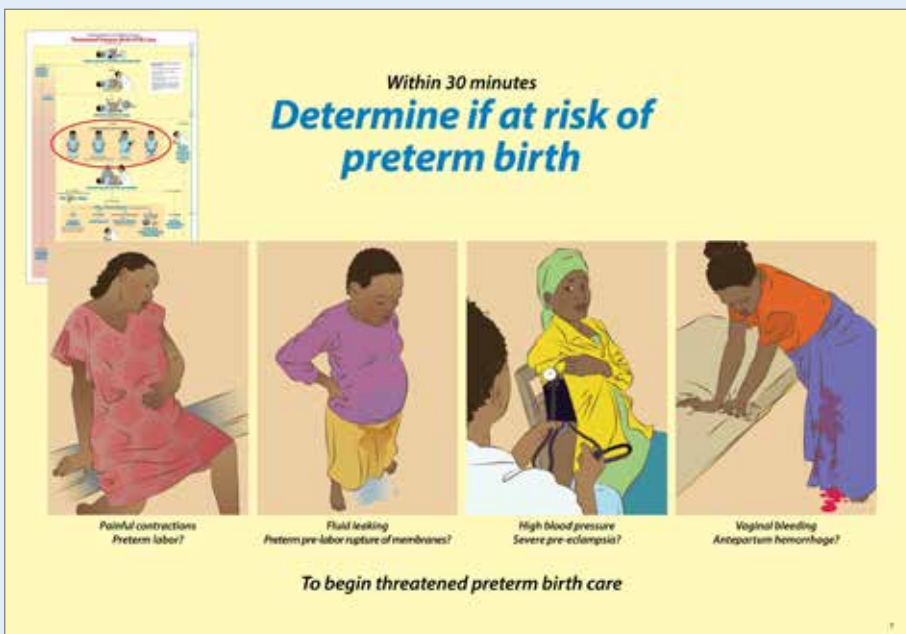
Do not use for overall increased risk of PTB such as multiple gestation or prior history.

Do not delay delivery to provide threatened PTB care if immediate delivery is needed for the safety of the mother or fetus:

- Worsening pre-eclampsia/eclampsia
- Maternal hemorrhage
- Intra-amniotic infection (chorioamnionitis)
- Nonreassuring fetal status

Invite Discussion

1. How do women find out about the danger signs of these four conditions? How could awareness be raised?
2. Does your facility have protocols to diagnose and manage these conditions? Is preterm birth management included in the protocols?



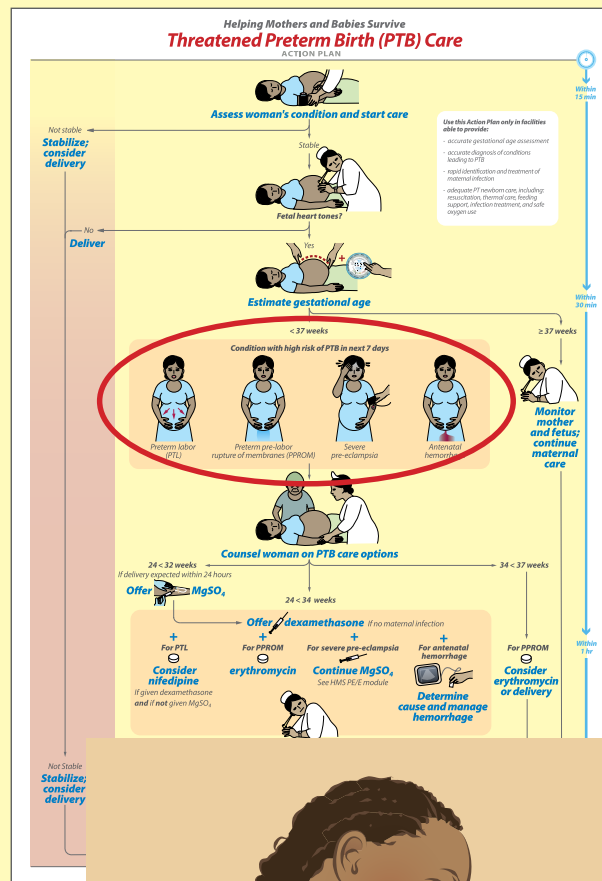
Background

These are the four most common conditions leading to preterm birth within 7 days. There are others. PTB management can be initiated anytime there is an immediate increased risk of preterm birth. It should not be started for someone with an overall higher risk of preterm birth, such as multiple gestation or a history of preterm birth, unless she also has a condition making it likely she will deliver in 7 days.

For additional information on management of these conditions, see *Managing Complications in Pregnancy and Childbirth: A Guide for Midwives and Doctors* (WHO and Department of Reproductive Health and Research 2007).

Educational Advice

Prior to the training, review the diagnostic criteria found in the Provider Guide on pages 20–21. Note any differences with current practice in your facility.



Within 30 minutes

Determine if at risk of preterm birth



**Painful contractions
Preterm labor?**



**Fluid leaking
Preterm pre-labor rupture of membranes?**



**High blood pressure
Severe pre-eclampsia?**



**Vaginal bleeding
Antepartum hemorrhage?**

To begin threatened preterm birth care

Exercise: Recognize four conditions that lead to preterm birth

Small Group Work

Divide participants into four groups. Assign each group one of the four conditions. Ask them to review the condition in the Provider Guide on pgs. 20–21, discuss any additions or changes they would make to the information, and prepare a presentation for the rest of the group. Tell them they will have 10 minutes to prepare and 5 minutes to present.

During the presentations, take time to discuss any changes the groups suggest and any areas of disagreement. Acknowledge that we don't always have perfect information with which to make a diagnosis.

Preterm Labor



Definition: Regular contractions of the uterus resulting in cervical changes before 37 weeks' pregnancy

Symptoms

- Painful contractions
- Cramping, pelvic pressure, low backache
- Vaginal discharge

Signs

- A change in cervical dilation or effacement
- ≥ 3 contractions in 10 min. plus at least one of the following:
 - PPROM
 - Cervical dilation > 2 cm
 - Effacement > 2 cm (50%)

Preterm Prelabor Rupture of Membranes (PPROM)



Definition: When the bag of water breaks after viability and before 37 weeks' gestation without labor

Symptoms

- Sudden gush of fluid and/or continued leaking

Signs

- Pooling of fluid (liquor) in the posterior fornix seen using a sterile or high-level disinfected (HLD) speculum
- Typical odor of amniotic fluid

Severe Pre-Eclampsia/Eclampsia



Definition: Pre-eclampsia (defined as BP $> 140/90$ with proteinuria after 20 weeks' pregnancy) that worsens or involves other organ systems. Eclampsia is the onset of seizures in someone with pre-eclampsia. If BP $> 160/110$ and unable to assess proteinuria, assume pre-eclampsia.

Symptoms

- Severe headache
- Visual disturbances

- Right upper quadrant pain/epigastric pain
- Shortness of breath

Signs

- BP $> 160/110$
- Proteinuria
- Pulmonary edema
- Oliguria (passing < 400 mL urine in 24 hrs)
- Thrombocytopenia (platelet count less than 100,000/microliter)
- Elevated liver enzymes

Antepartum Hemorrhage



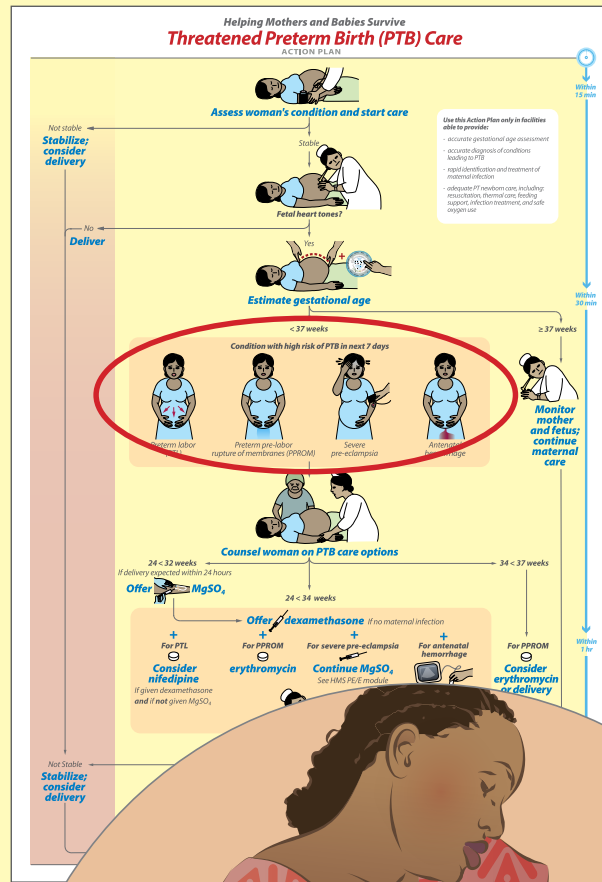
Definition: Vaginal bleeding after viability prior to the birth of the baby. Bleeding can be due to placenta previa, abruptio placentae, ruptured uterus, violence, or abuse

Symptoms

- Vaginal bleeding
- intermittent or constant abdominal pain (placental abruption or ruptured uterus)
- Recurrent painless bleeding; bleeding caused by intercourse (placenta previa)
- History of recent trauma

Signs

- Vaginal bleeding
- Shock: fast, weak pulse (> 110 BPM); low blood pressure (systolic < 90 mmHg)



Exercise:

Recognize four conditions that lead to preterm birth



**Painful contractions
Preterm labor?**



**Fluid leaking
Preterm prelabor
rupture of membranes?**



**High blood pressure
Severe pre-eclampsia?**



**Vaginal bleeding
Antepartum hemorrhage?**

Counsel the woman and her support people

Explain

Patients have the right to make informed decisions about their care.

This means they must understand the risks and benefits of interventions, be given the opportunity to ask questions, and be allowed to refuse care.

Counseling improves both outcomes and patient satisfaction:

- It helps patients take part in their own care for better outcomes
- It leads to more trust in the health care system

Counsel every patient along with her support people before beginning care.

Ask the woman who is able to make decisions and include them in the counseling.

Counseling checklist:

1. Explain options, including doing nothing
2. For each option, explain benefits, risks and uncertainties
3. Check that the patient understands what you have said; ask if she has any questions
4. State your recommendation and explain what you will do (for example, how and when dexamethasone will be given)
5. Ask permission to start care

Invite Discussion

1. How is this similar to or different from what you do now?
2. What do you think about asking patients for their permission before starting care?

Explore current practice, barriers to obtaining informed consent, fears, and benefits of counseling (patient education, can help providers with care).

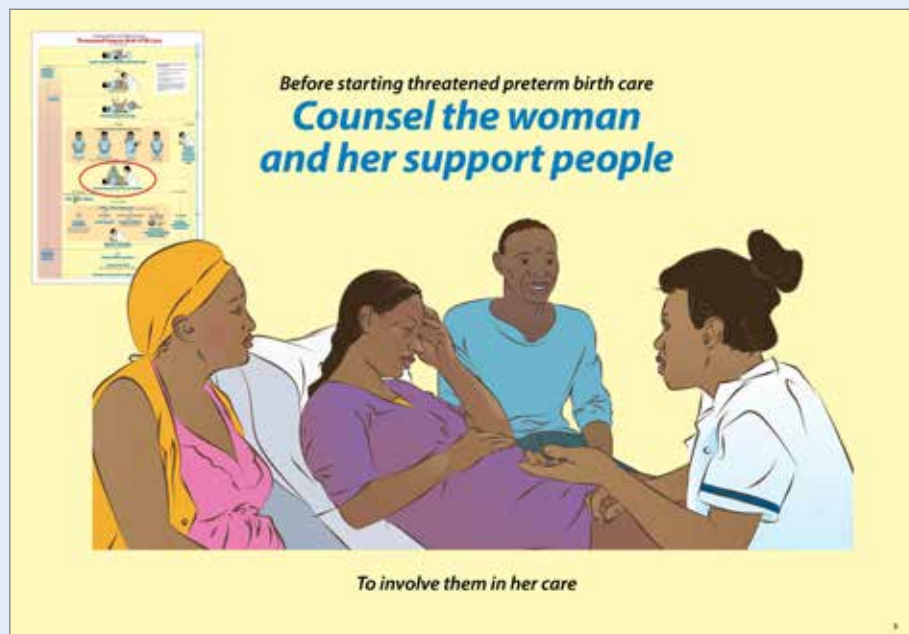
Demonstrate and Facilitate Practice

Demonstrate

Ask a co-facilitator or participant volunteer to play the role of a patient who is 32 weeks GA with ruptured membranes.

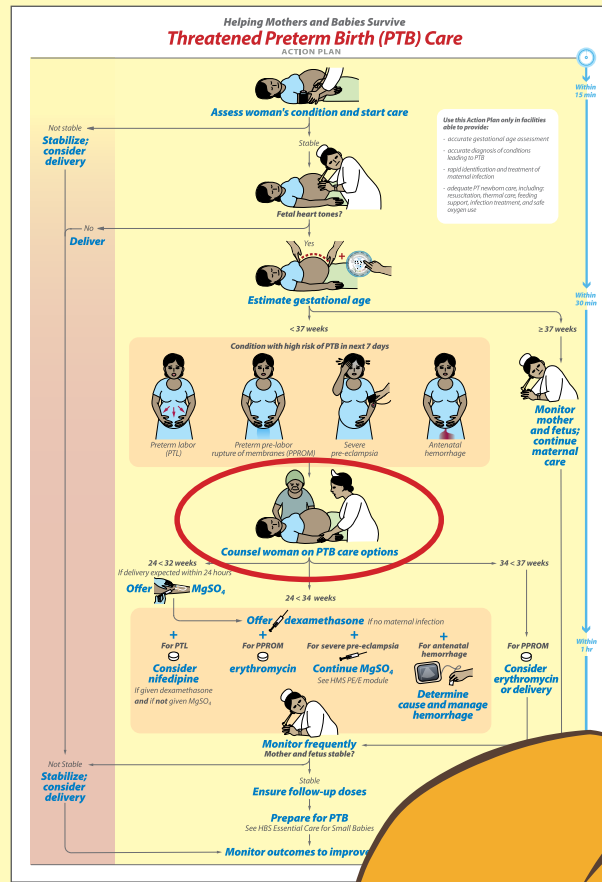
Offer the patient MgSO₄, dexamethasone, and erythromycin one at a time using the counseling checklist.

Explain participants will practice counseling after the interventions are reviewed.



Educational Advice

For the demonstration, write the counseling checklist on a flip chart or whiteboard and ask participants to follow along and make sure you complete all the steps. Always model good counseling techniques: don't try to "test" participants by purposefully omitting steps.



Before starting threatened preterm birth care

Counsel the woman and her support people



To involve them in her care

If < 34 weeks and at risk of birth in the next 7 days, immediately

Offer dexamethasone

Explain

Dexamethasone is an antenatal corticosteroid (ACS). ACS can reduce death in preterm babies by > 30%:

- Primarily by speeding maturity of the fetal lungs
- Also by protecting the intestines and blood vessels in the brain

Dexamethasone may increase the risk of:

- Maternal sepsis
- Neonatal mortality in infants born \geq 37 weeks GA

Woman < 34 weeks GA at risk of birth in the next 7 days should be offered dexamethasone ONLY when:

1. High confidence that GA < 34 weeks
2. High confidence that she has a condition likely to lead to birth in the next 7 days
3. There is no suspicion of maternal infection (chorioamnionitis or sepsis)

4. Adequate preterm care is available for the newborn: resuscitation, thermal care, feeding support, infection treatment, and safe oxygen use

A course of treatment includes 12 mg dexamethasone IM as soon as possible, followed by another 12 mg IM 24 hours later:

- Some benefit is seen after a few hours. Benefit peaks 48 hours after the first dose and lasts approximately 7 days.
- Do not delay delivery if necessary for safety of mother or fetus.

A single repeat course is recommended if:

- Birth does not occur within 7 days of the first dose
- GA is still < 34 weeks
- Clinical assessment finds there is high risk of birth in the next 7 days

More than two courses can be harmful to the fetus.

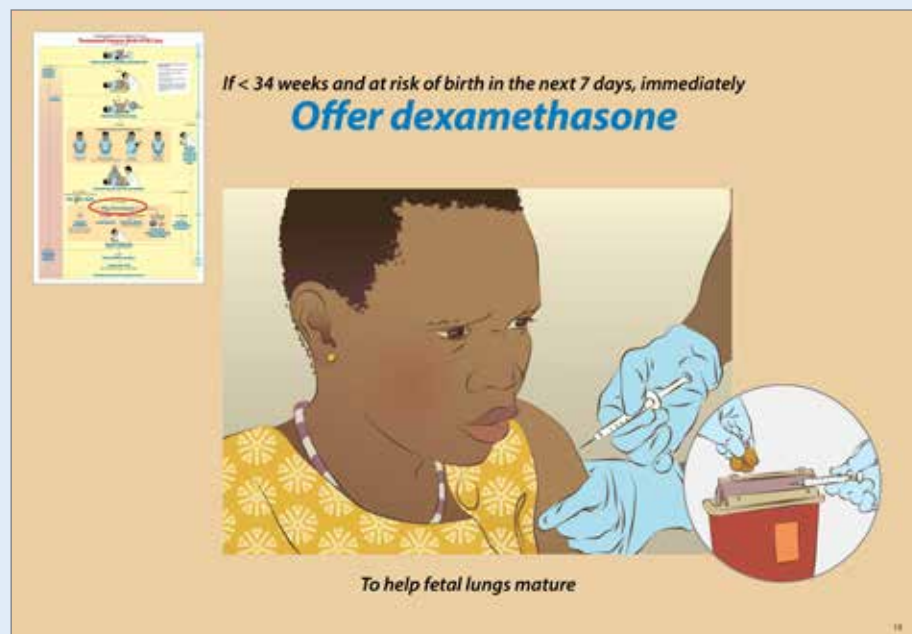
Women with diabetes may be given antenatal corticosteroids:

- Closely manage blood glucose and expect an increased insulin need

Invite Discussion

1. Share experiences using dexamethasone for threatened PTB.
2. What do you think about using dexamethasone for threatened PTB in your facility?
3. What could help providers in your facility use it correctly and consistently?
4. How will you know if you are using it correctly and consistently?

Because overuse of dexamethasone may lead to serious outcomes, including increased neonatal deaths, be sure to discuss the reasoning behind the four criteria for use of ACS and check understanding of the participants.



Background

Considerations: ACS has been used safely and effectively in many developed countries for more than 40 years. There are > 20 randomized controlled clinical trials supporting its use to improve survival of preterm infants in high-resource settings (Roberts and Dalziel 2006). In 2014, the ACT trial (Althabe et al.) tested a broad-based implementation strategy that included initiation of ACS at the community level in six countries with 100,000 women. The structure of the intervention led to vast overtreatment. The study found an increased risk of sepsis for mothers given ACS as well as increased neonatal mortality in infants born > 25th percentile for weight. Weight was used as a proxy for gestational age due to poor dating. It is not clear what caused the increase in neonatal mortality. Based on these findings, ACS should only be initiated where essential services are available for preterm infants and maternal infections can be reliably and promptly identified and treated, and when the conditions leading to PTB and GA can be accurately diagnosed.

Comorbidities: Women with diabetes may be given antenatal corticosteroids. Closely monitor blood glucose and expect an increased insulin need. Women on

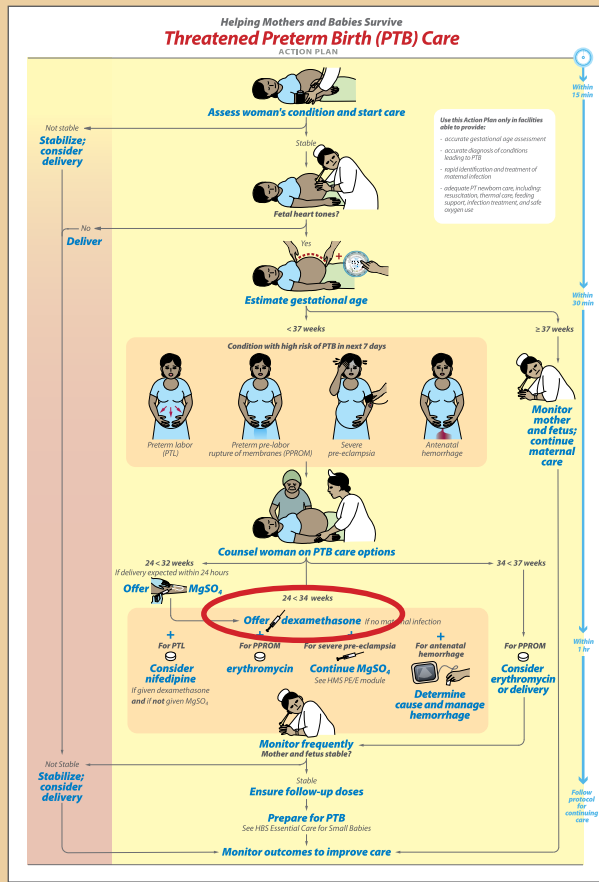
chronic steroids may need an additional or higher dose ("stress dose") of their steroids at the time of delivery. Current WHO guidelines (2015) recommend against the use of ACS in women with ongoing systemic infections such as chorioamnionitis or TB.

Recommended dosing for ACS is 24 mg IM in divided doses: 12 mg IM every 24 hrs, two times, is recommended for ease of administration, but other divided dose regimens are also acceptable. Another common regimen is 6 mg IM every 12 hours, four times.

Betamethasone can also be used following the same regimen but it is less available and more expensive than dexamethasone. Other steroids do not cross the placenta and therefore are not effective. There is not sufficient evidence to support other routes of administration. Rotate injection sites.

Educational Advice

Dexamethasone generally comes in 4 mg vials, but other dosages are available. Ask participants and/or check what is available at their facility. Ask how they would draw up 12 mg for an IM injection.



If < 34 weeks and at risk of birth in the next 7 days, immediately
Offer dexamethasone



To help fetal lungs mature

If < 32 weeks and at risk of imminent birth in the next 24 hrs, immediately

Offer magnesium sulfate (MgSO₄)

Explain

Exposure to MgSO₄ before preterm birth provides neuroprotection to decrease the incidence and severity of cerebral palsy (motor dysfunction).

Maternal side effects are common but severe toxicity is RARE:

- Warn the woman that most patients will experience sweating, flushing, headache, and nausea. It is normal to feel warmth throughout the body from MgSO₄.
- May see slight decrease in fetal heart rate.
- Respiratory or cardiac arrest is **very rare**.

All women < 32 weeks GA and at high risk of PTB in the next 24 hours should be offered MgSO₄, including immediately prior to birth:

- Do not give MgSO₄ to women with known cardiac problems or myasthenia gravis
- For women with impaired renal function, only give the loading dose

MgSO₄ regimens used for pre-eclampsia can also be used for neuroprotection.

Loading dose:

- Establish and maintain IV line with isotonic solution (LR or normal saline)
- Use **20%** MgSO₄ solution to give 4 g IV loading dose over 10–15 minutes (20 mL)
- Then immediately use **50%** MgSO₄ solution to give 5 g IM in each buttock (total 10 g)

Maintenance doses:

- 5 g IM using 50% solution every 4 hours in alternating buttocks
- Stop after birth or 24 hours, whichever comes first (unless the woman also has severe pre-eclampsia)

Always use 20% solution for IV and 50% solution for IM:

- If available, add 1 mL of 2% lidocaine to each IM injection to reduce pain

Monitor for magnesium toxicity hourly and record findings. Stop or delay maintenance dose if:

- Patellar reflex absent

- Respirations < 16 per minute
- Urine output < 30 mL/hr over the past 4 hours

For respiratory depression assist ventilation with bag and mask and give calcium gluconate 1 g IV (10 mL of 10% solution) over 3 minutes.

If birth does not occur, do not re-treat with MgSO₄.

Invite Discussion

1. Share experiences using MgSO₄—what regimen do you use?
2. What do you think about using MgSO₄ for neuroprotection in your facility?
3. What could help providers in your facility use it correctly and consistently? What criteria will you use to identify women at high risk of imminent birth within the next 24 hours?
4. How will you know if you are using MgSO₄ for neuroprotection correctly and consistently?



Background

Cerebral palsy is caused by poor development or damage to the motor areas in the brain. It disrupts the brain's ability to control movement and posture. When given in utero, MgSO₄ decreases the risk that a baby born preterm will develop cerebral palsy. It should be given to all women < 32 weeks GA at risk of imminent PTB regardless of the number of babies in utero or the reason for the PTB.

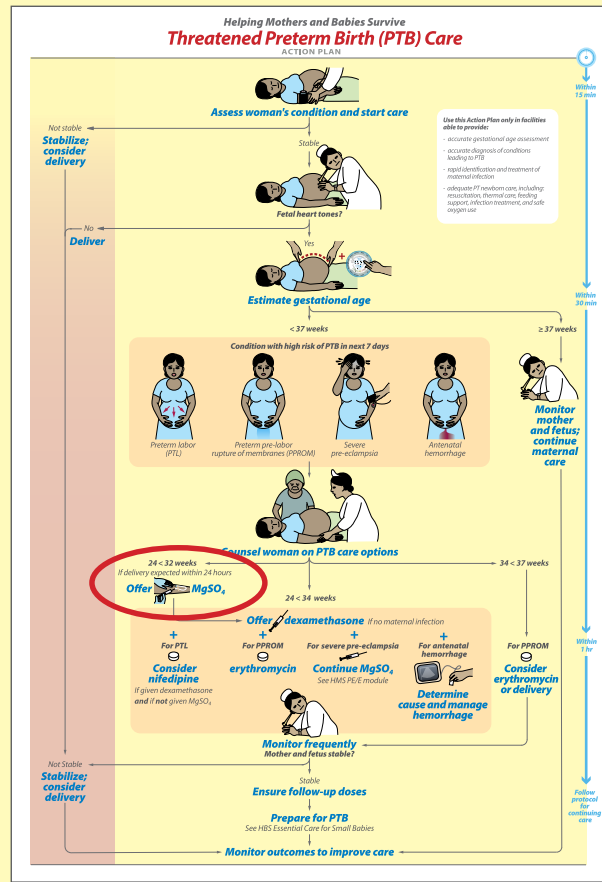
Use should be reserved for those at high risk of delivery within 24 hours, not all women diagnosed with PTL or PPRM. Retreatment is not recommended.

Consider using a separate magnesium sulfate monitoring sheet for each patient on MgSO₄. See pg. 57 of the Provider Guide for an example. Most patients will experience side effects, but severe toxicity such as cardiac or respiratory arrest is rare. **Side effects may be increased if MgSO₄ is given with beta agonists or calcium channel blockers such as nifedipine.** MgSO₄ should not be given to women with myasthenia gravis or known cardiac problems. Women with impaired renal function should be given

the initial loading dose but should not be given maintenance therapy, as they may develop magnesium toxicity. An IV-only regimen, 4 g IV loading dose followed by 1g/hr maintenance dose, has been more widely studied for neuroprotection. However, this regimen requires increased monitoring and is not widely recommended where IV pumps are unavailable due to the difficulty of precisely monitoring IV flow rate as is required for maintenance dosing. If the IV regimen is used and the drip rate is set manually, have a colleague double-check the drip calculation and drip rate when the infusion is started. Recheck the drip rate and signs for toxicity every 30 minutes.

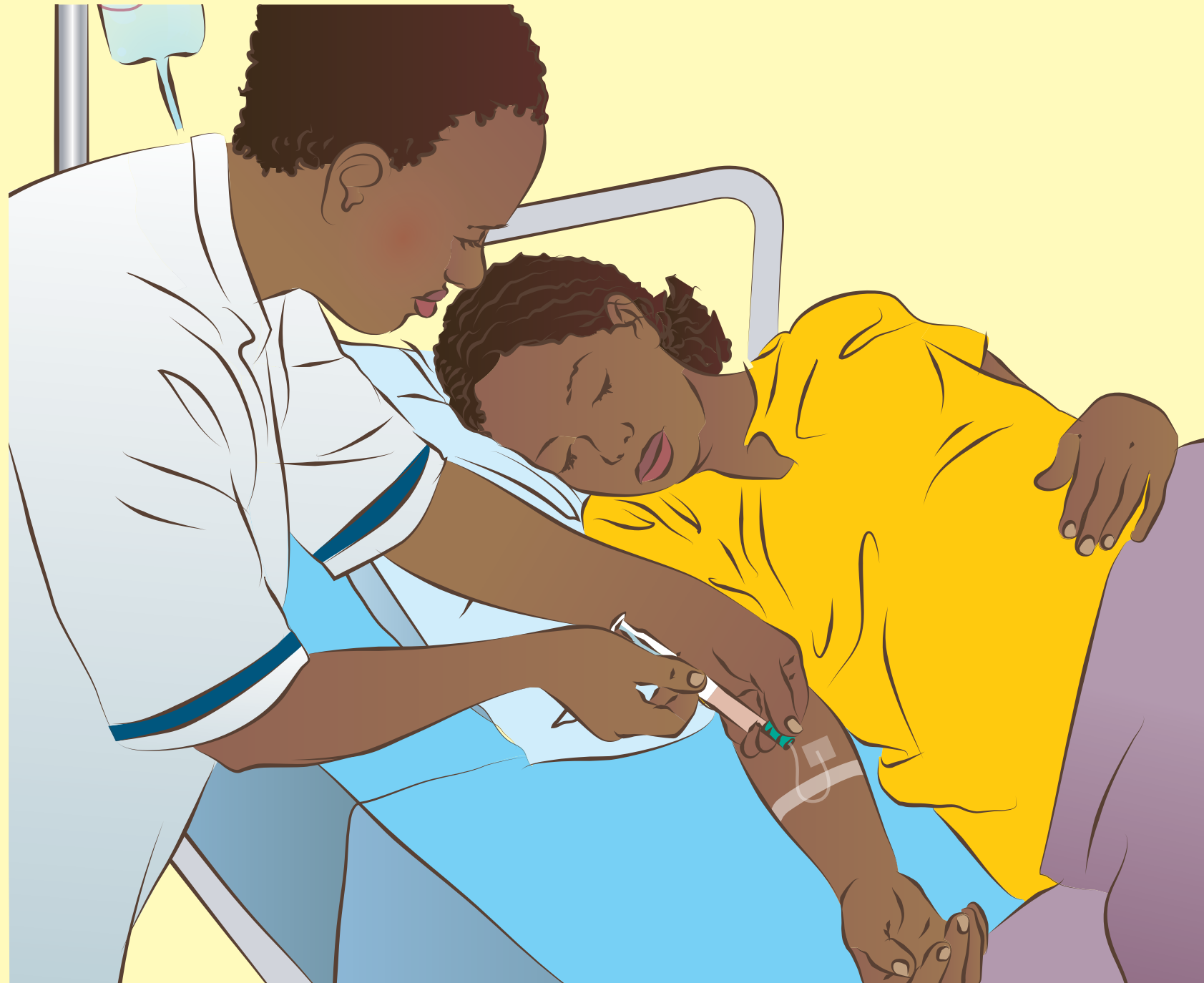
Educational Advice

Use the experience of participants in the room to facilitate discussion about the use of MgSO₄ for neuroprotection. This is likely a new use of MgSO₄ for many providers. They may have concerns about using it. If possible, let other participants answer questions and concerns.



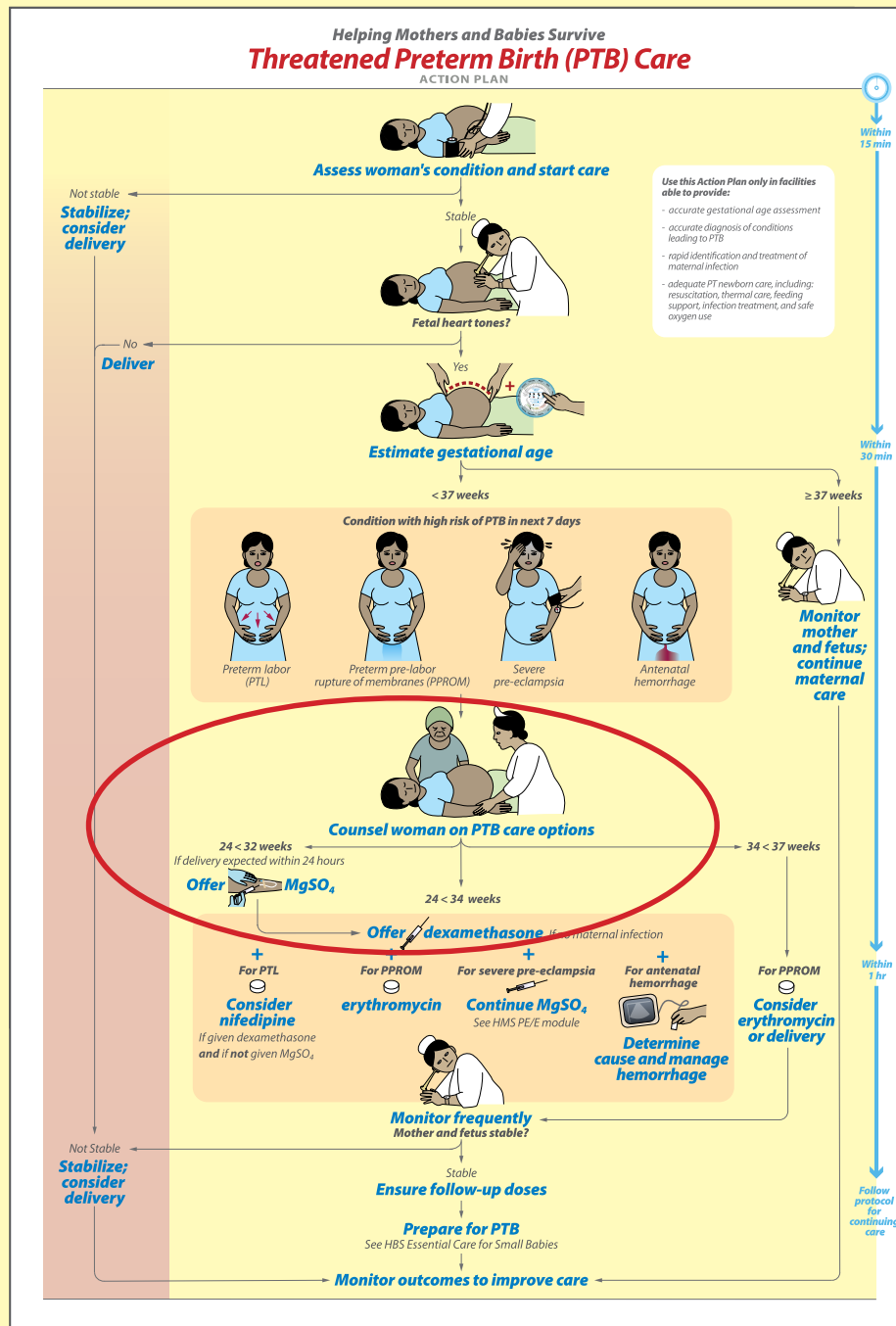
*If < 32 weeks and at risk of imminent birth
in the next 24 hrs, immediately*

Offer magnesium sulfate (MgSO₄)



To prevent cerebral palsy in preterm babies

Exercise: Counsel woman, prepare and give loading dose of MgSO₄



Have administration materials ready ahead of time:

Model to simulate starting an IV and giving injections (fruit works)



Clean gloves



MgSO₄ 20% and 50% solution (or labelled mock substitute)



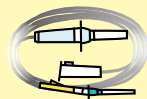
20 mL syringe with IM needle



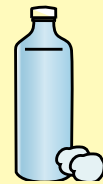
Sterile water



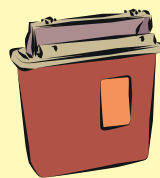
Lidocaine, 2%



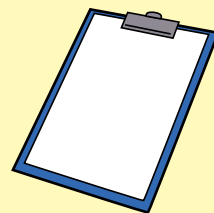
Supplies for starting an IV line



Spirits (rubbing alcohol) and cotton balls



Safe disposal system



Form to document administration

Part One—Counsel

1. Explain options, including doing nothing
2. Explain benefits, risks, side effects, and uncertainties; warn her that she may experience a feeling of warmth and that the injections will be painful
3. Check for understanding; ask for any questions
4. State your recommendation and explain what you will do
5. Ask permission to start care

Part Two—Administer 4 g MgSO₄ 20% solution IV

1. Wash hands, put on clean gloves
2. Clean the injection site
3. Using sterile technique and a 20 mL sterile syringe, draw either:
 - 20 mL of 20% solution
 - OR
 - 8 mL (4g) of 50% solution + 12 mL sterile water (to make 20% solution)
4. Slowly administer the full 20mL by IV injection over 10–15 minutes
4. Dispose of used needle, syringe, and opened vials in a puncture-proof container

Part Three—Administer 5 g MgSO₄ 50% solution IM in each buttock

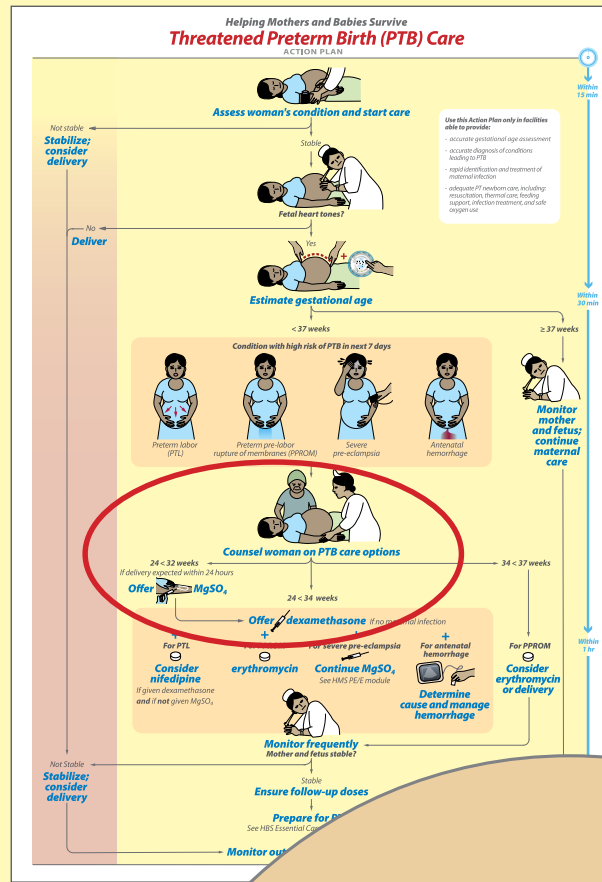
1. Draw 10 mL (5g) MgSO₄ 50% into the syringe using sterile technique
2. Add 1 mL of 2% lidocaine
3. Clean injection site
4. Give deep IM injection in buttock
5. Dispose of used needle, syringe, and opened vials in a puncture-proof container
6. For both IV and IM, document time, medication, route, amount, and site

Remember to monitor before every maintenance dose.

Educational Advice Demonstration

Use a co-facilitator or ask for a volunteer to help with the demonstration. Highlight the challenges in correct administration of MgSO₄ related to variable concentrations and packaging. Demonstrate and review use with the MgSO₄ available at the facility where you are training. If the facility is planning to follow the IV-only regimen, have participants practice using IV pumps or calculating and starting manual drip rates.

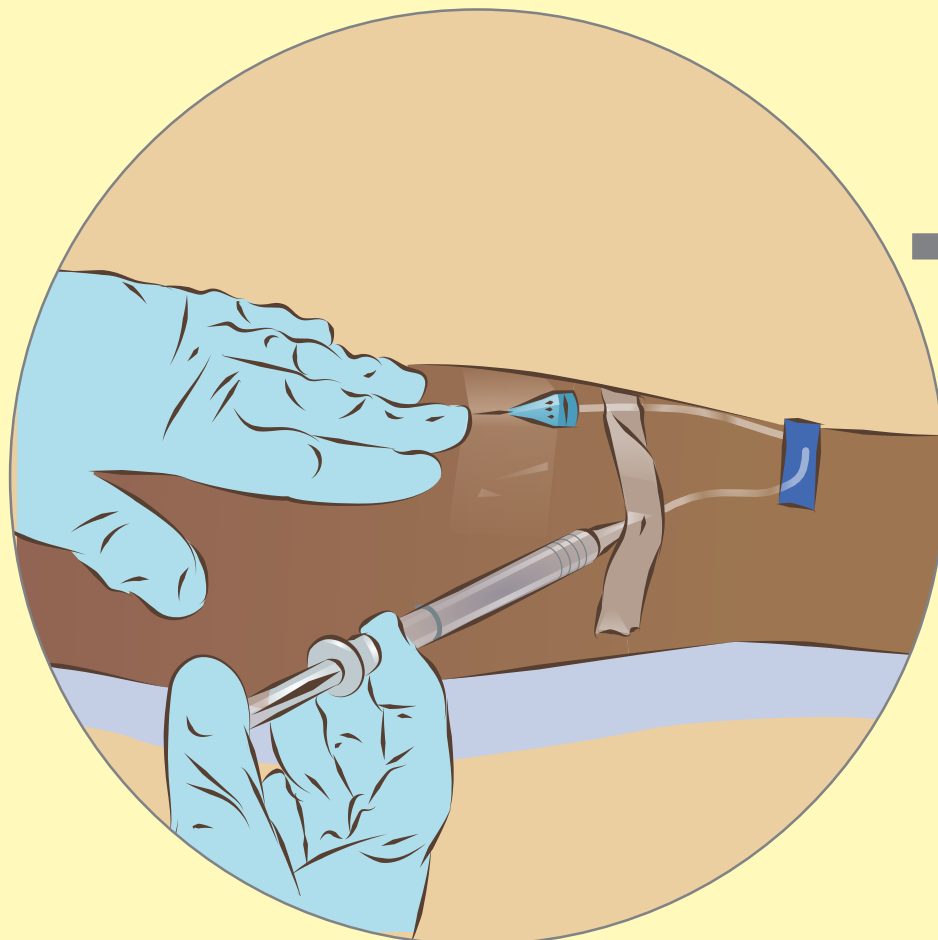
Say what you are doing out loud. This helps with learning. Do the demonstration exactly as you would with a real patient. You can simulate handwashing with a drawing of a sink. SHOW how to draw up and administer medication. Various fruit can be used to practice deep IM injection.



Exercise:
**Counsel woman,
prepare and give loading dose
of magnesium sulfate**



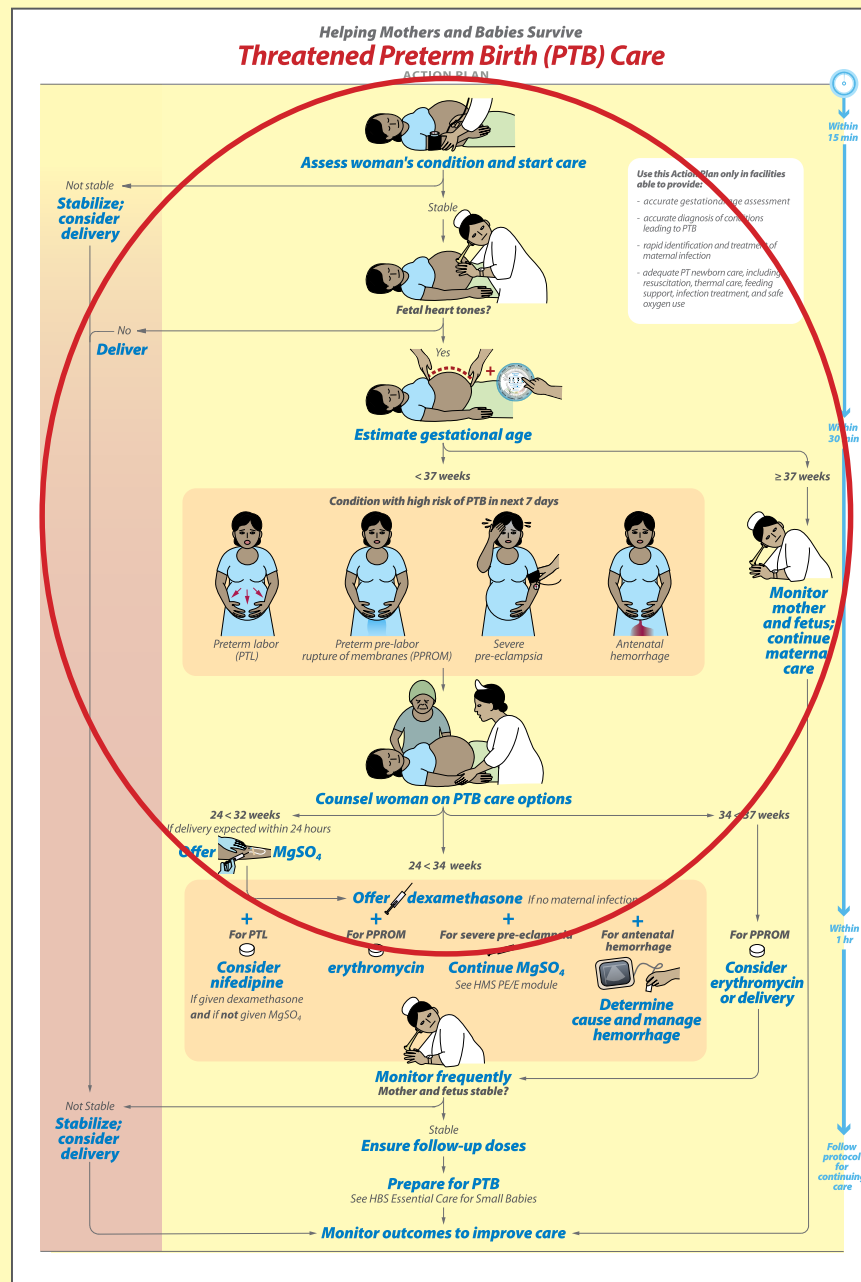
Counsel woman



Prepare and give loading dose

Exercise: Deciding to initiate dexamethasone and MgSO₄

Note: A fetal heartbeat is present in all cases, and adequate preterm newborn care is available



Educational advice

This exercise will give learners the opportunity to synthesize the new information they have learned and practice using the Action Plan. Divide participants into small groups of 4–6 with a facilitator in each group, OR divide into pairs with facilitators walking around. Ask participants to look at pgs. 30–31 of the Provider Guide. For each case, they should decide whether or not to initiate dexamethasone and/or MgSO₄.

Review answers in a large group. Ask participants to explain their decision. Comments in blue are to help guide discussion.

- A woman at 31 weeks' gestation with ruptured membranes (clear fluid pooling in the posterior fornix of the vagina when sterile speculum exam is done). She is not contracting.

MgSO₄
NO: Wait until delivery imminent within 24 hours.

Dexamethasone
YES: < 34 weeks GA with PPROM.
- A woman at 29 weeks' gestation with a fever of 39 degrees contracting every 3 minutes and cervix 3 cm dilated.

MgSO₄
YES: < 32 weeks, likely to deliver within 24 hours.

Dexamethasone
NO: Signs of potential maternal sepsis.
- A woman with light vaginal bleeding at 33 weeks' gestation by unsure LMP and fundal height 38 cm. No ultrasound is available.

NO for both: Without more information, low confidence that GA is < 34 weeks.
- A woman with a blood pressure of 165/115, severe headache, 3+ proteinuria, 31 weeks by LMP and a fundal height of 29 cm.

YES for both: < 32 weeks and meets criteria for severe PE.
- A woman at 28 weeks' gestation, with uncontrolled diabetes mellitus contracting every 4 minutes and cervix 4 cm dilated.

YES for both: < 32 weeks, likely to deliver within 24 hours. Loading dose of MgSO₄ can be safely given, be cautious with maintenance dosing due to potential renal insufficiency from diabetes. Monitor blood sugars closely and anticipate need for additional insulin related to dexamethasone.
- A woman with heavy vaginal bleeding and no signs of labor who is 31 weeks by LMP and 34 weeks by fundal height.

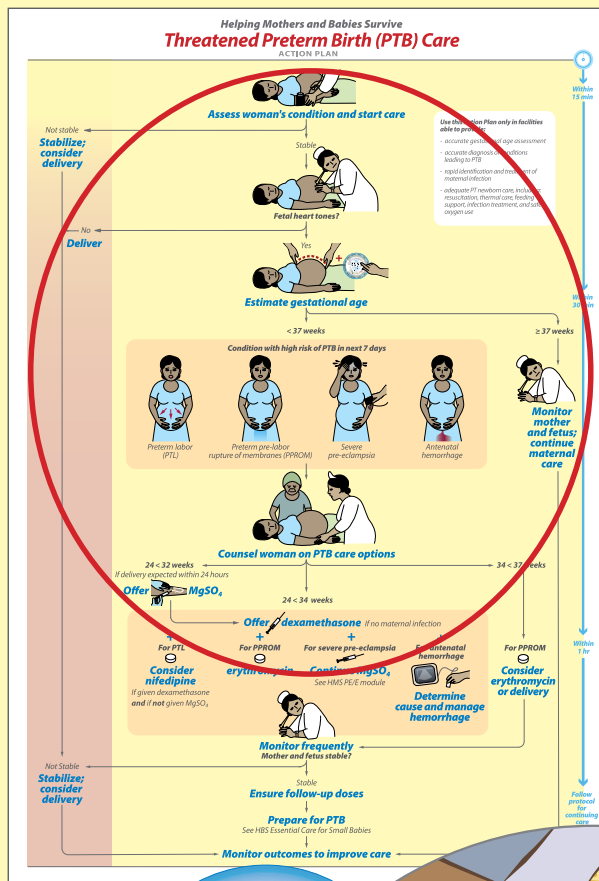
YES to both: You are likely to deliver her within 24 hours due to hemorrhage; LMP and fundal height agree within 3 weeks, so use LMP.
- A woman at 30 weeks who has had 2 previous preterm deliveries and is scared she will have another. She has no symptoms or signs of a condition leading to birth in the next 7 days.

NO to both: Only initiate threatened preterm birth care when there is an immediate increased risk of preterm birth. Effects of dexamethasone last approximately 1 week.
- A woman at 31 weeks' gestation who seized on arrival.

YES to both: Assume eclampsia and follow PE/E protocols. Stabilize mother and give MgSO₄ first, then give first dose of dexamethasone while preparing for delivery. Do not delay delivery for second dose.
- A woman who complains of feeling a large gush of vaginal fluid who is 35 weeks by LMP and has a fundal height of 33 cm.

NO to both: LMP and fundal height agree, so use LMP, which is > 34 weeks.
- A woman at 29 weeks' gestation with a twin pregnancy. She has irregular light contractions. Her cervix is noted to be 1 cm dilated.

NO to both: Does not meet criteria for preterm labor; continue monitoring. If preterm labor is diagnosed, initiate dexamethasone. If delivery is imminent within 24 hours, initiate MgSO₄.



Exercise

Deciding to initiate dexamethasone and MgSO₄



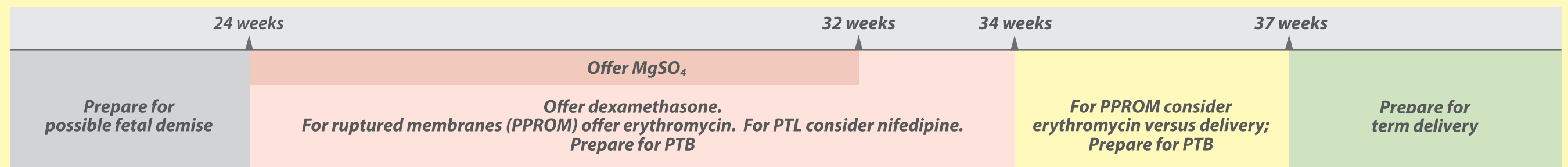
Determine gestational age



Identify condition with increased risk of preterm birth



Start MgSO₄ and/or dexamethasone



Offer nifedipine

Explain

Nifedipine is used to slow down or stop contractions. It will not prevent preterm birth, but may delay labor long enough to:

- Get benefit of dexamethasone
- Transfer a patient

Maternal side effects are common and related to nifedipine being a peripheral vasodilator:

- Headache is the most troubling side effect; consider giving paracetamol with nifedipine
- Nausea, flushing, dizziness, and palpitations are also common
- There are no known fetal side effects

Women with preterm contractions and cervical change who have received dexamethasone can be offered nifedipine.

Do not give nifedipine to women:

- With cardiac problems
- In active labor
- Receiving MgSO₄ or another tocolytic
- If prolonging pregnancy is dangerous to woman or baby

Suggested regimen: Loading dose of 20 mg (standard/immediate release) followed by 10–20 mg every 4–8 hours. Local protocols may vary. Ensure that:

- The formulation is standard (immediate) and not slow release
- Maximum dose is 180 mg/day
- Woman is monitored for excessive drop in blood pressure, and medication is reduced or held if necessary
- Nifedipine is stopped 48 hours after the first dose of dexamethasone is given

For women with PTL, also:

- Ensure adequate fluid intake
- Keep hospitalized
- Minimize vaginal exams to prevent infection

Invite Discussion

1. Share experiences using nifedipine for tocolysis (to halt or slow down labor contractions).
2. What do you think about using nifedipine for tocolysis in your facility?
3. What could help providers in your facility use it correctly and consistently?
4. How will you know if you are using it correctly and consistently?



Background

When compared to placebo, tocolytics prolong pregnancy but do not prevent preterm birth. Neither have they been demonstrated to improve infant outcomes. Because of this, WHO does not recommend use of tocolytics for improvement in infant outcomes, but recommends nifedipine if a tocolytic is to be used. In direct comparisons, nifedipine is safer and more effective than betamimetics (WHO, 2015).

Drug class: Nifedipine is a calcium channel blocker. Other classes of drugs such as betamimetics, COX inhibitors, and oxytocin receptor antagonists are also used as tocolytics. Most comparisons between drug types have not shown significant differences. However, betamimetics should not be used with patients who have cardiovascular or metabolic conditions, and COX inhibitors should only be used when there is very high confidence that the GA is < 32 weeks.

Considerations: Tocolytics should not be given to patients in active labor (> 4 cm dilation) or who need to be delivered quickly (for example those with severe PE/E or signs of intrauterine infection [chorioamnionitis]). Use of more than one tocolytic drug at a time increases risks for both mother and baby and has not been shown to improve outcomes.

Nifedipine should not be given with MgSO₄ for use as a tocolytic. It does not provide additional tocolytic benefit and there is an increased risk of adverse side effects. Nifedipine may be used with MgSO₄ to treat hypertensive crisis.

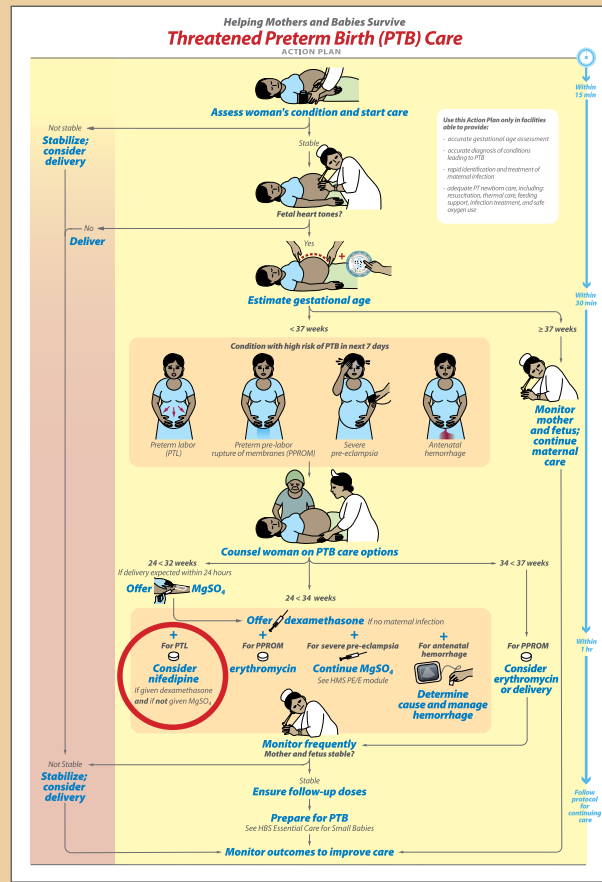
Nifedipine comes in two formulations. Slow-release nifedipine is used for chronic hypertension. Standard- or immediate-release should be used for both hypertensive crisis and tocolysis. Slow-release will not achieve the rapid effect needed for these conditions.

Regimen: There is no universal standard regimen for nifedipine. Local protocols may vary and can be followed as long as the maximum daily dose is not exceeded and women are monitored and managed for side effects. Administering more than 30 mg at one time should be avoided.

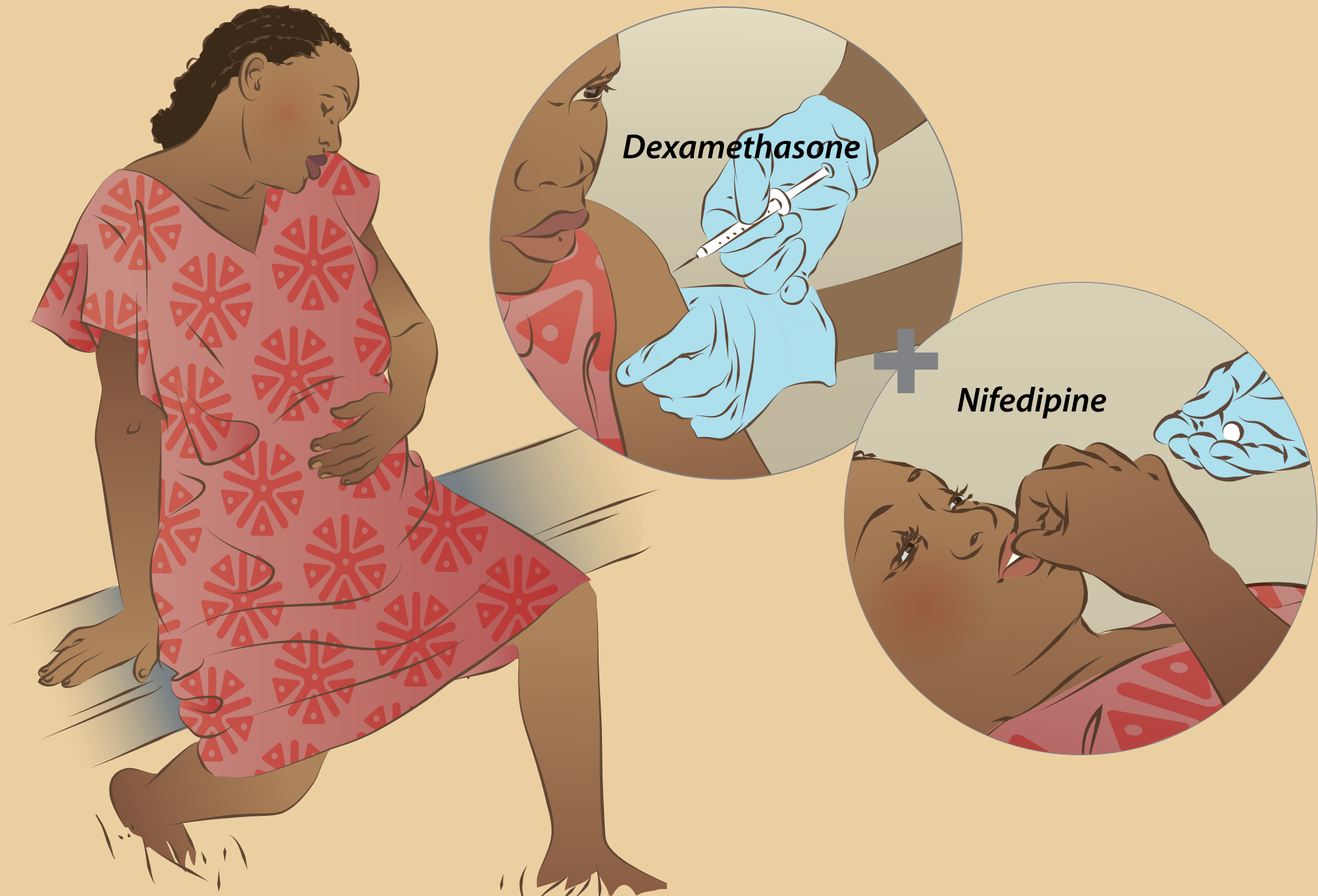
Educational Advice

Provide learners with the dosing regimen that they are to follow based on facility or national protocol.

Use the experience of participants in the room to facilitate discussion about the use of nifedipine. If possible, let other participants answer questions and concerns. Facilities or providers may choose not to use tocolytics due to their maternal side effects and lack of proven efficacy in improving neonatal outcomes.



If in labor and given dexamethasone **but not given MgSO₄**
Offer nifedipine



To delay labor 24–48 hrs for antenatal corticosteroids to work

If < 37 weeks and membranes have ruptured

Offer erythromycin

Explain

Antibiotics delay delivery and help prevent infection-related problems in women with PPROM:

- Approximately one-third of women with PPROM develop infections.
- Infections are more common at earlier GA and increase prematurity-related problems for the baby.

Allergic reactions are the most common serious side effect:

- Ask about previous reactions to antibiotics.
- Diarrhea, nausea, and vomiting are potential side effects of many antibiotics.

Offer erythromycin to women < 37 weeks GA with ruptured membranes:

- Diagnosed by typical odor of amniotic fluid or visual inspection with high-level disinfected speculum. **No digital exams!**

For prophylaxis give erythromycin 250 mg four times per day for 10 days:

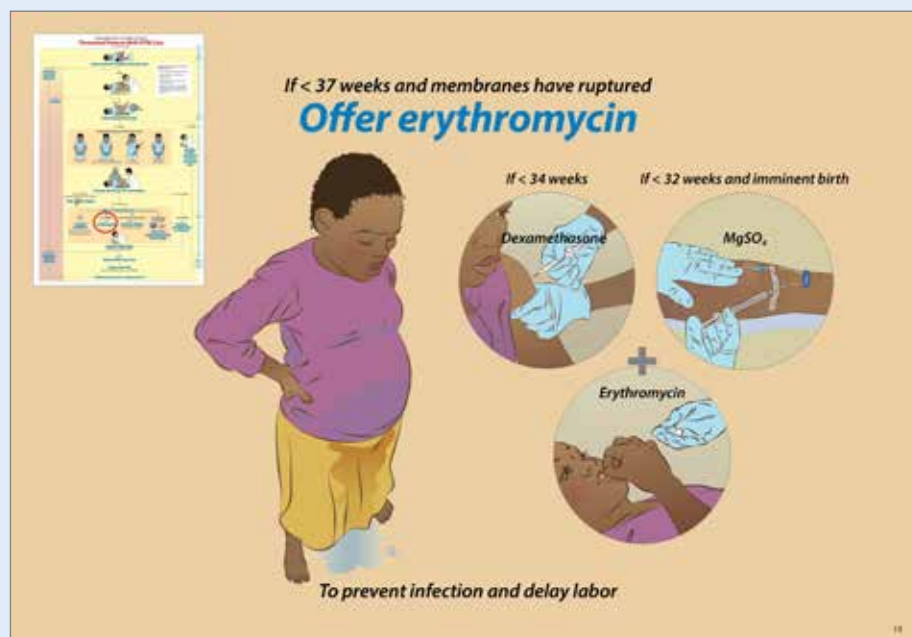
- If erythromycin is unavailable, use a penicillin, such as amoxicillin (check for allergies). **DO NOT** use co-amoxiclav/Augmentin due to increased risk of necrotizing enterocolitis.
- Monitor for maternal infection; if any signs of infection, change to:
 - Ampicillin 2 g IV every 6 hrs and
 - Gentamycin 5mg/kg IV every 24 hrs
- Stop antibiotics after vaginal birth.

For women with PPROM also:

- Keep hospitalized and limit activity
- Do not do digital exams
- Monitor closely for infection
- Deliver by 37 weeks

Invite Discussion

1. Share experiences using antibiotics for PPROM.
2. What do you think about using erythromycin for women with PPROM in your facility?
3. What could help providers in your facility use it correctly and consistently?
4. How will you know if you are using it correctly and consistently?



Background

Preterm prelabor rupture of membranes is associated with one-third of PTBs. The majority of pregnancies with PPROM deliver within 1 week of rupture.

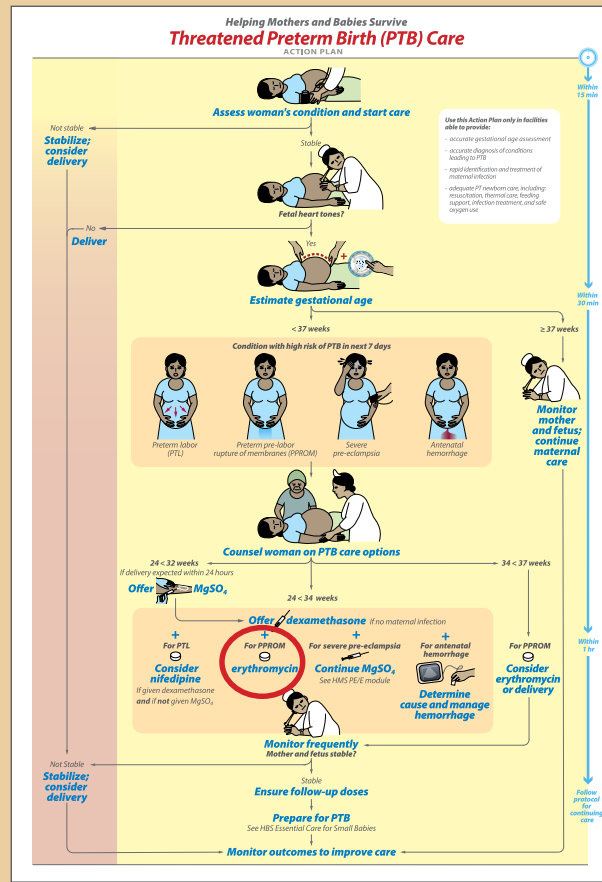
Antibiotic benefits and harms: Antibiotics given to women with PPROM reduce chorioamnionitis, neonatal infection, and brain abnormalities in the baby. They also increase the time to delivery. Research shows no benefit and possible harm from giving antibiotics to women in PTL without PPROM, GBS, or signs of infection.

Diagnosis: Classic presentation is a sudden gush of fluid but some patients will describe constant leaking of small amounts of fluid or a general sensation of wetness. Diagnosis is based on seeing amniotic fluid in the vagina. Use a high-level disinfected speculum to look. Remember to exclude urinary incontinence. If amniotic fluid not seen in the back of the vagina, ask the woman to push on her fundus, perform Valsalva maneuver or cough.

Complications: Infections are more common at earlier GAs and increase prematurity-related problems such as cerebral palsy. PPROM is also associated with an increased risk of abruptio placentae, fetal malpresentation, and prolapse of the umbilical cord.

Drug regimen: Co-amoxiclav is not recommended due to increased rates of necrotizing enterocolitis. If GBS status is known and is positive, use antibiotics to cover for GBS. Erythromycin alone is not recommended to treat infection.

Management: Keep patient hospitalized and limit activity. To reduce risk of infection, do not perform digital exams. Monitor for signs of infection. Deliver patient for overt maternal infection, abruptio placentae, or nonreassuring fetal status or once potential morbidity related to PPROM is greater than the potential morbidity associated with preterm birth. This GA will vary between institutions but will likely be between 34 and 37 weeks. Induce patient using standard procedures unless a cesarean is otherwise indicated.



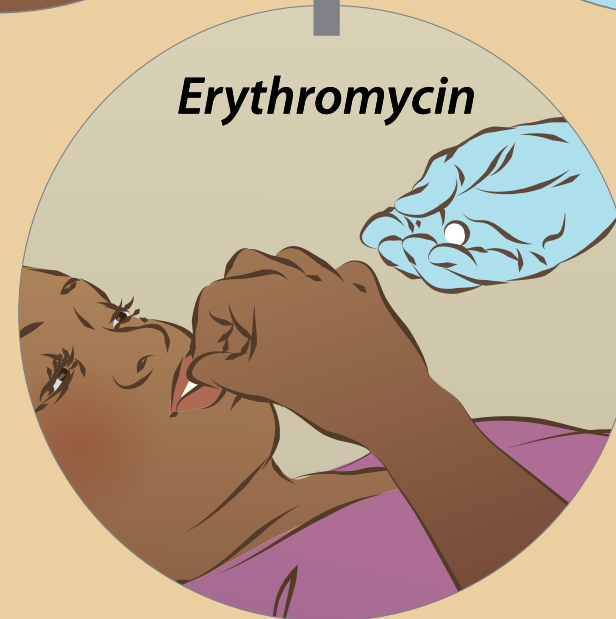
If < 37 weeks and membranes have ruptured
Offer erythromycin



If < 34 weeks



If < 32 weeks and imminent birth

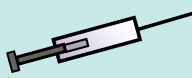

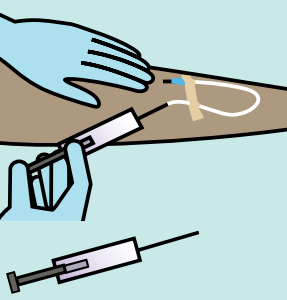




To prevent infection and delay labor

Threatened Preterm Birth Care - Medication Information

Educational Advice

This exercise will give participants the opportunity to practice counseling techniques while reviewing the key points associated with each medication. If not done already, post the counseling checklist somewhere visible to all and/or refer participants to page 23 in the Provider Guide. Have participants work in groups of four. Tell them to use the Medication Chart (pg 58) as a guide. The groups should divide the four interventions among themselves, with each person taking a turn role-playing the provider counseling a woman and her support people. At the end of each role-play, the group should discuss what went well and what could be improved (debrief). Facilitators should sit with each group through at least one full role-play and debrief. At the end, ask the the large group if there are any new questions.

	Eligibility	Benefits Side effects and risks	Regimen
Dexamethasone <i>for lung maturity</i> 	<ul style="list-style-type: none"> • High confidence GA viability < 34 weeks • High confidence likely to deliver in 7 days • No suspicion of maternal sepsis or chorioamnionitis • Advanced preterm postnatal care is available: resuscitation, thermal care, feeding support, infection treatment, and safe oxygen use 	<p>Can reduce death in preterm babies by 30% by:</p> <ul style="list-style-type: none"> • Maturing fetal lungs • Protecting fetal intestines and blood vessels in the brain <p>May increase risk of:</p> <ul style="list-style-type: none"> • Maternal sepsis • Perinatal mortality in infants born at term 	<p>24 mg IM in divided doses</p> <p>Recommended: 12 mg IM every 24 hrs x 2</p> <p>May also use: 6 mg IM every 12 hrs x 4</p>
Repeat Dose (one time only) 	<ul style="list-style-type: none"> • It has been > 7 days since the first dose • GA is still < 34 weeks • There is a high risk of birth within 7 days based on a new clinical assessment • Patient has only received one prior course 	<p>Benefits disappear after 7 days, repeat dose may restore</p> <p>More than two courses can be harmful to the fetus</p>	<p>May repeat selected regimen one time if all eligibility criteria have been met for a repeat dose</p>
Magnesium sulfate <i>for fetal neuroprotection</i> 	<ul style="list-style-type: none"> • Viability < 32 weeks GA • High risk of birth in the next 24 hours • No known maternal cardiac problems or myasthenia gravis • Do not give maintenance doses to women with impaired renal functioning <p><i>Repeat dose not recommended for neuroprotection. If patient has severe pre-eclampsia, continue MgSO₄ for 24 hours after birth or last seizure, whichever is later.</i></p>	<p>Decreases the risk of cerebral palsy and motor major dysfunction</p> <p>Common side effects:</p> <ul style="list-style-type: none"> • Sweating • Flushing and feeling of warmth • Headache • Nausea • Slight decrease in fetal heart rate <p>Risks:</p> <ul style="list-style-type: none"> • Respiratory or cardiac arrest related to magnesium toxicity (very rare) 	<p>Loading dose:</p> <ul style="list-style-type: none"> • 4 g 20% solution IV loading dose over 10–15 minutes PLUS • 10 g IM 50% solution (5 g in each buttock) <p>Maintenance dose:</p> <ul style="list-style-type: none"> • 5 g 50% solution IM in alternating buttocks every 4 hours for 24hrs or until birth, whichever occurs first <p>Hold if:</p> <ul style="list-style-type: none"> • Respirations < 16/minute • Patellar reflex absent • Urinary output < 120 mL over 4 hours <p>In case of toxicity, give:</p> <ul style="list-style-type: none"> • 1 g IV calcium gluconate over 3 minutes <p><i>If available, add 1 mL of 2% lignocaine to IM doses to decrease discomfort</i></p>
Nifedipine <i>to slow or stop contractions and delay birth 24–48 hours</i> 	<ul style="list-style-type: none"> • High confidence GA < 34 weeks • In preterm labor • Has been given dexamethasone • Is not being given MgSO₄ • No known cardiac problems • Not in active labor • Prolonging pregnancy is not dangerous to woman or baby 	<p>May delay birth by 24–48 hours to get the benefit of dexamethasone or to transport patient</p> <p>Common side effects:</p> <ul style="list-style-type: none"> • Nausea, headache, flushing • Heart palpitations, dizziness <p>Risks:</p> <ul style="list-style-type: none"> • Severe hypotension • Shortness of breath 	<p>Loading dose: 20 mg PO standard release</p> <p>Maintenance Dose: 10–20 mg every 4–8 hours for up to 48 hours</p> <p>Do not exceed 180 mg in 24 hours</p>
Erythromycin <i>for PPROM to prevent infection and delay birth</i> 	<ul style="list-style-type: none"> • GA < 37 weeks (deliver by 37 weeks) • Ruptured membranes • No known allergy to erythromycin <p><i>Monitor closely and change to treatment protocol if signs of infection appear. Does not cover Group B Strep</i></p>	<ul style="list-style-type: none"> • Helps prevent infection, which also reduces prematurity-related problems for baby • Delays delivery <ul style="list-style-type: none"> • Diarrhea, nausea, vomiting • Risk of allergic reaction 	<p>250 mg orally four times per day for 10 days</p> <p>Stop antibiotics after vaginal birth</p> <p><i>If erythromycin unavailable, use a penicillin. Do NOT use co-amoxiclav/Augmentin due to increased rates of necrotizing enterocolitis .</i></p>

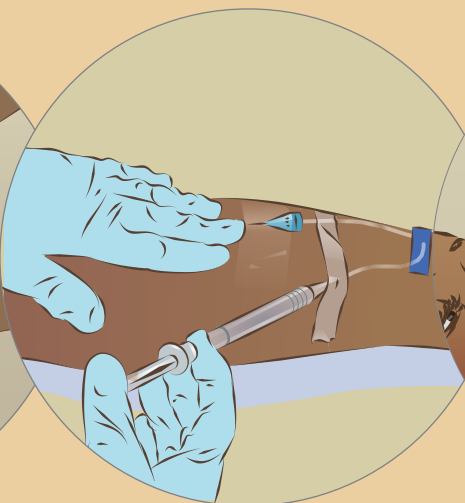
*Never delay delivery for medication if delivery is necessary for the safety of the mother or fetus

Exercise

Practice counseling four interventions



Dexamethasone



MgSO₄



Nifedipine



Erythromycin

Continue MgSO₄ until 24 hours postpartum or after the last convulsion, whichever is later

Explain

The same MgSO₄ regimen can be used for neuroprotection and PE/E.

For women with PE/E, it should be continued for 24 hours after birth or last convulsion, whichever is later.

Management of pre-eclampsia depends on severity and gestational age:

- If pre-viable, deliver within 24 hours
- If viable but < 34 weeks and stable, give ACS and continue to monitor closely
- If ≥ 34 weeks OR any of the following develop, deliver within 12 hours:
New signs of severe PE or worsening PE:
 - Uncontrolled severe hypertension

- Severe headache, visual disturbances, or epigastric pain
- Pulmonary edema
- Evidence of worsening renal insufficiency, compromised liver function, or thrombocytopenia
- Eclampsia
- HELLP syndrome (hemolysis, elevated liver enzymes, low platelets)

• Other

- Fetal demise
- Abruptio placentae
- Labor or rupture of membranes

Monitor closely:

PE can progress rapidly and unpredictably. Deliver if there are any signs condition is worsening or eclampsia (fits) develops.

- If < 34 weeks, give the first dose of dexamethasone if not already given, but do not delay delivery. Delaying birth is dangerous for the mother AND baby.

Invite Discussion

1. How do you currently manage someone < 34 weeks with severe PE who is stable?
2. How do you feel about delaying delivery to administer dexamethasone?
3. How will you monitor the woman for signs of worsening pre-eclampsia?



Background

See Helping Mothers Survive: Pre-Eclampsia/Eclampsia for detailed information on diagnosing and managing PE/E.

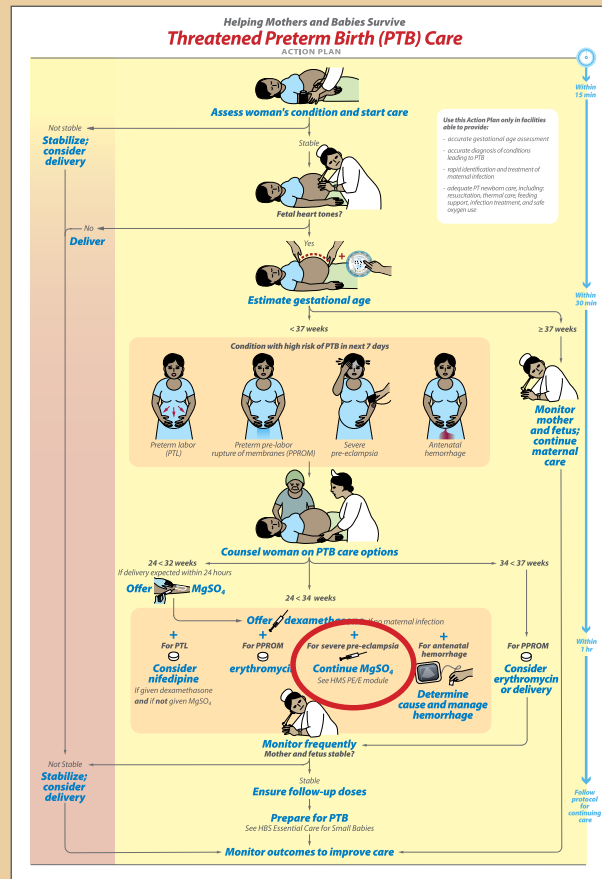
Pre-eclampsia can develop anytime after 20 weeks' gestation and can progress rapidly and unpredictably from mild to severe PE or eclampsia. All women should be assessed for PE/E at every visit. Women diagnosed with PE (BP ≥ 140/90 and ≥ 2+ proteinuria) need increased monitoring and follow-up and should be delivered at 37 weeks. Any woman with PE who has more than one danger sign should be classified as having severe PE and requires MgSO₄ and close monitoring in a hospital. Danger signs include:

- BP ≥ 160/110
- Headache
- Blurry vision
- Breathing problems
- Epigastric pain
- Decreased urine output

Educational Advice

Review the diagnosis for PE and severe PE if needed.

If learners have Android-based smartphones, encourage them to download the Managing Eclampsia app for free. The app was developed to help providers reinforce critical decision-making skills related to managing pre-eclampsia.



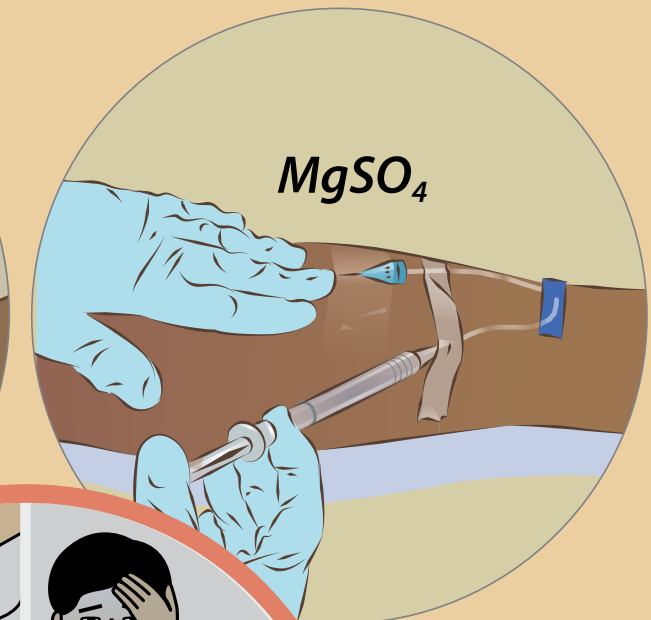
If severe pre-eclampsia/eclampsia

Continue IV MgSO₄ until 24 hours postpartum or after last convulsion



If < 34 weeks

Always use MgSO₄ with severe PE/E



To prevent eclampsia and maternal death

Determine cause of bleeding and manage hemorrhage

Explain

Immediately assess severity and cause of bleeding and start IV access:

- Assess vital signs
- Quantify and describe blood loss
- Assess absence or presence of continuous pain

There are three main causes of antepartum hemorrhage:

- Placenta previa—check by ultrasound
- Placental abruption
- Ruptured uterus

Do not perform a vaginal exam unless placental position has been verified by ultrasound or team is ready for immediate cesarean section:

- Exam can make bleeding significantly worse if the cause is placenta previa

Management depends on the amount and cause of bleeding and gestational age:

- Shock (fast, weak pulse > 110 BPM; systolic BP < 90) = immediate treatment for the mother
- Heavy or continual bleeding = immediate delivery
- Ruptured uterus = immediate surgical management
- Mature or dead fetus = deliver quickly
- Light bleeding = start PTB care and continue to monitor if:
 - In hospital
 - Premature fetus
 - No fetal distress (normal heart rate)

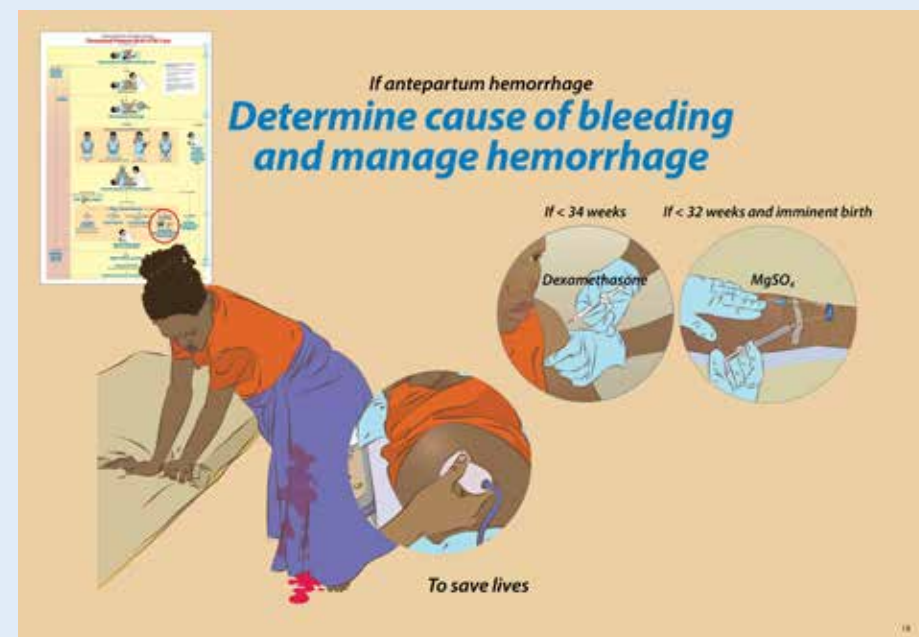
If stable, begin threatened preterm birth care and educate the woman and her family to call for help if the woman:

- Has an increase in bleeding
- Experiences dizziness
- Becomes unresponsive

Continue to assess frequently. Take action if bleeding or vital signs change.

Invite Discussion

1. What would you do if a woman arrived bleeding heavily?
Assess for shock, stabilize, perform vacuum extraction or immediate cesarean regardless of GA.
2. Under what conditions would you initiate PTB management with a woman who is bleeding?
Light to moderate bleeding with no signs of shock or fetal distress and GA < 34 wks.



Background

Further information on diagnosis and management can be found in *Managing Complications in Pregnancy and Childbirth* (WHO and Department of Reproductive Health and Research 2007).

Placenta previa presents with painless bleeding which may be precipitated by intercourse, relaxed uterus, fetal presentation possibly not in pelvis, normal fetal condition.

- Confirm by ultrasound where possible
- Give IV fluids
- For heavy bleeding, perform cesarean
- If low placental implantation and bleeding is light, vaginal delivery may be possible

Placental abruption presents with abdominal pain. Uterus may be tender and/or rigid and there may be signs of fetal distress or demise.

- Assess clotting status
- Transfuse as necessary
- For heavy bleeding and/or abnormal fetal heartbeat, deliver by vacuum extraction if fully dilated, otherwise perform cesarean

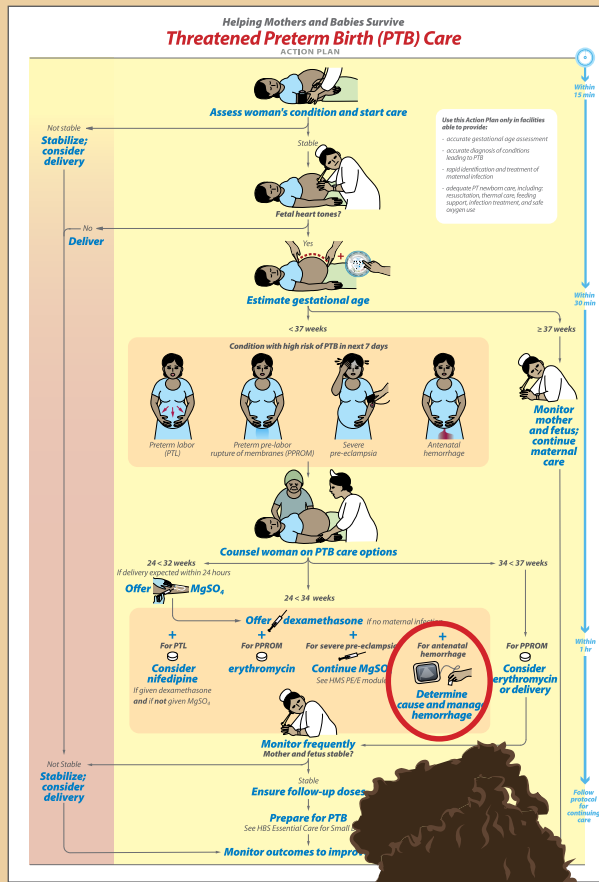
- For light to moderate bleeding with normal or absent fetal heart rate, consider vaginal delivery
- Be prepared for PPH

Ruptured uterus presents with severe abdominal pain and sometimes distension and free fluid, abnormal uterine contour, easily palpable fetal parts, no fetal movement or heart sounds, and rapid maternal pulse.

- Give IV fluids, then immediately perform cesarean section
- Repair uterus if possible
- If repair not possible, perform subtotal hysterectomy

Educational Advice

Allow time in large group discussion to discuss diagnosis and management of antenatal hemorrhage by cause. Participants can refer to pg 39 of Provider Guide for background.

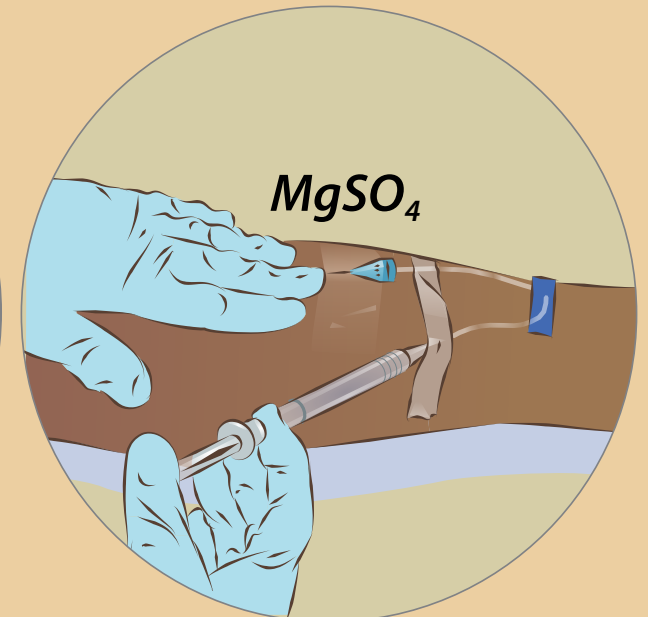


If antepartum hemorrhage

Determine cause of bleeding and manage hemorrhage

If < 34 weeks

If < 32 weeks and imminent birth



To save lives

After initial medication given
Plan for follow-up doses

Explain

Documentation and communication are critical to ensure proper administration and completion of course:

- Always chart drug given, time, dosage, route, injection location, and time next dose is due.
- Use prompts for reminders.
- When changing shift, review patients with oncoming staff. Note when next drug doses are due.
- Tell the mother and/or support people when next doses are due. Encourage them to ask provider if the doses are not given.

Giving higher doses or with greater frequency DOES NOT improve outcomes.

Do not diverge from the recommended protocols for cases of imminent birth.

Do not delay delivery to give remaining doses of any medication if immediate delivery is needed for the safety of the mother or fetus:

- Heavy bleeding
- Worsening pre-eclampsia or eclampsia
- Sepsis or infection of the bag of waters
- Signs of fetal distress

Invite Discussion

1. How do you currently plan for follow-up doses of medication?
2. How and what do you communicate to oncoming staff at change of shift?
3. How could you/your facility improve current practice?
4. How will you know if you've succeeded?

Demonstrate and Facilitate Practice

Strengthen Charting

In small groups, have participants examine their current charting (use format from facility where training is taking place).

Is it easy to both document and find:

- Maternal condition (at risk of PTB?)
- GA
- Actions already taken
- Future actions to be taken (what, when, where, how)
- Outcomes

Can charting be improved?

- Easier or faster to document?
- Clearer to read?



Background

Do not delay delivery if delivery is necessary for the safety of the mother or fetus. Give the first dose while steps are being taken to prepare for immediate delivery.

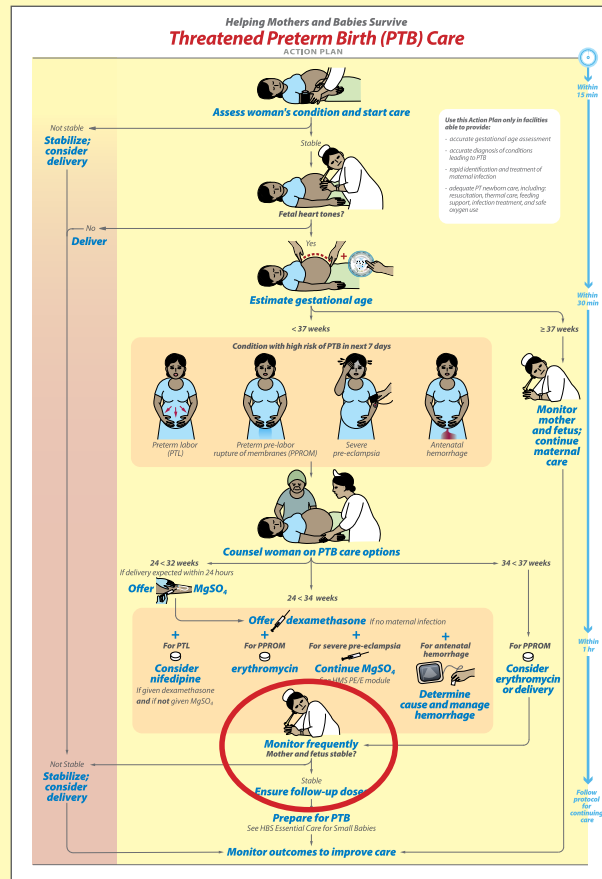
Documentation: Develop prompts to remind providers of upcoming doses. These can be stuck to the outside of charts or written on a ward summary board. Summary boards are large chalkboards or whiteboards where essential information is written for each patient so that all providers can see a "snapshot" of what is happening on the ward. This way everyone can see and call attention to a missed dose.

Referral forms should show doses already given and tell when the next doses are needed.

Hospitalization: Patients should stay at the facility until all doses are given and the condition that brought them in has resolved.

Educational Advice

If charting examples are not available, ask participants to work in groups to develop a sample template. Have each group present the strengths and weaknesses they found. Record all suggestions for improvement. Ask how those changes can be made: Who will be responsible? Make sure the people responsible for changes receive a copy of the suggestions.



After initial medication given
Plan for follow-up doses



To achieve maximum benefit

Exercise: Mastering the Action Plan

CASE 1

Today is April 15. Late at night, a 20-year-old pregnant woman arrives at your district hospital with her husband and mother-in-law. This is her first pregnancy. She is scared and crying. After doing a quick check you find out that she came in because she started “having pains” that come and go in her lower abdomen about 3 hours ago.

Key points:

- Patient is in preterm labor.
- 31 weeks GA by LMP; fundal height agrees — high confidence GA < 32 weeks.
- Rule out PPROM before doing vaginal exam.
- Offer dexamethasone and MgSO₄.
- Only offer nifedipine if patient declines MgSO₄ or it is not available.

CASE 2

Today is April 15. A woman arrives at your hospital with her younger sister, who is 17 years old and crying. The older woman says her sister is pregnant and had “water coming out” early last evening. When the older sister learned of this, she insisted they come to the health center this morning. This is her first pregnancy.

Key points:

- Patient diagnosed with PPROM based on history of large gush of clear fluid and visualization of fluid in posterior fornix with exam using high-level disinfected speculum.
- High likelihood that GA < 37 weeks due to date of marriage. Low confidence < 34 weeks, so do not give dexamethasone or MgSO₄.
- Offer antibiotics for PPROM.
- Monitor closely for infection—deliver if signs of infection or at 37 weeks GA.

CASE 3

Today is April 15. A man arrives with his 32-year-old pregnant wife. This is her fourth pregnancy. He reports that she had a terrible headache for the last few days. This morning, he found her shaking and unable to talk. She is conscious now but does not look well. Quick check uncovers BP of 164/114, FHTs 110s.

Key points:

- Assume she has had eclamptic fit. Give loading dose of MgSO₄ immediately.
- Best estimate GA is 33 weeks by US.
- Offer first dose of dexamethasone as you prepare for

delivery. She should be delivered within 12 hours; do not delay to give second dose.

- Be prepared to manage another eclamptic fit.
- Monitor for magnesium toxicity hourly.

CASE 4

Today is April 15. It is early evening. A 22-yr-old woman presents saying that she is pregnant and bleeding. This is her second pregnancy. She miscarried last year at an early month of pregnancy. Her mother-in-law is with her.

Key Points:

- Likely placenta previa based on bright red, painless bleeding after intercourse and fetus not in pelvis. Confirm by ultrasound if possible.
- High confidence GA 30 weeks 4 days based on sure LMP (birthday).
- Offer dexamethasone. Wait to offer MgSO₄ until delivery expected within 24 hrs. Woman is stable with light bleeding, no need to deliver immediately.
- Monitor bleeding and fluid volume closely.

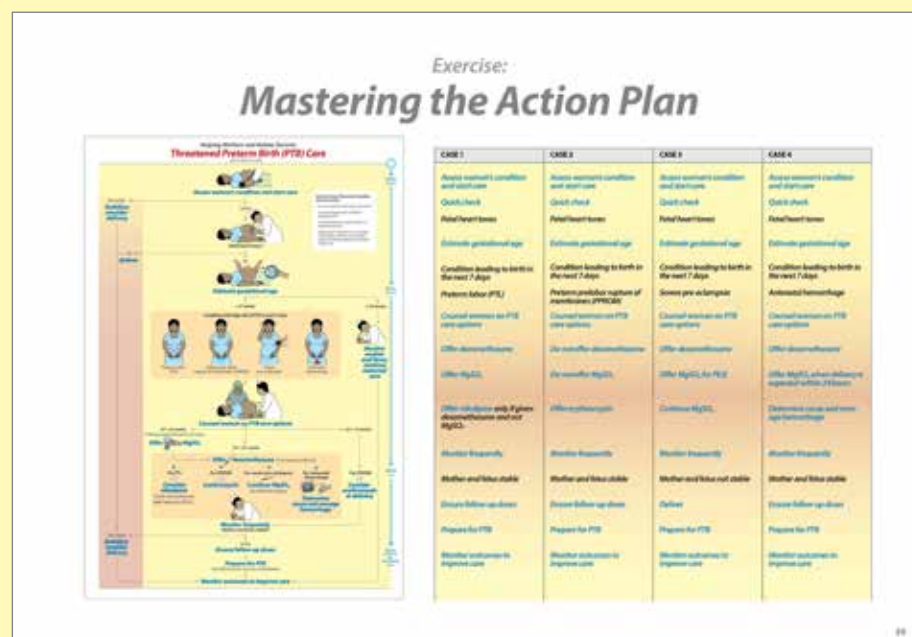
Educational Advice

These unfolding case studies will give learners the opportunity to practice critical thinking skills using the Action Plan.

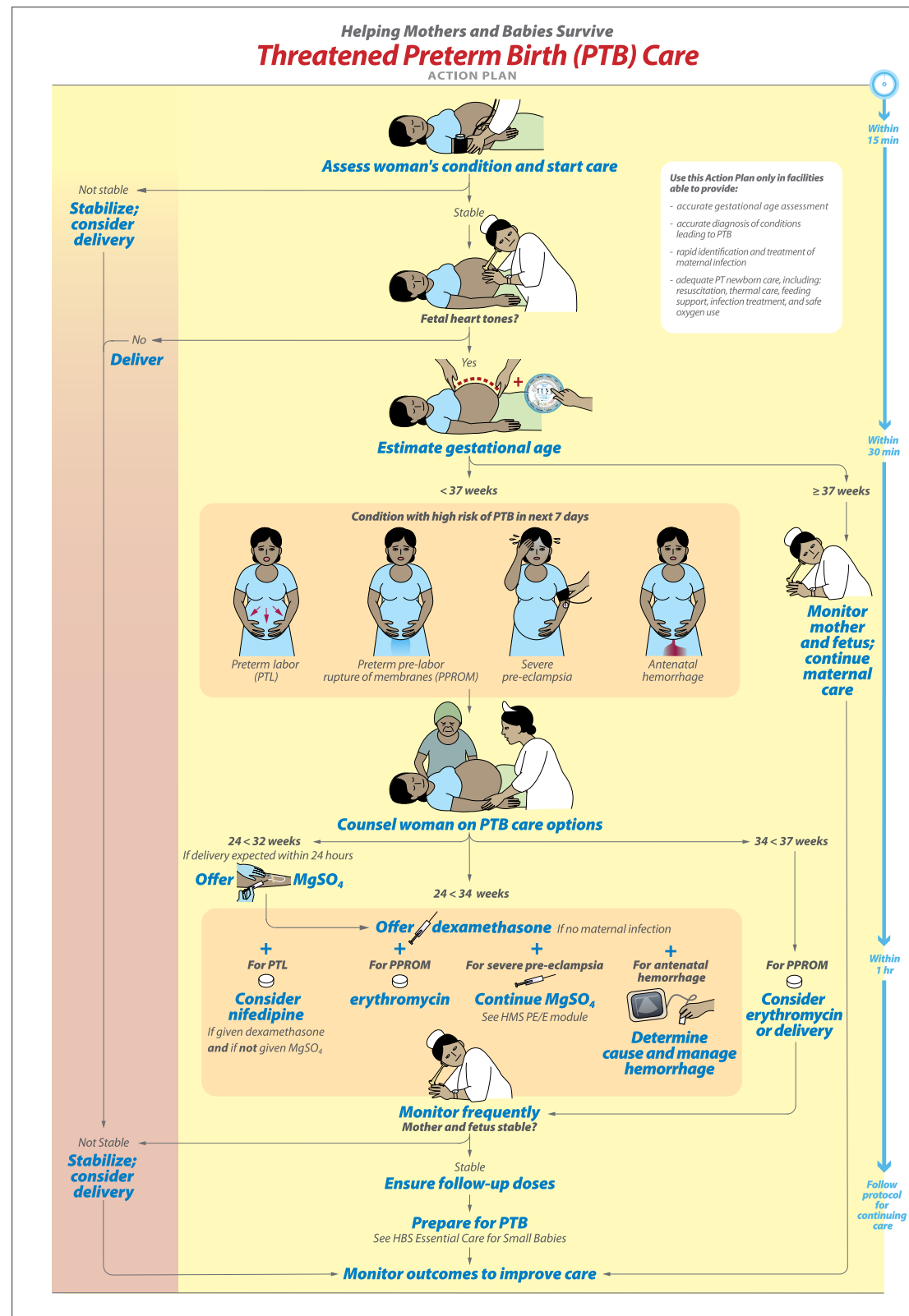
Direct learners to form groups of 4–6. Assign each group a case number. Direct them to the case studies starting on page 43 of the Provider Guide and tell them to finish all questions on one page before moving to the next page. Additional information will be given on each page.

Each group should pick a recorder and a presenter. You may choose to have groups present to the larger group after each section of the case study or all at once at the end. Leave plenty of time for discussion.

Note: Detailed information on each case is given in the Provider Guide. Key points for discussion are included here for your convenience.



Exercise: Mastering the Action Plan



CASE 1	CASE 2	CASE 3	CASE 4
Assess woman's condition and start care	Assess woman's condition and start care	Assess woman's condition and start care	Assess woman's condition and start care
Quick check	Quick check	Quick check	Quick check
Fetal heart tones	Fetal heart tones	Fetal heart tones	Fetal heart tones
Estimate gestational age	Estimate gestational age	Estimate gestational age	Estimate gestational age
Condition leading to birth in the next 7 days	Condition leading to birth in the next 7 days	Condition leading to birth in the next 7 days	Condition leading to birth in the next 7 days
Preterm labor (PTL)	Preterm prelabor rupture of membranes (PPROM)	Severe pre-eclampsia	Antenatal hemorrhage
Counsel woman on PTB care options	Counsel woman on PTB care options	Counsel woman on PTB care options	Counsel woman on PTB care options
Offer dexamethasone	Do not offer dexamethasone	Offer dexamethasone	Offer dexamethasone
Offer MgSO ₄	Do not offer MgSO ₄	Offer MgSO ₄ for PE/E	Offer MgSO ₄ when delivery is expected within 24 hours
Offer nifedipine only if given dexamethasone and not MgSO ₄	Offer erythromycin	Continue MgSO ₄	Determine cause and manage hemorrhage
Monitor frequently	Monitor frequently	Monitor frequently	Monitor frequently
Mother and fetus stable	Mother and fetus stable	Mother and fetus not stable	Mother and fetus stable
Ensure follow-up doses	Ensure follow-up doses	Deliver	Ensure follow-up doses
Prepare for PTB	Prepare for PTB	Prepare for PTB	Prepare for PTB
Monitor outcomes to improve care	Monitor outcomes to improve care	Monitor outcomes to improve care	Monitor outcomes to improve care

Mobilize perinatal team, prepare for PTB and care of small baby

Explain

Preterm birth is not an indication for cesarean delivery:

- Cesarean sections are more dangerous for the mother
- They do not improve outcomes for the newborn
- WHO et al. do not recommend routine cesarean section for preterm infants, regardless of cephalic or breech presentation (2015)

Preterm babies need additional care immediately after birth:

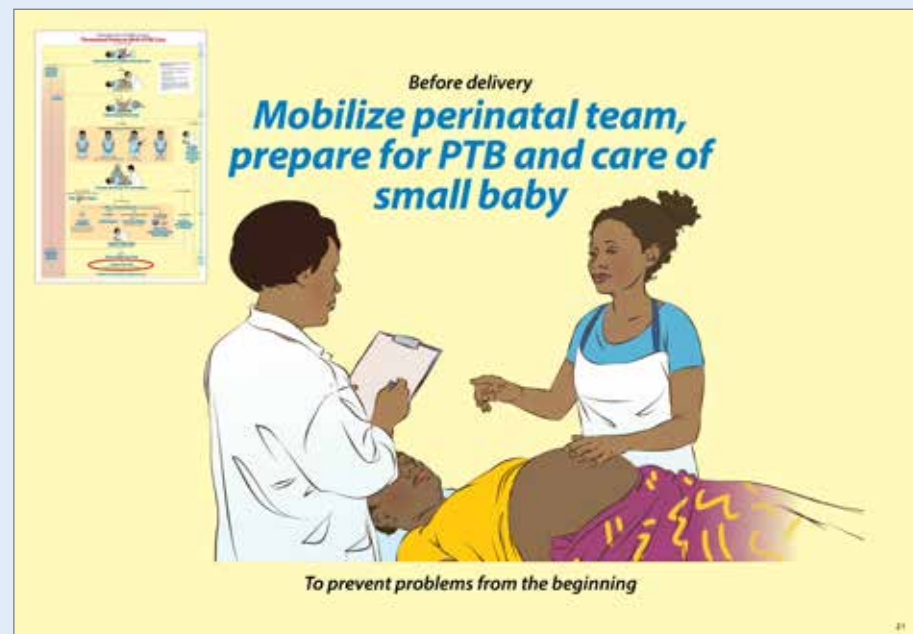
- Make plans to have at least one additional staff member at bedside during birth
- Alert newborn care providers as soon as you identify someone at risk of preterm birth so they can prepare

Anticipate need for and be ready to provide:

- Essential care for a small baby
- Bag and mask resuscitation
- Delayed cord clamping (> 1 minute after birth)
- Ventilation support, if available
- Thermal care (continuous skin-to-skin contact)
- Breastfeeding support
- Increased attention to infection prevention
- Continuous monitoring of newborn
- Information to parents

Invite Discussion

1. What do you currently do to prepare for a preterm birth?
 - Explore current use of cesarean sections
2. What will you do differently now or recommend to your colleagues?
3. How will you know if preparation for PTB and care of small babies is improving?



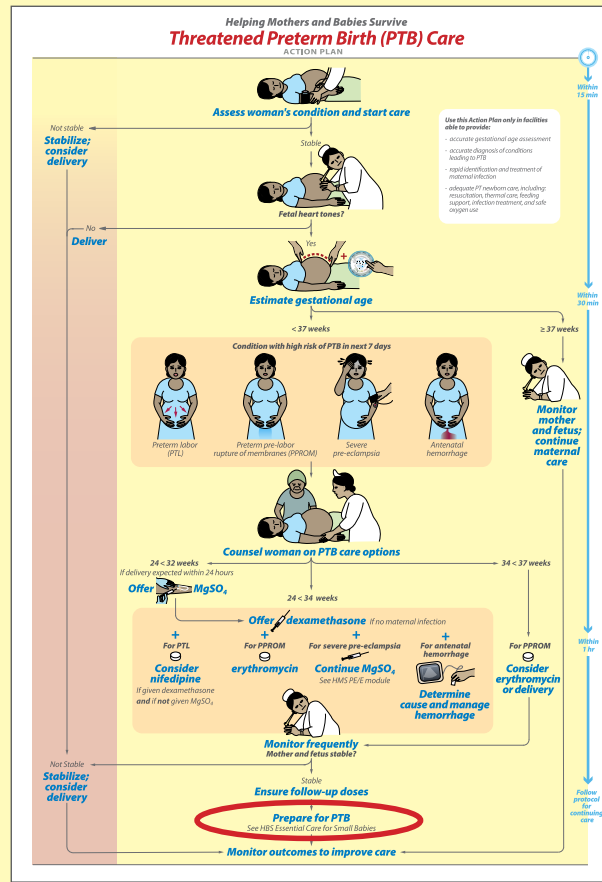
Background

Preterm babies need increased attention after birth to improve their chance of survival. Compared to full-term babies, they get infections more easily and have a harder time breathing, eating, and maintaining their temperature.

Being prepared will help prevent common problems. Increased monitoring of preterm babies will help identify problems early so that they can be corrected before the baby becomes too ill. See *Helping Babies Survive: Essential Care for Every Baby* and *Essential Care for Small Babies* for additional information.

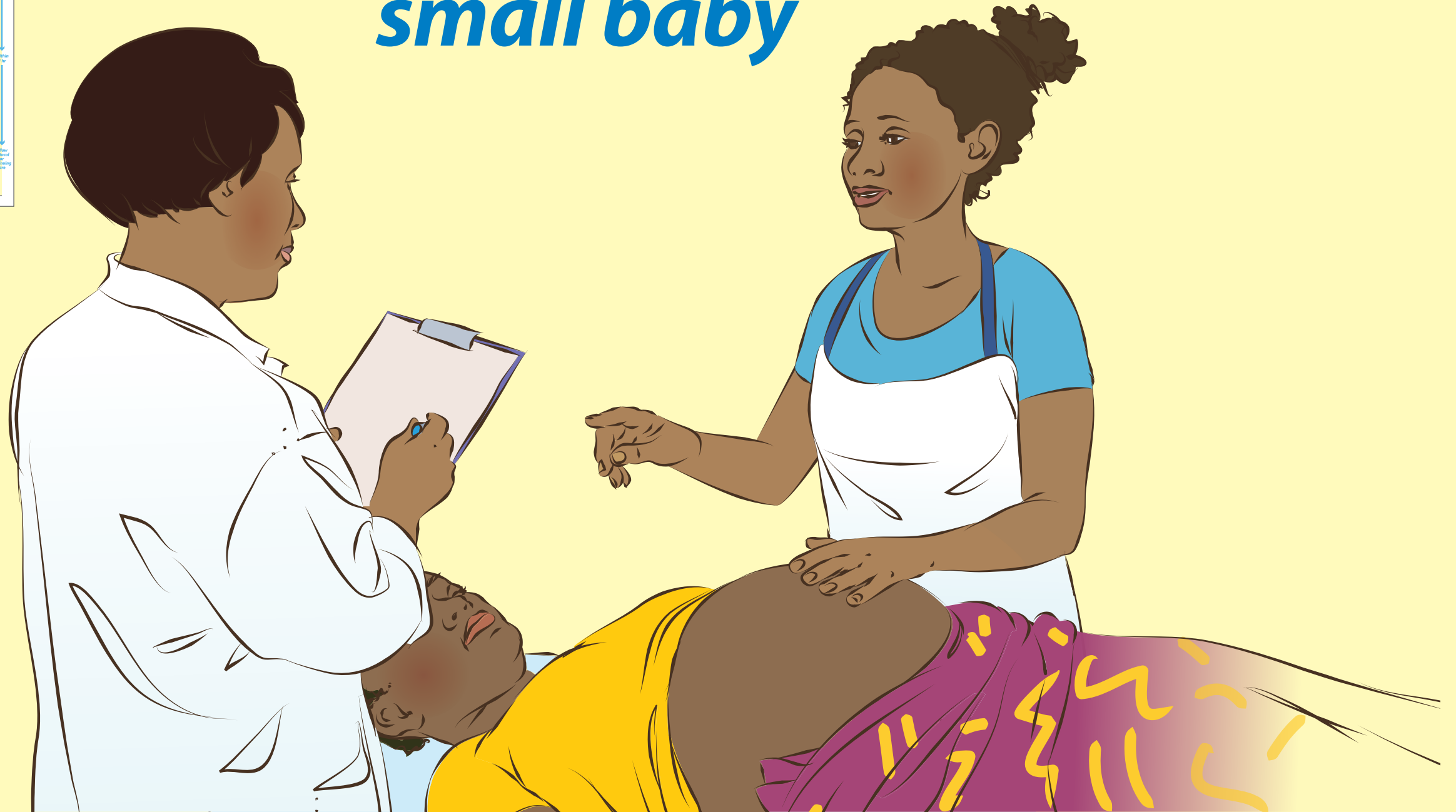
Educational Advice

When discussing preparation for a preterm birth, prompt participants to think about everything that happens postbirth, what is needed, and who is responsible for providing the care or carrying out needed tasks. Are there ways to improve the system by making it more efficient or reliable?



Before delivery

Mobilize perinatal team, prepare for PTB and care of small baby



To prevent problems from the beginning

Measure actions and outcomes

Explain

We only manage what we measure:

- Data are management tools. If we don't measure, we don't know if what we're doing is working or not.
- Data help prioritize actions, so we can focus on the most important problem.
- Data show us where we are doing well!

First, identify data needs (key indicators):

- Identify the goals of high-quality care for mothers with threatened preterm birth.
- What information do you need to manage the quality of that care?

Next, work to improve data availability and quality for key indicators:

- What will make it easy to record and access the data needed?
- Consider adapting logs and registers to collect needed data.

Finally, graph key data for better understanding:

- Turning data into pictures makes it easier to see a story.
- Make simple line or bar charts with one or two indicators per chart. Update with new data weekly or monthly.
- Choose a target for each indicator and draw a line representing it on the graph.
- Post in a public location where all staff can see—everyone needs to work together to maintain and improve quality care.

Invite Discussion

1. How do you use data now?
2. What will you measure to know if you are offering high-quality PTB management? (*Review Suggested Key Indicators in box.*)
3. Are the data that you need available? If not, what can you do?

Demonstrate and Facilitate Practice

Review how to calculate percentages and how to make line and bar charts.

Use flip chart paper, a blackboard, or a whiteboard so that all can see.

In small groups, have participants complete the exercises “Calculating Indicators” and “Creating Graphs” in the Provider Guide, pgs. 52–53.

Answers:

$$170/205 = 83\%$$

$$16/24 = 67\%$$

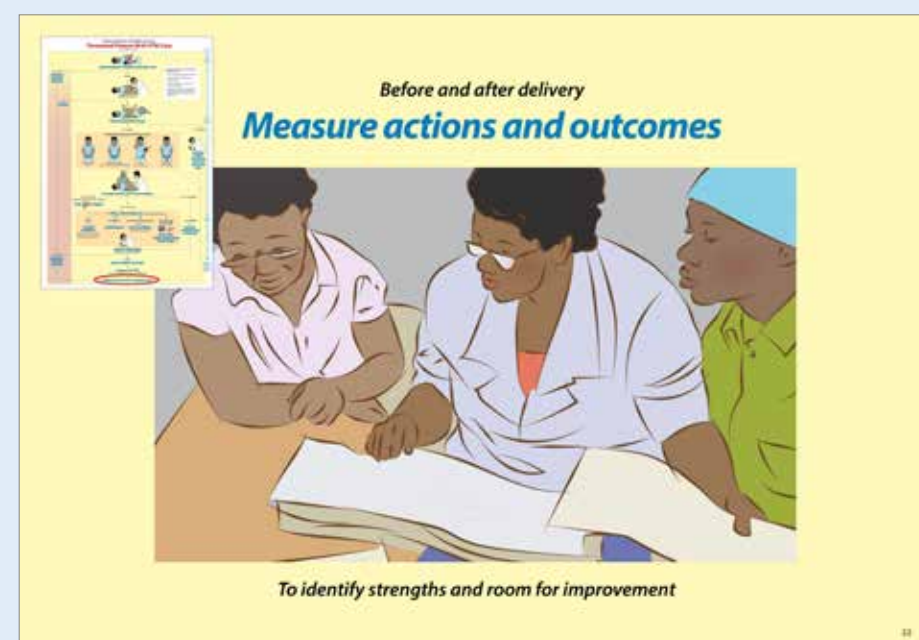
$$5/21 = 24\%$$

$$3/8 = 38\%$$

$$8/10 = 80\%$$

$$11/205 = 5\%$$

Discuss results. Ask participants to compare looking at the data in a table versus on a graph (pg 53). What story or stories do they see on the graph?



Background

Tracking correct administration: Tracking performance is an important part of quality improvement. It can help identify barriers to good practice and potential solutions. To measure and manage PTB care, check that:

- The women who need the interventions are getting them in a timely manner (quick and accurate assessment)
- The women who are getting the interventions need them (accurate diagnosis)
- The interventions are being delivered according to protocol: right time, right dose, right route
- Infection protection measures are being followed

Suggested Key Indicators

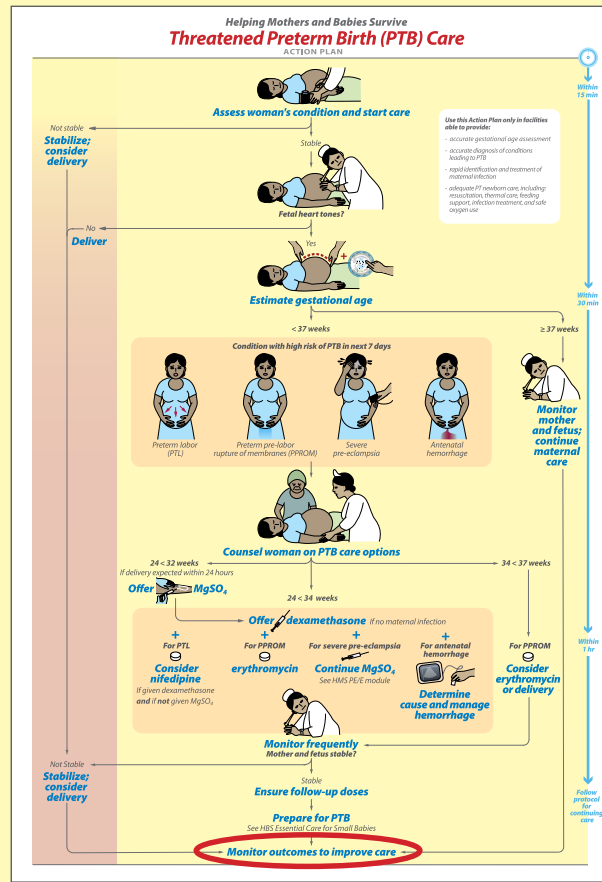
- % of all births that had GA documented prior to delivery
- % of babies delivered with known GA > 24 and < 34 weeks exposed to antenatal corticosteroid prior to birth

- % of babies exposed to antenatal corticosteroid at any time during gestation and born ≥ 34 weeks GA
- % of babies delivered at < 32 weeks of gestation exposed in utero to magnesium sulfate for fetal neuroprotection
- % of women with PPROM who received prophylactic antibiotics
- % of facility births that end with a neonatal death before discharge

If your country has specific data requirements, share them with learners now.

Educational Advice

If possible, use a flip chart or whiteboard to capture key points from the discussion questions.



Before and after delivery

Measure actions and outcomes



To identify strengths and room for improvement

Use the information and take action

Explain

Improving the care of mothers and babies is a continuous process. Apply your knowledge and skills, work as a team to identify problems, develop and test solutions, and measure change.

Review the Provider Guide to begin the process of improvement:

- Reflect on what you have learned, what you will do differently, and what you will no longer do.
- Identify the the goals of high-quality care for mothers with threatened preterm birth.

Form an improvement team and decide what your team would change:

- Identify team members.
- Discuss concerns about the key parts of care and the problems mothers and babies have.
- Study the actual information (data for chosen outcome) routinely collected in the facility.
- Identify the outcome you want to change.

- Identify practices that need improvement (see “What to monitor” on each page of the Provider Guide).

Implement change:

- Decide how you will make the change.
- Determine what additional data, if any, will be needed to demonstrate improvement and how and when you will collect them.
- Discuss what resources will be needed to make the change.
- Plan who will look at the data and analyze them.
- Suggest how to share the results of a change with all providers.
- Plan how to maintain change when it occurs and what to do if it does not occur.

Invite Discussion

- What is the value of information that you and other providers record about patients?
- What roles can a provider play in making change?
- What resources may be needed to create a change?

Demonstrate and Facilitate Practice

As a large group, discuss what steps learners would take to improve the number of women between 24 and 34 weeks GA with severe pre-eclampsia who are offered dexamethasone. Take notes where everyone can see.

Suggested steps:

- Organize a team.
- Collect and examine data on eligible women and dexamethasone use.
- Decide why eligible women may not get dexamethasone.
- Decide the change the team would make to ensure they do.
- Describe how to make the change.
- Describe what data are needed to show whether the change is effective.
- Suggest what can be done if the change is not working.

After you collect data
Use the information and take action



To improve care

Background

The value of data routinely recorded about patients is that such data can show what aspects of care need improvement and demonstrate the effect of change. Improvement teams are more successful in making change than individuals, but every provider has a responsibility to help improve the quality of care. A champion or leader can help organize the team to implement change.

Educational Advice

If the facility is already using dexamethasone, ask providers to bring a copy of the actual data they collect. Rather than only discussing the steps, go through each step using information from the facility. This exercise can be used to start the improvement process during follow-up visits or mentoring sessions as well.

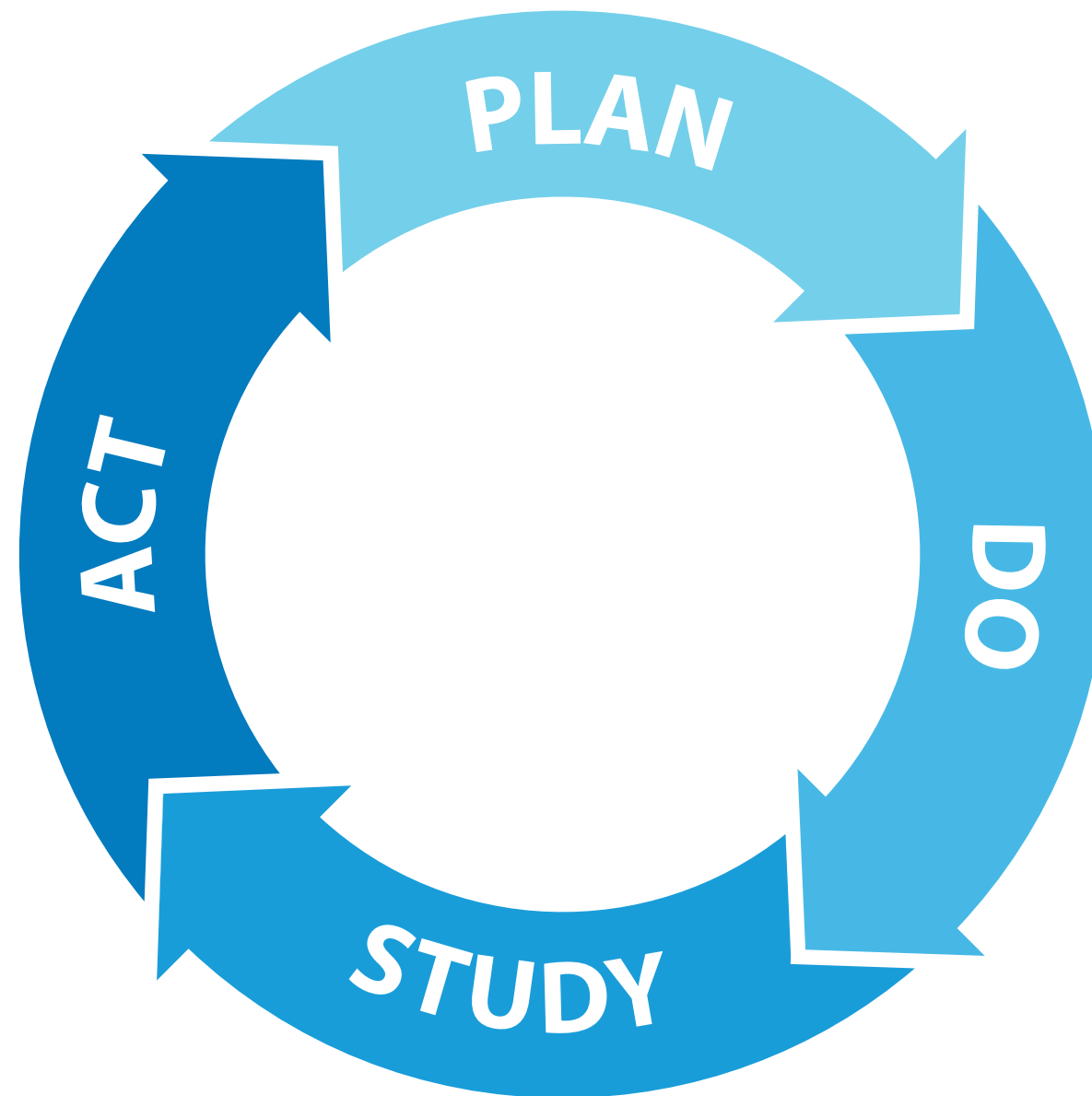
Tools for improvement of care may be available through the regional health system.

Materials for practice:

- Dataset of women < 34 weeks GA with PE/E, including who did and did not receive dexamethasone
- Paper
- Pen

After you collect data

Use the information and take action



To improve care

Use the Provider Guide

Explain

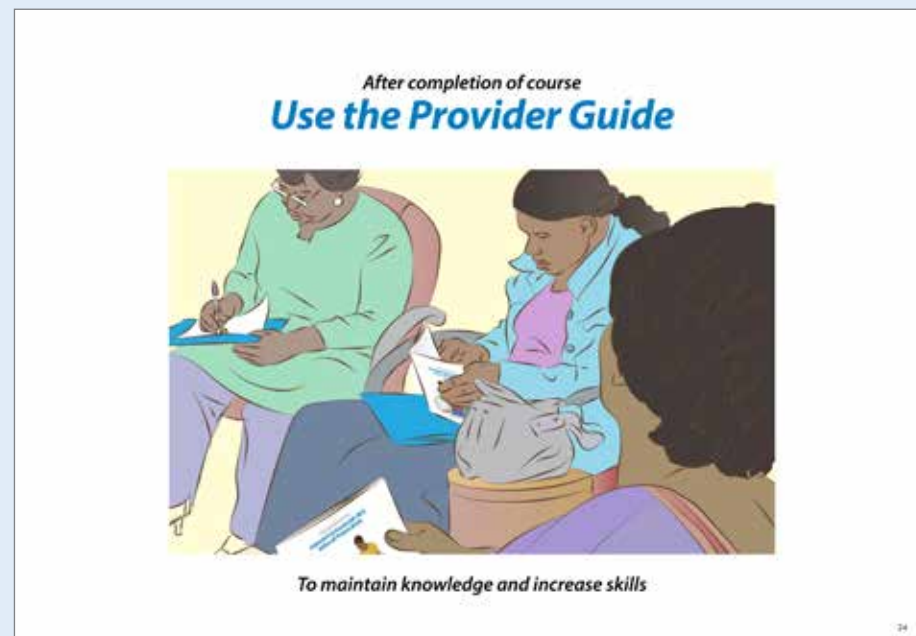
Use the Provider Guide to maintain knowledge and skills to provide essential care. Work with a partner who has also completed the course.

For each topic:

- Review the "Review Key Knowledge" section.
- Practice key skills as outlined.
- Discuss similarities and differences with how this element of care is performed in your facility.
- Consider improvements in equipment, supplies, and protocols that might improve your ability to offer quality care.

Invite Discussion

1. Can you identify a partner for the activities outlined in the Provider Guide?
2. How can you arrange time to perform the activities in the Provider Guide?
3. What strategies will you use to improve protocols and other routines of care?
4. With whom would you discuss improvements in the availability of resources?



Background

The Provider Guide will be used by some facilitators to help learners prepare for the Threatened Preterm Birth Care course. When the Provider Guide is used in this manner, learners will be asked to read the Review Key Knowledge sections.

The ability to provide preterm birth management requires knowledge and skill, and these will diminish over time if not refreshed and practiced. Practice and relearning increase this ability. After the completion of this course, the next step is to participate in activities that will help learners maintain and increase their ability to provide preterm birth management by periodically reviewing knowledge and practicing key skills. These activities are outlined in the Provider Guide.

The activities in the Provider Guide review the actions required for preterm birth management, the actions that were learned in the course. The Provider Guide also includes a section on each page which encourages a discussion of how to improve the delivery of preterm birth management actions to every woman who needs them.

Educational Advice

- Distribute a Provider Guide to each learner if this was not done prior to the course.
- Explain and demonstrate the organization of the Provider Guide.
- Demonstrate use of the Provider Guide by discussing the completion of one exercise as an example.

After completion of course
Use the Provider Guide



To maintain knowledge and increase skills

Gestational Age Role-Play

Provider:

Mrs. Banda, you appear to be in labor. It is important to know how old your baby is so we can help him if he's too young. When were you expecting your baby to come?

Mother:

Not for at least 2 more months.

Provider:

Did you have an ultrasound during the first 3 months of pregnancy for dating?

Mother:

I don't think so.

Provider:

Do you remember the date of the first day of the last time you had your monthly bleeding?

Mother:

No, but I remember it was close to the beginning of the rainy season because my laundry got rained on.

Provider:

OK, that helps. Do you remember anything else? Anything happening in your village or in the news?

Mother:

Oh, yes! It was the week of the provincial elections.

Provider:

Great, I'm going to use this wheel to estimate the number of weeks you've been pregnant.

By this calculation you are 31 weeks pregnant, just what you thought.

Now I'm going to measure the size of your baby. Let me help you lie down flat. I'm measuring from your symphysis pubis, the hard bone right here, straight up your belly to the top of your fundus (womb). To get the right measurement I put the tape measure number side down, under my hand, and feel with the edge of my hand.

Starting at 20 weeks, this measurement in cm should roughly match the number of weeks you are pregnant. I'm getting 35 cm.

Since that's more than 3 weeks' difference, I would like to do an ultrasound. Ultrasounds late in pregnancy aren't as accurate for dating as those early in pregnancy but I also want to make sure there's only one baby in there! Is that OK?

Mother:

Yes, please, I hope there's only one!

Provider:

I am very confident that your baby is less than 34 weeks. Because he is so young, there are some things we can do now, before he is born, to help him have fewer complications.

Background

Change words, phrases, and dates to fit the local context. Role-play with a co-facilitator or ask for a volunteer to be the mother ahead of time. Give the volunteer time to read over the script or practice. Hand out gestational wheels before the demonstration so that learners can follow along. You may also want to ask learners to follow along on the GA algorithm and/or have another facilitator point to the steps as the role-play progresses. After the role-play, discuss any questions and review.

Threatened Preterm Birth Knowledge Check

Select the best answer to each question or statement.
Circle the letter of the correct answer.

1. Which people should be on a perinatal team?

- a. Providers caring for mothers before and after birth
- b. All those involved in care of mothers or babies including providers, facility administrators, and pharmacy personnel
- c. Providers caring for babies immediately after birth
- d. Providers involved in care of mothers or babies before or after birth

2. How quickly should women be assessed after arrival at your facility? Within:

- a. 5 min
- b. 15 min
- c. 30 min
- d. 45 min

3. When can you have high confidence in a gestational age estimation?

- a. There are results from a first trimester ultrasound, the mother is sure of her exact LMP, or more than one method was used to calculate gestational age and they agree within 3 weeks
- b. There are results from a first trimester ultrasound, the mother is sure of her exact LMP, or the mother remembers when the baby first moved (quickening)
- c. The mother is sure of her exact LMP or the mother remembers when the baby first moved (quickening)
- d. Three methods were used to calculate gestational age and they agree within 4 weeks

4. Dexamethasone, an antenatal corticosteroid, is recommended for women with threatened preterm birth because it:

- a. Lowers the mother's BP
- b. Delays labor
- c. Matures the fetal lungs
- d. Decreases the risk of cerebral palsy

5. Only offer antenatal corticosteroids when you have high confidence that the gestational age is:

- a. < 32 weeks
- b. < 34 weeks
- c. < 35 weeks
- d. < 37 weeks

6. In addition to high confidence in gestational age estimation, what criteria need to be met before offering dexamethasone? The ability to:

- a. Treat maternal infections, manage postpartum hemorrhage, and provide standard newborn care
- b. Treat maternal infections, diagnose conditions leading to preterm birth, and provide advanced care for preterm newborns
- c. Diagnose conditions leading to preterm birth, determine whether twins are present, and provide standard newborn care

7. What is an acceptable dose, route, and timing of dexamethasone when using it as an antenatal corticosteroid?

- a. 12 mg IM every 12 hours, two times
- b. 12 mg IM every 12 hours until delivery
- c. 12 mg oral every 24 hours until delivery
- d. 24 mg IM in a single dose

8. Dexamethasone may increase the risk of:

- a. Maternal sepsis and neonatal mortality in older infants
- b. Maternal sepsis and newborn jaundice
- c. Postpartum hemorrhage and newborn jaundice
- d. Postpartum hemorrhage and neonatal mortality in older infants

9. Dexamethasone should be offered to which of the following women?

- a. A woman carrying twins with a history of preterm birth who comes in for a regular antenatal visit at 32 weeks
- b. A woman in preterm labor at 31 weeks with a fever of 39°C and uterine tenderness
- c. A woman with pregestational diabetes and BP of 165/115 at 33 weeks
- d. All of the above

10. Repeat courses of dexamethasone should be offered:

- a. Never
- b. Every 7 days until delivery as long as the risk for preterm birth remains
- c. Once, 7 days after the first course if GA is < 34 weeks and an assessment finds a high risk of birth in the next 7 days

11. Magnesium sulfate is recommended for women with threatened preterm birth because it:

- a. Lowers the mother's BP
- b. Delays labor
- c. Matures the fetal lungs
- d. Decreases the risk of cerebral palsy

12. Offer magnesium sulfate to women with a high risk of preterm birth in the next 24 hours and gestational age:

- a. < 32 weeks
- b. < 34 weeks
- c. < 35 weeks
- d. < 37 weeks

13. What is the correct loading dose for MgSO₄?

- a. 4 g IV loading dose using 20% solution, immediately followed by 10 g IM using 50% solution
- b. 4 g IV loading dose using 50% solution, immediately followed by 10 g IM using 20% solution
- c. 4 g IV loading dose using 50% solution, immediately followed by 10 g IM using 50% solution

14. Respiratory or cardiac arrest from magnesium toxicity is:

- a. Impossible
- b. Very rare
- c. Common

15. To prevent magnesium toxicity, monitor hourly. Stop or delay maintenance dose if:

- a. Patellar reflex is absent, respirations < 16 per minute, or urine output < 30 mL/hr over the past 4 hours
- b. Patellar reflex is weak, respirations < 20 per minute, or urine output < 60 mL/hr over the past 4 hours
- c. Patient reports headache and/or nausea
- d. Patient reports a feeling of warmth throughout the body or there is any decrease in fetal heart rate

16. Magnesium sulfate should be offered to which of the following women? All are 31 weeks gestational age.

- a. A woman with confirmed ruptured membranes who is not contracting
- b. A woman with heavy bleeding who you expect to have a cesarean section in the next few hours
- c. A woman who is 1 cm dilated and lightly contracting every 10 minutes

17. Nifedipine should be stopped 48 hours after the first dose of dexamethasone was given even if contractions continue.

- a. True
- b. False

18. Which of the following women is in preterm labor?

- a. A woman 36 weeks GA with painful contractions every 3 minutes who is 4 cm dilated and 10% effaced
- b. A woman 29 weeks GA with cramping and pelvic pressure who was 1 cm dilated 2 hours ago and is now 3 cm dilated
- c. A woman 32 weeks GA contracting every 3 minutes with ruptured membranes and unknown cervical dilation
- d. All of the above

19. Nifedipine can be offered to which of the following women in preterm labor? All women are 31 weeks gestational age.

- a. A woman who has not received any other medication
- b. A woman who has been given dexamethasone
- c. A woman who has been given dexamethasone and magnesium sulfate
- d. All of the above

20. Who should be offered erythromycin prophylaxis?

- a. Only women with preterm prelabor rupture of membranes
- b. All women in preterm labor
- c. All women at risk of preterm birth

21. For prophylaxis (to prevent infection and infection-related problems), erythromycin should be given:

- a. 250 mg four times per day for 7 days
- b. 500 mg four times per day for 7 days
- c. 250 mg four times per day for 10 days
- d. 500 mg four times per day for 10 days

22. Women with preterm prelabor rupture of membranes (PPROM) should be delivered:

- a. Immediately
- b. Within 5 days of rupture
- c. When the risk of infection outweighs the risk of preterm birth (no later than 37 weeks)

23. You want to diagnose preterm prelabor rupture of membranes (PPROM). What is NOT part of your plan?

- a. Check for typical odor of amniotic fluid
- b. Digital vaginal exam
- c. Visual inspection with high-level disinfected speculum
- d. Ask about a sudden gush of fluid and/or continued leaking

24. A woman has severe pre-eclampsia and is on MgSO₄. She received her first shot of dexamethasone, 12 mg IM, 2 hours ago. Over the last hour, her BP has risen and she is now complaining of epigastric pain. These are signs that her pre-eclampsia is worsening. What should you do?

- a. Continue assessing her and plan delivery once she has received the second dose of dexamethasone
- b. Give her the second shot of dexamethasone now and immediately start moving toward delivery
- c. Immediately start moving toward delivery; she should be delivered within 12 hours and won't receive a second dose of dexamethasone

25. Preterm babies should be routinely delivered

- a. By cesarean section (all)
- b. Vaginally unless otherwise indicated

Advice for Course Facilitators

1. Assemble the course materials

Assemble all educational materials, equipment, and supplies to facilitate practice and exercises.

Have enough Flip Charts, Action Plans, GA Job Aids, and Medication Charts so that they can be easily seen by all participants. Each participant will need a Provider Guide and recording sheet for the Knowledge Check (multiple choice question exam). Refer to the "Master Equipment List" on this page for additional supplies.

2. Prepare yourself

Review the five sections of the Flip Chart pages:

- Explain—Key points that you will explain to the learner.
- Invite Discussion—Questions that will provoke discussion among the participants about the local context of care. These questions will also help participants identify changes to improve care.
- Demonstrate and Facilitate Practice—Guidance about how learners should practice skills required for each action.
- Background—A brief summary of details about the action which will help you answer questions.
- Educational Advice—Advice that will assist you in creating the ideal learning experience. Decide in advance which learning activities you will include and familiarize yourself with national and facility guidelines related to each topic.

Familiarize yourself with exercises and evaluations in the Flip Chart:

- Exercises provide targeted practice for especially important or complex parts of the Action Plan. Facilitator directions are included with each exercise.
- The Knowledge Check can be given as both a pre- and postcourse evaluation.

Review the four sections of the Provider Guide pages:

- Review Key Knowledge—A summary of important facts.
- Practice and Plan to Improve Care—Exercises to guide both skills practice and improvement in the system of care.
- To improve care in your facility—Questions to stimulate ideas for change and improvement, key actions to improve care, and additional resources to consult.
- What to monitor—Some key indicators that can be used for data collection as part of efforts to improve quality of care.

Familiarize yourself with protocols, guidelines, and common practices nationally or in the facility that differ from those recommended in this program:

- These might include:
 - How gestational age (GA) is determined

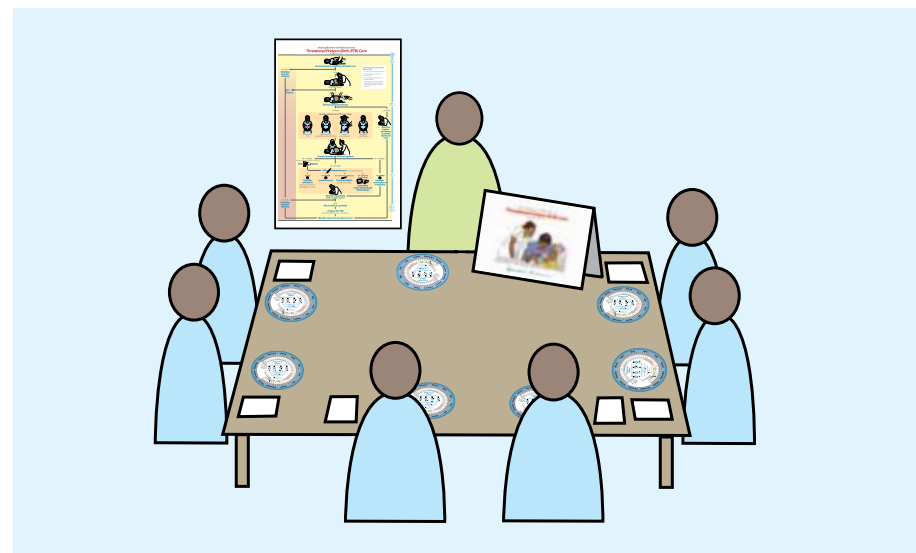
- Which parts of threatened preterm birth care are offered and eligibility criteria for each intervention
- Specific drugs and dosing regimens used
- The decision to teach something that differs from recommendations in this program should be agreed upon in advance with the course director in consultation with the health authority.

3. Prepare the learners (optional)

The learners can be given the Provider Guide in advance of the course and asked to read the Review Key Knowledge material in each section.

4. Prepare the space for learning

Arrange the classroom space so that all learners can view a poster-sized Action Plan and easily see a Flip Chart. If possible, arrange seating in a circle. Refer back to the Action Plan often. Show where you are on the Action Plan at the start of each Flip Chart page.



5. Engage the learners

Encourage learners to participate actively and share their experiences. Most classroom time should be spent on practice and group discussion. Help learners practice correct technique. Ask them to reflect on their own performance first. Provide positive feedback and then offer constructive suggestions for improvement. Be respectful and positive when correcting mistakes. Ask them what they have learned and what they would change in their practice.

6. Evaluate knowledge

Describe to learners how they will be evaluated.

At the end of the course, ask each learner to complete the Knowledge Check. Each learner should answer at least 80% of questions correctly.

Master Equipment List

Visible to each participant:

- Threatened Preterm Birth Care Action Plan
- Gestational Age Job Aid
- Flip Chart

For each participant:

- Provider Guide
- Pen and paper
- Two copies of Knowledge Check (pre- and postcourse)
- Pregnancy calculator, such as a gestational age wheel

For every four participants:

- Pregnant patients or simulators and fundal height tape measures
- Clean gloves
- MgSO₄ 20% and 50%
- Lignocaine 2%
- Calcium gluconate 10%
- Sterile water
- 20 mL syringe with IM needle
- Supplies for starting an IV line
- Spirits/rubbing alcohol (can simulate with water) and cotton balls
- Model to simulate starting an IV and giving deep IM injections (a melon or pumpkin can be used for IM injections)
- Safe needle disposal system
- MgSO₄ monitoring sheet (in Provider Guide)
- Reflex hammer
- Simulated handwashing site (can draw sink on blackboard or piece of paper)

Other

- Blank flip chart paper and stand; different colored markers
- Prepared flip chart pages: welcome; expectations and norms; counseling checklist
- Tape or putty to hang posters
- Masking tape or a piece of string 3 meters long to lie on the floor
- Charting examples from participants' facility
- Thermometer and blood pressure cuff (for quick check demonstration)

Knowledge Check: Answer Key

1. b; 2. b; 3. a; 4. c; 5. b; 6. b; 7. a; 8. a; 9. c; 10. c; 11. d; 12. a; 13. a; 14. b; 15. a; 16. b; 17. a; 18. d; 19. b; 20. a; 21. c; 22. c; 23. b; 24. c; 25. b

REFERENCE LIST

Althabe F, Belizán JM, Buekens P, McClure EM, Koso-thomas M, NICHD's Global Network for Women's and Children's Health Research ACT Trial Steering Committee. 2014. Antenatal corticosteroids to reduce preterm deaths in low-income settings. *Lancet Glob Health*. 2(8):e444. doi: 10.1016/S2214-109X(14)70261-X.

Roberts D, Dalziel SR. 2006. Antenatal corticosteroids for accelerating fetal lung maturation for women at risk of preterm birth. *Cochrane Database Syst Rev*. 19;(3):CD004454. doi: 10.1002/14651858.CD004454.pub2.

WHO, United Nations Population Fund, UNICEF, The World Bank. 2015. *Pregnancy, Childbirth, Postpartum and Newborn Care: A Guide for Essential Practice*. 3rd ed. http://www.who.int/maternal_child_adolescent/documents/imca-essential-practice-guide/en/.

WHO, Department of Reproductive Health and Research. 2007. *Managing Complications in Pregnancy and Childbirth: A Guide for Midwives and Doctors*. Geneva, Switzerland: WHO. http://apps.who.int/iris/bitstream/10665/43972/1/9241545879_eng.pdf.

WHO. 2015. *WHO recommendations on interventions to improve preterm birth outcomes*. Geneva, Switzerland: WHO. http://apps.who.int/iris/bitstream/10665/183037/1/9789241508988_eng.pdf

Related Training Modules

Helping Mothers Survive Pre-eclampsia & Eclampsia. Jhpiego. 2016. www.helpingmotherssurvive.org

Helping Babies Survive: Essential Care for Small Babies. American Academy of Pediatrics. 2015. <http://internationalresources.aap.org/Resource/Home>

Threatened Preterm Birth Care

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The *Threatened Preterm Birth Care* module is the first to be included under both the *Helping Babies Survive* and *Helping Mothers Survive* series. This reflects the need to care for mother and baby in tandem as a dyad to achieve optimal results. The module was created in response to the growing interest, support, and ability to reduce deaths related to prematurity by taking action before birth when a preterm delivery is expected. Content is based on the 2015 WHO Recommendations on Interventions to Improve Preterm Birth Outcomes.

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