Malpresentations, Malpositions, and Multiple Gestation

Learning Objectives
1. List complications associated with various malpresentations.
2. Discuss delivery management of multiple gestation.
3. List the steps to safely perform a breech delivery utilizing the CAREFUL mnemonic.

Definitions
Definitions are important to a discussion of malpresentations. Lie is the relationship of the long axis of the fetus to that of the woman, specified as longitudinal, transverse, or oblique (also called unstable). Presentation is the portion of the fetus that is foremost, or presenting, in the birth canal. The fetus may present by vertex, breech, face, brow, or shoulder. Position is a reference point on the presenting part and how it relates to the woman’s pelvis. For example, the reference point on the vertex is the occiput. When the fetal occiput is directed toward the woman’s symphysis, or anteriorly, the fetus is in occiput anterior (OA) position. When the occiput is directed toward the maternal spine, the fetus is in occiput posterior (OP) position. Intermediate positions around the compass are left occiput anterior (LOA) and right occiput anterior (ROA), left occiput transverse (LOT) and right occiput transverse (ROT), and left occiput posterior (LOP) and right occiput posterior (ROP). In breech presentation, the reference point is the sacrum and the desired position during delivery is sacrum anterior.

Methods of Diagnosis
There are three principal methods of determining fetal lie, presentation, and position: (1) Leopold maneuvers, or abdominal palpation, (2) vaginal examination, and (3) imaging with ultrasound. Ultrasound examination is performed in the labor department and is commonly used in hospitals of all sizes. All maternity care clinicians should have ultrasound skills to determine fetal lie, presentation, and position. Handheld ultrasound devices are available.

Vaginal Examination
In vertex presentation, the scalp (sometimes with hair) can be felt, and the sagittal suture, the Y-shaped posterior fontanel, and the larger diamond-shaped anterior fontanel can be palpated. Following the sagittal suture to determine the location of the posterior fontanel allows determination of OA and OP position.

In breech presentation, the buttocks (smooth skin, no hair) can be felt, and an orifice (meconium may be present on the glove if a finger is introduced into the orifice), and/or the ischial tuberosities (in a line with the anus) also may be felt.

In face presentation, the face can be felt (smooth skin, no hair). An orifice may be felt (introducing a finger into the mouth may elicit a sucking response from the fetus), and/or the malar prominences, which form a triangle with the mouth. The fetus in this presentation may deliver vaginally if the mentum (chin) is anterior, allowing flexion of the head around the symphysis pubis. The fetus with the mentum located posteriorly cannot be delivered vaginally unless spontaneous rotation to the anterior occurs, because the fetal head will not flex but rather must extend. A cesarean delivery will be required.

In brow presentation, the anterior fontanel, orbital ridges, eyes, and the base of the nose can be felt. This presentation is unstable and will typically convert to a face or vertex presentation. This can be a difficult presentation to detect by examination.

In a transverse lie, the pelvis will be empty on vaginal examination, and the diagnosis is typically made easily by palpation or ultrasound examination.

In a cord prolapse or other fetal part malpresentation (eg, arm), the diagnosis is typically made by visual inspection or palpation on immediate vaginal examination.

The incidence of malpresentations and malpositions at term are listed in Table 1.
Malpresentations, Malpositions, and Multiple Gestation

The Fetal Head and the Maternal Pelvis

Most fetal malpresentations (ie, OP, breech, transverse, face, brow) are clinically significant because the fetal head is not round, but rather ovoid (ie, egg-shaped). The smallest of the fetal diameters is the suboccipitobregmatic; the largest is the occipitomental (Figure 1). The difference between them is 3 cm on average, or approximately 24%.1 When the head is in full flexion, the suboccipitobregmatic diameter presents to the pelvis. When the head is in full extension (or deflexion), the occipitomental diameter presents. Delivery is more likely to occur and be easier if a smaller diameter presents. Therefore, the attitude of the fetal head (flexion versus extension) as it presents to the pelvis is of paramount importance. A degree of fetal extension of the head occurs with OP, face, and brow presentations.2

Asynclitism also affects the mechanics of labor. Asynclitism is lateral flexion of the head that causes the sagittal suture not to be in the middle of the birth canal. Some degree of asynclitism is normal, and the fetal head may even shift back and forth from anterior to posterior asynclitism as it moves further into the pelvis. Extreme degrees of asynclitism may prevent labor from progressing. Asynclitism becomes a factor in achieving correct application of instruments for assisted vaginal delivery (eg, forceps, vacuum devices).

The maternal pelvis type also affects the cause of various malpresentations and prognosis for delivery. There are four pure types of pelvises (Figure 2):

- Gynecoid (round)
- Anthropoid (oval with the long axis in the anteroposterior [AP] plane)
- Platypelloid (oval with the long axis in the transverse plane)
- Android (triangular or heart-shaped with the apex of the triangle anteriorly)

Most women have a gynecoid pelvis. A narrow pelvis, such as the anthropoid, can cause persistent OP position; the platypelloid pelvis can cause a transverse arrest; the android pelvis is prejudicial to delivery with all malpresentations; and an inadequate or small pelvis can be associated with most of the malpresentations secondary to the inability of the head to descend, engage, or rotate.3

Occiput Posterior Position

In OP position, the fetus lies with the occiput toward the woman’s spine and the face toward the woman’s symphysis and abdomen. The fetus is face up when the woman is supine or in lithotomy position. Typically, a fetus in OP position will rotate spontaneously to OA position and deliver spontaneously. Spontaneous rotation fails to occur in 5% to 12% of cases, and the fetus remains in persistent OP position.4 The exact cause of persistent OP positioning is unknown, but transverse narrowing of the pelvis has an effect. All fetuses in OP position are somewhat deflexed because the vertex drops back to fill the hollow of the sacrum. The combination of deflexion and posterior presentation causes less favorable diameters of the fetal head to present to the pelvis than when the fetus is in OA position.4

---

Table 1. Incidence of Malpresentations and Malpositions at Term

<table>
<thead>
<tr>
<th>Malpresentation</th>
<th>Incidence</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occiput posterior (persistent)</td>
<td>1 in 8 to 20</td>
<td>5 to 12</td>
</tr>
<tr>
<td>Breech</td>
<td>1 in 25 to 33</td>
<td>3 to 4</td>
</tr>
<tr>
<td>Transverse lie or shoulder</td>
<td>1 in 300 to 400</td>
<td>0.33 to 0.25</td>
</tr>
<tr>
<td>Face</td>
<td>1 in 500 to 600</td>
<td>0.2 to 0.3</td>
</tr>
<tr>
<td>Brow</td>
<td>1 in 1,400</td>
<td>0.07</td>
</tr>
</tbody>
</table>

The diagnosis of OP position is based on observation and examination of the patient. Back pain, or back labor, is a clinical hallmark of OP position. Easy palpation of the anterior fontanel on vaginal examination is a diagnostic aid in determining OP position because the anterior fontanel is most easily felt when the head is partially deflexed. If the anterior fontanel is palpated, the sagittal suture must be identified. This can be accomplished by following each suture with the examining finger until the posterior fontanel is felt. Occasionally, an ear can be palpated, revealing the fetal position. The examination findings can be confusing because of molding, overriding of sutures, edema, and asynclitism. Dilation is often asymmetric, and a persistent anterior lip is common. Ultrasound imaging can be helpful but occasionally confusing. Abdominal, transvaginal, and transperineal ultrasound can be used depending on the station of the fetal head and sonographer experience.

In addition to determining OP versus OA position, ultrasound can identify a deflexed head by noting the distance from the chin to the chest. Unfortunately, a deflexed OP position with deep engagement presents difficulty with manual rotation, vaginal delivery, and even cesarean delivery where a reverse breech extraction may be the safest delivery technique.

Diagnosing OP position can be difficult. Maternity care clinicians often make a last-minute diagnosis when the fetal head seems to fill the posterior pelvis as it delivers, or even later as the fetal face becomes visible under the symphysis. Even skilled clinicians occasionally rotate fetuses the wrong direction, from OA to OP position.

Labor and delivery with a fetus in persistent OP position is not markedly different from the delivery of a fetus in OA position. The progress of labor can be monitored by cervical dilation and the descent of the vertex through the birth canal. Labor with a fetus in OP position is often prolonged, and there is an increased incidence of assisted vaginal delivery, cesarean delivery, and anal sphincter lacerations. Perinatal mortality in OP position does not differ significantly from OA position, and there is no significant difference in Apgar scores except in fetuses requiring assisted vaginal delivery. Bruising of the fetal face can occur. Perineal lacerations and extensions of episiotomies may be increased because the vertex sweeps through the posterior pelvis, larger diameters are presented to the pelvic outlet, and the occiput places maximal pressure on the perineum as it delivers. The five possibilities for vaginal delivery when persistent OP position occurs are spontaneous delivery, manual rotation, vacuum delivery, forceps delivery, and forceps rotation.

**Spontaneous Delivery**

Spontaneous delivery using expectant management occurred in 45% of deliveries in one study. Because the fetal head cannot stem upward until the face has cleared the symphysis, the fetal vertex must pass through the posterior pelvis, where it
Malpresentations, Malpositions, and Multiple Gestation

places strain on the perineum. These fetuses look like they want to deliver through the rectum. However, the delivery is frequently easy.

Manual Rotation

Attempted turning of fetuses in OP position has been undertaken by placing the laboring woman in various positions, such as on the side, squatting, ambulating, on hands and knees, or with the back arched (to make the fetus so uncomfortable it turns itself). A randomized controlled trial (RCT) comparing modified Sims maternal position with freely adopted maternal positions in women with fetuses in OP position showed a higher proportion of fetuses rotating to OA position (50.8% versus 21.7%; \( P = .001 \)) and increased rates of vaginal delivery (84.7% versus 68.3%, \( P = .035 \)) with the modified Sims position.\(^9\) If repositioning the woman fails to rotate the fetus, manual rotation becomes an alternative intervention during a long second stage of labor because it can be attempted during any vaginal examination. If successful, delivery may be greatly expedited; if unsuccessful, no harm is done.

The key to manual rotation is to enhance the natural and normal forces of rotation. Rotation normally occurs when the flexed fetal head strikes the muscles of the pelvic floor, called the levator sling. Therefore, the clinician must first flex the head. This is accomplished by placing a hand in the posterior pelvis behind the occiput. The clinician’s hand replicates and enhances the levator sling effect, acting as a wedge to flex the head and apply rotatory force. Some clinicians also grasp the head with the thumb. The rotation should be attempted at the same time as a contraction when the woman is pushing to force the head down on the levator sling (and the hand), using the natural mechanism for flexion and rotation. An assistant may massage the fetal shoulder in the direction of the rotation with suprapubic or abdominal pressure. Manual rotation can be attempted with the patient in the lithotomy, the lateral Sims, or the hands-and-knees positions. In the hands-and-knees position, the abdominal assist is impractical.

If the fetus is in straight OP position, the dominant hand will be used to rotate the fetus, but rotation should go the shortest distance if the fetus is in ROP or LOP position. Therefore, the fetus in ROP position should be rotated clockwise, and the fetus in LOP position should be rotated counterclockwise. The hand that pronates during the rotation (like closing a book) should be used: left hand for ROP position and right hand for LOP position.\(^10\)

Manual rotation is part of the art of maternity care. It is a neglected skill, but one with minimal risk that requires no technology or instrumentation. Successful manual rotation may shorten the second stage of labor and decrease the likelihood of an assisted vaginal or cesarean delivery. Additional information regarding manual rotation is in the Labor Dystocia chapter.

Vacuum Delivery

Vacuum delivery is an option for fetuses in persistent OP position when the vertex is not appropriately descending. However, OP position is not itself an indication for assisted vaginal delivery. The vacuum cup should be applied to the flexion point anterior to the posterior fontanel to facilitate flexion, which will increase the likelihood of a successful delivery. The clinician may be uncertain of the exact position of the head because of molding, edema, and overriding of sutures. Ultrasound should be considered to determine or confirm position because it is more accurate than digital examination.\(^11\) The vacuum may successfully draw the head out in OP position. Alternatively, in flexing the head and drawing it down against the levator sling, the vacuum may promote rotation. Delivery will then occur in the OA position. The vacuum allows the fetal head to find its own optimal plane for delivery. It is not uncommon for the head to rotate 180 degrees as traction is applied, sometimes in the moment before delivery. However, no direct rotary force should be applied to the cup because this may cause a cookie cutter type injury to the scalp and cause the cup to disengage.

The vacuum cup typically needs to be placed as posteriorly on the head as possible to reach the flexion spot for the fetus in OP position. The mushroom bell cup is best suited for vacuum-assisted delivery of fetuses in OP position (see the Assisted Vaginal Delivery chapter). The mechanism of delivery for a fetus in OP position is the same with a vacuum as with forceps or spontaneous delivery: the fetal vertex takes a more posterior course through the pelvis. As with any vacuum delivery, the shaft of the extractor must be kept at right angles to the plane of the cup, or detachment will occur. OP position increases the incidence of
third- and fourth-degree lacerations because the forces are directed toward the rectum.12

**Forceps Delivery**

With OP presentation, the usual indications for forceps delivery apply (see the Assisted Vaginal Delivery chapter). Forceps fit the OP vertex equally as well as the OA vertex. An OP presentation is not itself a sufficient indication for forceps use. The mechanism of delivery is the same as for a spontaneous OP delivery. The head is delivered by flexion, not extension. The face must pass beneath the symphysis before the head can flex upward, so traction on the forceps must be in a more posterior direction for longer than in OA deliveries. Pressure on the perineum can be intense with resulting third- and fourth-degree lacerations, especially after episiotomy.13

Occasionally, with an OP delivery and a prolonged second stage of labor, severe molding and edema will occur. The fetal vertex will initially appear to be at +2 station or even on the perineum, but careful examination will reveal that the fetal head is elongated and the biparietal diameter is not engaged. Under such circumstances, attempts at assisted delivery are not likely to be successful and may be harmful. Cesarean delivery is indicated, and the lack of engagement may be confirmed by the ease with which the fetus is lifted out of the pelvis.

**Forceps Rotation**

Only skilled clinicians trained in the Scanzoni maneuver of rotation with Kielland forceps should consider using forceps for rotating a fetus in OP position. The application of forceps rotation is not included in the ALSO curriculum. In most US hospitals, these techniques are seldom practiced. However, a recent series of studies has shown a high likelihood of successful rotation with minimal morbidity,14,15 leading to advocacy of expanded training and use of rotational forceps.4

Cesarean delivery should always be the backup method of delivery for any OP presentation that cannot be safely delivered vaginally.

**Breech Presentation**

Breech presentation is defined as the fetal breech, or buttocks, presenting in the birth canal with the head aftercoming in the uterine fundus. Breech presentations may be classified as:

- *Frank breech*: the hips are flexed, and the legs are extended over the anterior surface of the body
- *Complete breech*: the hips and legs are flexed (tailor sitting or squatting)
- *Footling breech*: One or both hips are extended, with one or both feet presenting. One or both feet may commonly be palpable on vaginal examination of a complete breech presentation, but the presentation is not considered footling if the knees are flexed and the buttocks are lower than the feet.

Breech presentation has many predisposing factors. Prematurity is commonly associated with breech presentation. As the fetus approaches term, the incidence of breech presentation decreases to 3% to 4%.16

Other predisposing factors for breech presentation include high parity and relaxation of the uterine and abdominal walls; uterine anomalies (including fibroid tumors); pelvic tumors; polyhydramnios; oligohydramnios; various fetal anomalies including hydrocephalus, anencephaly, and Down syndrome; macrosomia; multiple pregnancy; placenta previa; absolute cephalopelvic disproportion; and previous breech delivery. An ultrasound with a fetal anatomical survey performed by a qualified clinician is indicated when the diagnosis of breech presentation is made in the mid-third trimester or later, but the cause is typically not found.16

**Diagnosis**

The diagnosis of breech presentation can often be made by abdominal palpation and vaginal examination. On Leopold maneuvers, the firm, ballotable, rounded head is felt in the fundus. However, it is common for a breech presentation to be misdiagnosed on Leopold maneuvers during prenatal visits with the diagnosis not made until the patient presents in labor or with rupture of membranes at term. A study of antenatal detection of breech presentation in a large maternity care department in the United Kingdom showed that 27.9% of breech presentations were not detected during prenatal care and that the percentage increased from 23.2% to 32.5% from 1999 to 2009.17 A retrospective study of 251 women with fetuses in breech presentation from 2012 to 2015 also showed that 32% of fetuses in breech presentation were not identified until 38 weeks’ gestation or later and that the cohort diagnosed prior to 38 weeks’ gestation was more likely to have a vaginal delivery (31.1% versus 12.5%; P<.01).18
The Pregnancy Outcome Prediction (POP) study of 3,879 nulliparous women showed that routine ultrasound at 36 weeks’ gestation virtually eliminated unanticipated breech presentation at term and that 40 scans were needed to identify each unanticipated breech presentation.

When the examining clinician is unsure about the presentation at 35 weeks’ or greater gestational age, it is recommended that a vaginal examination or limited ultrasound be performed. The fetal head may be low in the pelvis and difficult to palpate on Leopold maneuvers, yet sutures are palpable on vaginal examination.

On vaginal examination of a breech presentation, small parts or the breech may be detected. If small parts are palpated, it is essential to distinguish between a hand and a foot. The breech itself is smooth and rounded and may feel remarkably like a vertex. Most physicians and midwives who provide maternity care have misdiagnosed a breech on vaginal examination. The key is to seek fontanelles and sutures with the examining finger, which always signifies a vertex.

Breech presentation can be confused with face presentation. In breech presentation, the anus and ischial tuberosities form a straight line, whereas the mouth and malar prominences form a triangle. In addition, the skin of the fetal buttock is smooth. An alert examiner can distinguish it from the hairy feel of the scalp. This subtle sign may raise an examiner’s index of suspicion to perform a more definitive examination. If the examiner’s finger encounters an orifice when membranes are ruptured, the finger can be gently inserted into the orifice. If it is the mouth (signifying a face presentation), the fetus will suck on the finger. If it is the anus (signifying a breech), the finger will be coated with meconium when withdrawn.

**Prenatal Management of Breech Presentation**

There are four elements to the prenatal management of breech presentation. First, a cause must be determined for the breech presentation, most of those that can be identified are detectable by ultrasound. Second, the woman may attempt certain exercises to turn the breech. Third, external cephalic version (ECV) should typically be offered and attempted. Fourth, failing a successful version, a decision must be reached regarding the most favorable mode of delivery.

**Postural Management of Breech Presentation**

Various exercises and positions have been tried to attempt to turn a fetus in breech presentation. No difference in outcome has been shown in a review of trials in which women were randomized to a postural management group or a control group.

The exercises themselves are simple. One exercise method is for the woman to assume a knee-chest position for 15 minutes 3 times a day for 5 days after the diagnosis of the breech presentation. Another version is for the woman to assume a deep Trendelenburg position by elevating the hips 9 to 12 inches while lying supine with a pillow(s) under the hips for 10 minutes once or twice a day (Figure 3). Pelvic rocking while in these positions is often recommended.

Although effectiveness cannot be proven, these exercises are not harmful, and they provide a focus of activity for the woman, who may be anxious regarding the fetus being in a breech position. There are no contraindications to these exercises.

**External Cephalic Version**

External cephalic version, turning a fetus in breech presentation to vertex by manipulation through the woman’s abdominal wall and uterus, has
become an accepted component of the prenatal management of breech presentation. This process is widely supported, including by national guidelines from the American College of Obstetricians and Gynecologists (ACOG) and the Royal College of Obstetricians and Gynaecologists (RCOG), and a 2015 Cochrane systematic review.22-24 This procedure is low-tech, low-cost, and can decrease cesarean delivery rates, which prevents potential operative morbidity. The risk of an adverse event occurring because of ECV is low, and the cesarean delivery rate is significantly lower among women who have undergone a successful ECV. Women near term with fetuses in breech presentation and no contraindication to vaginal delivery should be offered an ECV attempt.25

The success rate of ECV was 53% in a 2008 meta-analysis of 53 articles.25 In a comprehensive program of ECV, cesarean delivery for breech presentation can be reduced by approximately one half. A 2015 Cochrane review of eight RCTs showed a 43% decrease in cesarean deliveries without a significant increase in maternal or fetal complications (95% CI = 40-82).26 The primary factors associated with a successful ECV are parity, gestational age and the amount of amniotic fluid, frank breech presentation, and a relaxed uterus. The clinician’s skill and the woman’s tolerance of the procedure affect the success. In one study, the introduction of a dedicated team of physicians and midwives for ECV increased the success rate of ECV from 39.8% to 69.5% (P<0.001) as well as the vaginal delivery rate (43% to 71%). The success rate in nulliparous women increased from 23.5% to 58.5% (P = 0.002).26

Gestational age is also a factor in the success rate of ECV. ECV is not recommended before approximately 37 weeks’ gestation, unless a patient with a fetus in breech presentation presents in preterm labor or for a medically indicated induction. A study of ECV at 34 to 35 weeks’ gestation compared with 37 weeks’ gestation showed a higher proportion of cephalic presentations at term, but the overall cesarean delivery rate was not decreased.27,28 Performing ECV at 34 to 35 weeks’ gestation presents the risk of delivering a premature infant if urgent cesarean delivery is indicated. After 37 weeks’ gestation, the likelihood of successful ECV decreases as the breech presentation may become engaged in the pelvis. Deferring ECV beyond 37 weeks’ gestation also incurs an increased risk of labor or rupture of membranes occurring while the fetus is in breech presentation. ECV may be attempted in early labor when membranes are intact.22

Although many contraindications to ECV are commonly listed in clinical guidelines or recommendations, there is limited evidence regarding many of these contraindications.25 If vaginal delivery is contraindicated (eg, placenta previa, prior classical cesarean delivery), ECV should not be attempted. A systematic review of other potential contraindications to ECV evaluated five guidelines and showed 18 different contraindications with a range of five to 13 per guideline.25 The review also analyzed 60 articles that described a total of 39 different contraindications, but evidence for the contraindications could only be assessed for six contraindications. The authors of the review concluded that there was only reasonable evidence to support three contraindications: history of placental abruption or current abruption, preeclampsia with severe features (or HELLP syndrome) and concerning fetal monitoring results, including abnormal Doppler ultrasound results.25 All the guidelines included oligohydramnios, and four of the five included intrauterine growth restriction (IUGR), but the systematic review did not show evidence for these common recommendations.25

A commentary on the review recommended that in some of the clinical scenarios commonly described as contraindications, an ECV may be successfully and safely performed in the operating room with regional anesthesia. The author questioned whether severe preeclampsia should be considered a contraindication.25 A prior cesarean delivery in a woman who is a candidate for labor after cesarean (LAC) is not a contraindication for ECV based on small studies and a 2017 ACOG guideline,29,30 though data is not available regarding the rates of uterine rupture with a trial of labor (TOL) after ECV.

Various strategies have been used to increase the success of ECV. Routine tocolysis appears to reduce the failure rate of ECV at term.31 Although promising, there is insufficient evidence to evaluate the use of fetal acoustic stimulation,32 hypnosis, or moxibustion.33,34 Regional anesthesia in combination with a tocolytic drug has been shown to be effective, especially in primiparous women, with no increased rate of complications.35,36-38 A 2011 meta-analysis of six RCTs found that regional
anesthesia increased the success rate of ECV from 37.6% to 59.7% (odds ratio 1.58; 95% CI = 1.29-1.93; NNT = 5). The use of regional anesthesia increases costs and requires the patient to spend a prolonged time in the labor and delivery department while waiting for the regional anesthesia to wear off; however, two studies have shown a beneficial cost analysis.38,39 A small case series using gloves with built-in pressure sensors to measure the amount of pressure used for ECV with and without regional anesthesia showed that less pressure was applied when the patient received regional anesthesia, presumably because the abdominal skeletal muscles provided less resistance.40

Complications of ECV occur in less than 1% of attempts.22 After ECV, rupture of membranes and labor has been noted. There have also been some reports of placental abruption, fetal hemorrhage, maternal hemorrhage, a knotted or entangled cord, and fetal mortality.22,41 Fetal bradycardia and decelerations are common, but they typically resolve spontaneously or with cessation of the procedure. A retrospective study in Japan of 390 patients who underwent ECV showed that 48.5% had a period of fetal bradycardia during or after the procedure. Of the bradycardic episodes, 43.4% lasted less than 1 minute, 88.9% lasted less than 5 minutes, and 98.4% lasted less than 10 minutes.42 The patients who had fetuses with bradycardic episodes had good fetal outcomes; however, two of the three patients with episodes lasting greater than 10 minutes had Apgar scores less than 5 at 5 minutes and arterial cord blood pH levels less than 7.1. This suggests the importance of not proceeding to emergency cesarean delivery for brief periods of bradycardia as well as the importance of preparing for emergency cesarean delivery if the bradycardia does not resolve after approximately 10 minutes.42 When performing ECV, facilities and personnel must be available for performing an immediate cesarean delivery.17

Procedure for External Cephalic Version (This is a sample protocol similar to many published protocols. Other variations exist.)

**Preparation**
- Patient may be accompanied by a support individual
- Patient NPO for 6 to 8 hours prior to the procedure
- Patient gowned, and bladder emptied
- Confirm breech presentation by ultrasound and evaluate for fetal anomalies if not obtained via prior anatomic survey
- Perform nonstress test (NST)
- Obtain consent
- Cesarean delivery personnel and facilities available
- Intravenous (IV) access
- Tocolysis: administer 0.25 mg of terbutaline (subcutaneous) 15 minutes before starting ECV, or IV immediately before the procedure
- Position: supine, slight left lateral tilt, Trendelenburg, knees slightly bent
- Abdomen coated with ultrasound gel (optional)

**Procedure (for two clinicians)**
- Clinician 1 elevates the fetus in breech presentation from pelvis by placing a hand suprapublically beneath the fetal buttocks (*Figure 4*)
- Clinician 1 pushes the fetus into the iliac fossa
- Clinician 2 flexes the head (for a forward roll) and rotates the fetus into an oblique lie
- Two-thirds of the force or pressure should be applied to the breech, and one-third of the force should be applied to the head. Avoid excessive force
- Both clinicians should rotate the fetus slowly around using just enough force to move the fetus. Progress will occur in stages, or *cogwheel* fashion. The fetus will rotate slightly, then resist, then rotate more. Allow the woman and fetus brief rest periods when resistance is felt, while attempting to maintain the progress already achieved
- Monitoring should be performed periodically during and after the attempt at ECV and may be performed via ultrasound, external fetal monitor, or a Doppler stethoscope
- When the fetus is just past the transverse, it may rotate the rest of the way without effort as it adjusts to the shape of the uterus
- The vertex may be guided gently over and into the pelvic inlet with suprapubic manipulation and fundal pressure
- Perform ultrasound to confirm status
- After successful version, monitor for a minimum of 20 to 40 minutes and until a reactive NST result is obtained
- In patients who are Rh negative, administer Rh(D) immune globulin; may obtain Kleihauer-Betke test
• If the forward roll fails, try a backward flip, especially if the vertex and breech lie on the same side of the maternal midline
• If not successful after 15 to 20 minutes, discontinue the procedure
• If the patient feels sharp pain or is unable to tolerate the procedure, discontinue until she is comfortable and then reassess whether to proceed or discontinue the procedure. Use of regional anesthesia can be considered
• If bradycardia occurs, discontinue the procedure. If it persists, revert the fetus to its original breech position. If bradycardia persists, prepare for cesarean delivery

**Figure 4. Elevating Breech with Suprapubic Hand**
• If using regional anesthesia, wait until the anesthesiologist is confident that blood pressure levels are stable because it can be difficult to distinguish fetal bradycardia from hypotension versus the ECV procedure itself.

After a successful ECV, physicians and patients may consider elective induction of labor to prevent reversion to breech presentation while the woman is hospitalized, with IV access and possibly regional anesthesia. This is typically not recommended unless there is another obstetric indication, because the likelihood of reversion to breech presentation is approximately 5%.44,45 If, however, a second ECV is required after a fetus has reverted to breech presentation, induction may be considered after 39 weeks’ gestation. Induction is not indicated at an earlier gestational age.46,47

Choosing Delivery Route for Breech Presentation

The optimal delivery route for a fetus in breech presentation is controversial. In the United States, most fetuses in breech presentation are delivered by cesarean delivery. In 2003, 85% of fetuses in breech presentation were delivered via cesarean delivery, and the rate currently is greater than 95% in many areas.48,49 The practice of routine cesarean delivery for breech presentation was adopted without high-level evidence supporting this intervention. Cesarean delivery does not prevent all infant morbidity, which in some instances may arise from the same problems that caused the breech presentation (eg, neuromuscular disease, oligohydramnios, polyhydramnios).50

A multicenter, international RCT (Term Breech Trial [TBT]) compared elective cesarean delivery with vaginal delivery for select breech presentations: greater than 37 weeks’ gestation, frank or complete breech, and less than 4,000 g (approximately 8.8 lb) estimated fetal weight.51 This trial was discontinued early in 2000 after analysis of short-term outcomes showed significant reductions in perinatal mortality and morbidity, and no increase in serious maternal complications in the elective cesarean delivery group.51 The short-term outcomes from the TBT showed that the incidence of perinatal mortality, neonatal mortality, or serious neonatal morbidity was 1.6% in the planned cesarean delivery group compared with 5% in the planned vaginal delivery group (relative risk [RR] 0.33; 95% CI = 0.19–0.56; P<0.0001).

National guidelines and commentaries after the TBT suggested that planned vaginal delivery of a breech fetus may no longer be an acceptable option except when a woman refuses the recommended cesarean delivery.22,52,53

After publication of the TBT, two additional studies were published that led to a reconsideration of the initial recommendation that planned vaginal delivery of a fetus in breech presentation may not be appropriate. The 2-year neonatal outcomes of the TBT were published in 2003 and showed no difference in neurodevelopmental outcomes in the 79.6% of the infants that were monitored for 2 years.54 The 2-year outcomes were monitored only in settings that estimated a greater than 80% 2-year follow-up could be achieved. The long-term outcomes showed that the surrogate outcomes of morbidity in the short-term TBT outcomes, such as decreased neuromuscular tone at 2 hours, were poorly predictive of long-term developmental outcomes. In the subset monitored for 2 years, there was no difference in the combined perinatal mortality and abnormal neurologic outcome: 3.1% in the planned cesarean delivery group, and 2.8% in the TOL group. Seventeen of the 18 infants with serious neonatal morbidity were developmentally normal at 2 years.54

The Presentation et Mode d’Accouchement: presentation and mode of delivery (PREMODA) observational study took place at 174 centers in France and Belgium.55 Strict protocols for patient selection for planned vaginal breech delivery and for labor management were used, and 8,105 women were monitored, representing 4 times the number monitored in the TBT. Thirty-one percent of women in the study planned for vaginal delivery. Of the 2,526 women with a TOL, 1,796 (71%) delivered vaginally for an overall vaginal birth rate of 22.5% in the entire cohort. There was no difference in fetal mortality (0.08% versus 0.15%; relative risk [RR] 0.64; 95% CI = 0.13–3.06) or combined fetal/neonatal mortality and serious neonatal morbidity (1.6% versus 1.4%; RR 1.10; 95% CI = 0.75–1.61) between the planned vaginal delivery and planned cesarean delivery groups. The PREMODA study differed from the TBT in requiring an obstetric ultrasound, having rapid access to emergency cesarean delivery, and converting to cesarean delivery sooner when labor was prolonged. An example is that a second stage of labor of up to 3.5 hours was permissible in the
TBT, but in the PREMODA study the TOL was typically converted to cesarean delivery when the active second stage of labor exceeded 1 hour. Only 0.2% of women in the PREMODA study had an active second stage of labor longer than 1 hour compared with 5% in the TBT.51,55

Current ACOG and RCOG guidelines state it is acceptable to offer vaginal breech delivery based on hospital-based protocols if an experienced physician is available and the patient chooses vaginal breech delivery after careful counseling about risks.52,56

The 2016 SOGC guidelines encourage retraining of obstetricians in vaginal breech delivery and recommend that women be offered options of vaginal breech delivery or cesarean delivery based on the individual clinical situation.57 The SOGC guidelines on patient selection and labor management are adapted from the PREMODA study protocols. The SOGC guidelines estimated that perinatal mortality in appropriately selected patients is between 0.8 and 1.7 per 1,000 for planned vaginal breech delivery and between 0 and 0.8 per 1,000 for planned cesarean delivery.57 RCOG describes perinatal mortality by comparing rates between planned vaginal breech delivery (2 per 1,000), planned vaginal cephalic delivery (1 per 1000), and planned cesarean delivery after 39 weeks’ gestation (0.5 per 1,000).52 RCOG guidelines include the perspective that the risks in vaginal breech delivery are due in part to intrapartum risks that are also present in vaginal cephalic delivery, risk of stillbirth due to continuing pregnancy beyond 39 weeks’ gestation, and risks inherent in vaginal breech delivery.52

Planned vaginal breech delivery remains controversial. Epidemiologic studies in Scandinavia and Canada showed that vaginal breech delivery continues to be associated with an increased incidence of neonatal morbidity and mortality, the rates of which appear to be decreasing overall in association with increasing cesarean delivery rates for breech presentation.49,58,59 A 2015 Cochrane review showed decreased short-term neonatal mortality and morbidity with increased short-term maternal mortality in settings with low perinatal mortality. The level of evidence was considered low, and the authors concluded that the benefits of elective cesarean delivery needed to be weighed against the preference of some women for vaginal delivery.27 A 2015 meta-analysis of 27 studies, which included observational studies, of a total of 258,953 women, showed increased relative risk of neonatal morbidity and mortality in the range of 2 to 5 times with vaginal breech delivery versus cesarean delivery, yet low absolute delivery rates. The study results found that individualized decision making remains appropriate.60

Two considerations, not strictly medical, affect the decision about whether to perform a cesarean or vaginal delivery. First, the skills to perform a safe vaginal breech delivery are not taught in many residency programs, and clinicians who retain these skills are aging. Second, the medicolegal ramifications of vaginal delivery are unacceptable to many clinicians. Elective vaginal breech delivery is beyond the scope of the ALSO course, but the skills to perform an unplanned emergency vaginal breech delivery are essential for all maternity care clinicians. An understanding of the selection criteria and controversies regarding elective vaginal breech delivery may help maternity care clinicians decide if vaginal delivery is a reasonable option. In some situations, the physician or midwife will not have time to assess for appropriate candidacy or to convert to emergency cesarean delivery.

Certain contraindications exist for elective vaginal delivery of a fetus in breech presentation (Table 2):

- Unfavorable pelvis: if the pelvis is known to be small, or if it is android or platypelloid, vagi-

<table>
<thead>
<tr>
<th>Table 2. Contraindications to Elective Vaginal Breech Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macrosomia (defined variously from 3,800 g (approximately 8.4 lb) upward)</td>
</tr>
<tr>
<td>Lack of physician experience with vaginal breech delivery</td>
</tr>
<tr>
<td>Footling breech presentation</td>
</tr>
<tr>
<td>Occult cord prolapse</td>
</tr>
<tr>
<td>Intrauterine growth restriction</td>
</tr>
<tr>
<td>Lack of facilities and personnel to switch rapidly to cesarean delivery</td>
</tr>
<tr>
<td>Fetal anomalies preventing vaginal delivery</td>
</tr>
<tr>
<td>Clinical or x-ray evidence of inadequate pelvis</td>
</tr>
<tr>
<td>Extended (stargazing) head on ultrasound examination</td>
</tr>
</tbody>
</table>

Malpresentations, Malpositions, and Multiple Gestation

Malpresentations, Malpositions, and Multiple Gestation —

Nal delivery should not be attempted. Magnetic resonance imaging (MRI) or computed tomography (CT) pelvimetry have been used in some studies. However, radiologic pelvimetry has not been shown to improve outcomes in vaginal breech deliveries. The SOGC guidelines recommend clinical pelvimetry and state that radiologic pelvimetry is not necessary for a safe TOL with a fetus in breech presentation. MRI is the preferred study because of risks of maternal and fetal radiation exposure from pelvic CT.57

- Macrosomia (defined variously from 3,800 g [approximately 8.4 lb] upward)
- Severe prematurity (defined variously)
- Intrauterine growth restriction or evidence of placental insufficiency
- Footling breech presentation: the feet may be palpable in many complete breech presentations, and a trial of vaginal breech delivery is acceptable. However, if the feet descend below the buttocks during the first stage of labor, a cesarean delivery is indicated
- Hyperextension of the fetal head (stargazer): delivery can be difficult, and labor can result in high incidence of spinal cord or other neurologic injuries as a result of a hyperextended head. An ultrasound should be performed at the start of labor to determine the attitude of the fetal head
- Fetal anomalies (eg, hydrocephalus)
- Absence of labor (eg, patients with prelabor rupture of membranes, nonprogressive labor): induction and augmentation of labor are controversial, and often avoided in favor of cesarean delivery. However, in the PREMODA study, 74% of women received augmentation with oxytocin. Augmentation may be reasonable if undertaken to increase infrequent contractions to every 2 to 4 minutes rather than to increase the strength of contractions that are already occurring at an acceptable frequency. RCOG and SOGC state that oxytocin augmentation is acceptable for treating weak or infrequent uterine contractions. The 2009 SOGC guidelines recommended against labor induction; however, the 2019 SOGC guidelines state that, although evidence is limited, induction appears to be a safe option in well-selected patients. Lack of a clinician with the experience and skill necessary for vaginal delivery and ability to maintain an operating room team (ie, nursing personnel, anesthesia personnel)

Various scoring systems have been developed to predict outcomes of vaginal breech delivery. The best known of these systems is the Zatuchni-Andros prognostic scoring index. It assigns points for parity, gestational age less than 37 weeks, estimated fetal weight less than 3.18 kg (7.01 lb), previous breech delivery, dilation at presentation, and station at presentation. This system has several deficiencies including rewarding prematurity and the woman who labors at home who presents at a greater dilation and lower station. However, a better validated system of predicting breech outcomes has not been developed. The use of appropriate selection criteria and converting to cesarean delivery when labor progress is not adequate are the essential clinical components in the treatment of women who desire a trial of vaginal breech delivery.

In summary, the decision regarding the best mode of delivery of a fetus in breech presentation is complicated. Many factors must be considered, including the best conclusions from the medical literature, community and national standards as well as the individual case, the woman’s wishes, and the clinician’s skill.

Labor and Vaginal Delivery of a Fetus in Breech Presentation

A standard method of vaginal breech delivery is presented here, but acceptable variations exist. The ALSO program presents this method as one that is widely accepted and can be learned and practiced on a mannequin—but not necessarily as the only one, nor even the best. Although planned vaginal breech delivery remains an acceptable option for the skilled maternity care clinician under well-delineated hospital guidelines, the focus of the method presented here is the unplanned urgent vaginal breech delivery. Every maternity care clinician should know how to deliver a fetus in breech presentation.

Fundamental differences exist between delivery of infants in vertex and breech presentations. In vertex presentation, the fetus’s largest part, the head, delivers first. Molding of the cranium can occur over several hours. In a breech delivery, the order of presentation is the buttocks, the shoulders, and the head with each part larger and less compressible than the one before. Molding of the
head does not occur because the fetal head is in
the pelvis for only a few minutes, and because the
head enters the pelvis with the base of the skull
leading, which unlike the vertex, cannot mold.
The challenge of the vaginal breech delivery is
that the last part of the fetus to deliver is the larg-
est part, and it might not fit through the pelvis.

Most clinical recommendations for vaginal
delivery of the fetus in breech presentation have
described delivery occurring in the dorsal lithot-
omy position, which was common when vaginal
breech delivery was routine (pre-1980s). Based
on this, in 2006, the RCOG advised that vagi-
nal breech delivery occur in the dorsal lithotomy
position because of a lack of studies or experience
with alternative positions (eg, squatting, hands
and knees, upright); however, the 2017 RCOG
guidelines state that a recumbent or all-fours posi-
tion may be used based on maternal preference
and clinician experience. A retrospective German
study of 229 successful vaginal breech deliveries
performed in the upright position compared with
40 deliveries performed in the dorsal lithotomy
position between 2004 and 2011 found use of
the upright position reduced the duration of the
second stage of labor, the need for delivery maneu-
vers, and neonatal birth injuries.

Labor with a fetus in breech presentation is
similar to labor with a fetus in vertex position and
may be allowed to continue spontaneously if the
woman is a candidate for vaginal breech delivery
and has been appropriately counseled, if progres-
sive dilation and descent occur, and there is no
fetal or maternal compromise. Most vaginal breech
deliveries require a minimal number of maneu-
vers. Careful observation during each stage of the
delivery and knowing when to assist the delivery
and how to manage complications are essential for
a safe vaginal breech delivery. The ALSO program
has developed the CAREFUL mnemonic as a
standardized technique for the vaginal delivery of a
fetus in breech presentation.

Breech mnemonic: CAREFUL

- Check presentation, dilation, and cord
- Await umbilicus
- Rotate for arms
- Enter for the Mauriceau-Smellie-Veit (MSV) maneuver
- Flex head
- Back Up (sacrum anterior)
- Lift baby onto mother

Check for Complete Dilation and Presenting Part, and Rule Out Cord Prolapse

The cervix must be completely dilated to avoid
the potential for catastrophic cervical head entrap-
ment. The determination of complete dilation
with a fetus in breech presentation can be difficult
because the clinician is feeling for the soft thin
cervix against the soft buttocks rather than the hard
skull. Because of the increased incidence of cord
prolapse, it is essential to feel for an occult cord and
to ensure that the buttocks are the leading part.

After the cervix is fully dilated, a period of
passive descent should be considered. This gives
additional assurance that no cervix remains, and
it shortens the period of active pushing. A fetus
in breech presentation can experience repetitive
variable decelerations because of cord compres-
sion during the active second stage of labor. The
SOGC guidelines recommend converting to
cesarean delivery if delivery is not imminent after
1 hour of active pushing but permit up to 90 min-
utes of passive second stage.

A frank breech presentation will distend the
perineum and dilate the introitus similar to a
vertex presentation. Episiotomy was traditionally
recommended, but selective use is now recom-
mended when additional room is required to enter
the vagina to perform maneuvers (eg, Piper forceps
application) to facilitate delivery. Episiotomy will
not create more room in the bony pelvis and can
be difficult to perform after the body, except for
the head, has been delivered.

Await Umbilicus

Typically, the fetus in frank breech position deliv-
ers with the axis of the hips in the AP plane, and
the fetal sacrum will be to the left or the right. The
anterior hip descends in to the introitus and passes
below the symphysis in a manner analogous to the
anterior shoulder. With lateral flexion of the fetal
body, the posterior hip delivers over the perineum.
External rotation follows delivery of the fetus,
allowing the back to turn anteriorly.

Delivery should proceed spontaneously until
the fetal umbilicus appears at the introitus. The
woman should be making strong, controlled
pushing efforts. Traction by the clinician before
delivery of the umbilicus may promote exten-
sion of the fetal head or nuchal placement of the
arms; therefore, the clinician should not pull on
the fetus until the umbilicus is delivered, and
even then, traction is not necessary if the delivery continues to progress.

When the umbilicus delivers, a loop of several inches may be pulled down gently, but doing so is optional. If performed, it prevents tension on the cord as the body delivers and allows easy monitoring of the fetal pulse by palpation. The legs of a fetus in frank breech presentation may be delivered by inserting a finger behind the knee to flex the knee and abduct the thigh (Pinard maneuver [Figure 5]). Efforts to deliver the legs are not mandatory because the legs will deliver spontaneously, and the feet will spring free eventually.

After the umbilicus is delivered, gentle downward traction may be used to deliver the torso. The fetus may be grasped on the pelvis by the clinician’s fingers, with thumbs on the sacroiliac regions. This avoids placing the hands too high on the fetus and injuring abdominal organs such as the spleen or liver. Traction should be in a 45-degree downward axis, toward the floor. The clinician may assume a position below the fetus (ie, on one knee in front of a delivery room table).

**Rotate for Arms**

Delivery of the fetal trunk may be quick and may not require effort by the clinician, or delivery may require considerable effort. Rotation of the fetal back from one anterior oblique to the other may facilitate the extraction of the trunk and encourage the fetal arms to move to a flexed position across the chest. It is critical to keep the back up (sacrum anterior) during the delivery because it allows the fetal head to enter the pelvis OA. If the fetus rotates to the abdomen-up (sacrum posterior) position, the head will present unfavorable diameters to the maternal pelvis, jeopardizing a safe delivery.

Delivery of the arms occurs by rotating the fetal body into an oblique position. The tip of the fetal scapula will come into view, typically being easy to identify because it is *winged*. The anterior arm may then be swept down across the fetal chest and out of the introitus. If possible, the humerus should be splinted with two fingers rather than hooking the antecubital fossa, or elbow pit, with a finger. Rotation of the fetus into the opposite oblique lie allows delivery of the opposite arm in a similar fashion.

**Enter for Mauriceau-Smellie-Veit Maneuver and Flex Head**

Delivery of the head follows delivery of the trunk and is potentially the most difficult and hazardous part of the breech delivery. After the delivery of the arms, the head follows rapidly and spontaneously. Alternatively, the head may not be low enough in the pelvis to initiate assistive efforts. The clinician should attempt to see the nape of the neck. If not visible, the fetus can be allowed to...
dangle with the head still inside the pelvis for up to 30 seconds while ensuring the fetus does not fall to the floor. The sacrum must be anterior.\(^1\)

The head must be delivered by flexion through the pelvis. When the breech head is flexed and OA, and passes through the birth canal by further flexion, the same favorable diameters are presented to the pelvis as in a vertex OA delivery. A modification of the MSV maneuver that is designed to promote flexion is recommended to deliver the head. One of the clinician’s hands should be placed inside the vagina superior to the fetus with one finger placed on the occiput, and one finger on each of the fetal shoulders. The other hand is placed beneath the fetus. The classic MSV maneuver describes placing a finger in the mouth, but this is no longer recommended because traction on the jaw can cause dislocation. As an alternative, two fingers may be placed on the maxillae. An assistant should follow the head abdominally and be prepared to apply suprapubic pressure to flex the head through the pelvis. The fetus may be wrapped in a sling that is held by the assistant or may be draped on the clinician’s lower arm before delivery of the head.

After the head is in the appropriate position, the assisted delivery of the head commences. The head is flexed through the pelvis by four separate mechanisms: the occipital finger applies flexing pressure on the occiput, the assistant also applies suprapubic pressure on the occiput, the fingers on the maxillae apply pressure on the lower face to promote flexion, and the fetal body is raised upward by the sling in a large arc. Although strong controlled expulsive efforts by the woman are most helpful, some traction is also required for the delivery. This is accomplished by applying downward pressure from the fingers on the shoulders. The assistant who is holding the fetus by a sling may also hold the feet and pull gently as the body describes its arc. The fetal body should stay in a neutral position with regard to the head to avoid hyperextension. Ultimately, the body becomes inverted in the vertical plane, and at this point, an assistant must hold the feet to prevent the fetus from falling to the floor.

**Back Up**

The breech delivery is almost always accompanied by rotation into a sacrum anterior position as the trunk is delivering after the buttocks. In the unusual situation where the fetus attempts to move into a sacrum posterior position, the delivering clinician must gently guide and rotate the fetus into the sacrum anterior position before the delivery of the arms.

**Lift Baby Onto Mother**

As the mouth and nose appear over the perineum, they may be suctioned. The cranial vault then delivers by further flexion; the clinician may use the Ritgen maneuver. As the head emerges, the infant’s body flips over past vertical onto the woman’s abdomen. Delayed cord clamping is appropriate if the infant does not need resuscitation or additional treatment. It is more common for breech infants to be born with decreased tone and to require resuscitation, such as positive pressure ventilation, likely because of increased cord compression during the second stage of labor. In all vaginal breech deliveries, additional personnel must be present to perform neonatal resuscitation if needed.

**Delivery in the Upright or All-Fours Positions**

Vaginal breech delivery in an upright or all-fours position is now considered an acceptable option by RCOG and the Australian *Becoming a Breech Expert Course Manual* if the position is preferred by the woman and the clinician is experienced in its use.\(^{52,65}\) Conversion to dorsal lithotomy position may be required to manage rare complications such as head entrapment. A 2017 case report demonstrated vaginal breech delivery in the upright position using a sequence of photographic images.\(^66\) A 2017 study included descriptions of maneuvers that can be used in the upright position for shoulder dystocia (eg, the 180-degree torque maneuver) and to facilitate flexion to deliver the fetal head by pushing the fetus’s shoulders against the pubic bone (the Frank nudge maneuver).\(^64\)

**Cesarean Delivery of a Fetus in Breech Presentation**

Most planned breech deliveries in high-resource settings occur by cesarean delivery. Even when a vaginal breech delivery is planned, a substantial proportion will need to be converted to cesarean delivery as shown by the 29% cesarean delivery rate in the planned vagina breech group in the PREMODA study.\(^55\) Some of these deliveries will need to be converted emergently because of
cord prolapse, fetal intolerance of second stage of labor, or rarely, abdominal rescue from a difficult vaginal breech delivery. The SOGC recommends the active second stage of labor occur near an operating room with personnel present to convert to emergent cesarean delivery, and RCOG guidelines state that ready access to cesarean delivery is important.\footnote{22,57}

Extraction of a fetus in breech presentation during cesarean delivery requires maneuvers like those used in vaginal delivery. Therefore, cesarean delivery of a fetus in breech presentation is an opportunity for a surgeon to practice the mechanics of vaginal breech delivery. The goal of cesarean delivery of a fetus in breech presentation is a gentle delivery. If the uterine or abdominal incisions are too small for easy delivery, they can be enlarged. This is not an option during vaginal delivery.

Piper Forceps

Piper forceps were designed to deliver the upcoming head of a fetus in breech presentation. They are long and have an axis-traction curve. It is impossible to determine if Piper forceps application is appropriate by visualizing the placement of the Piper forceps on the fetal head, so they are always applied the same way—straight to the maternal pelvis as if the fetal position were OA. The blades are springy and grasp the fetal head in a nonspecific basket catch that has proved safe and effective.\footnote{1}

Forceps are indicated when the MSV maneuver fails. Although strict guidelines are lacking, Piper forceps should be considered if 2 or 3 minutes have passed without progress while attempting the MSV maneuver. Piper forceps may also be applied prophylactically if a fetus is thought to be fragile, such as a premature fetus. It is prudent to have Piper forceps readily available for any vaginal breech delivery, but Simpson forceps or other forceps can be used in an emergency.

To apply Piper forceps, the fetus (including the arms) is wrapped in a sling and gently held up and to the clinician’s left. The left blade is always applied first. It is held in the clinician’s left hand and is applied to the left side of the woman’s pelvis (but to the right side of the fetus). Unlike other forceps applications, the clinician holds the handle in a horizontal position and below the fetus. The right hand is placed in the vagina alongside the fetal head to protect the vaginal sidewalls. Then the forceps blade is inserted between the right hand and the fetal head, following thecephalic curve of the blade around the head. After insertion, the handle may be supported by an assistant or allowed to dangle.

The right blade is then inserted in a similar fashion by grasping the handle with the right hand and sliding the blade into the vagina alongside the head while protecting the sidewall with the left hand. The forceps should then be locked. When the right blade is applied over the left blade, the lock will articulate normally. The handles are typically separated slightly away from the lock and should not be squeezed together. Because the clinician cannot determine how the blade is applied to the fetal head and face, no effort is made to do so.

Delivery of the head may commence when the application is complete. The clinician applies a small amount of traction to the forceps. Because the shanks of the forceps have a large axis-traction curve, no special maneuvers (eg, the Pajot maneuver) are required to ensure that traction is in the correct vector. The primary motion of the forceps is to raise the handles in a large arc, starting approximately horizontal and ending at or past vertical. This arc will flex the head through the pelvis with the same geometry as the MSV maneuver but with greatly increased leverage because of the length of the forceps. None of the flexing maneuvers of the MSV maneuver are required when Piper forceps are used. The fetus may be held in the sling or laid on the shanks of the forceps during the delivery.

The principal difficulty in applying Piper forceps is a result of the condition that indicates their use. That is, failure of the MSV maneuver implies a tight fit of the fetal head in the maternal pelvis. There may be an insufficient amount of room to place a hand alongside the head. In this situation, the blade must be blindly applied with risk of injury to the woman and fetus. After the Piper forceps are in place, delivery can be accomplished in almost every case. Training in Piper forceps is beyond the scope of the ALSO Vaginal Breech Delivery and Malpresentations workshop, but physicians who anticipate participating in emergency or elective vaginal breech deliveries in settings where they may be called on to deliver a trapped head are encouraged to seek additional training. Elective use of Piper forceps during cesarean delivery can provide an opportunity for training.\footnote{49}
Complications of Breech Delivery

Nuchal arm occurs when one or both arms are extended upward behind the neck, which may impede delivery of the head. When this occurs, three delivery options exist. If the fetus is small or the pelvis is large, the head and extended arm may be delivered together. Alternatively, the clinician may attempt to flex the arm and sweep it down over the face and chest. As a maneuver of last resort, the clinician may rotate the fetus 90 to 180 degrees in the direction of the hand to sweep the arm out of its nuchal position (clockwise for a left nuchal arm, counterclockwise for a right nuchal arm).

Medical management of cervical entrapment may be attempted using nitroglycerin to cause rapid but transient relaxation of the uterus. Intravenous nitroglycerin may be administered by an anesthetist, or sublingual spray may be used if available. Because of the rare and emergent nature of head entrapment during vaginal breech birth, there are no published studies of medical management.

Resolution without excessive traction may require cutting the cervix, a procedure known as Duhrssen incisions. Ring forceps are placed in pairs, parallel to each other at 2 o’clock, 10 o’clock and, if possible, 6 o’clock, extending 3 cm to 4 cm into the cervix. A radial incision is made between the ring forceps of each pair. Anesthesia and exposure are major technical problems, and hemorrhage is a major potential complication. This procedure is recommended only in the most extreme life-threatening circumstances.

The fetus with hydrocephalus may present as a breech delivery with an entrapped head. The appearance of a meningomyelocele, or spina bifida, may indicate the presence of hydrocephalus, which occurs in approximately one-third of such cases. A prenatal diagnosis of hydrocephalus will require highly individualized management and probable cesarean delivery. An unexpected diagnosis at the time of a breech delivery presents a significant dilemma. If cesarean delivery is available, emergent cesarean delivery for abdominal rescue will be required. Decompression of the fetal ventricles, or cephalocentesis, may be detrimental to the fetus, but it is the only way for the delivery to be completed if the fetus is alive and rapid cesarean delivery is not available. Cephalocentesis may be undertaken transvaginally or transabdominally with a long needle.

Symphysiotomy is an emergency maneuver for incising the ligaments of the pelvic symphysis to release a trapped aftercoming head (Figure 6). It is rarely used in high-resource settings, but its use in low-resource settings without ready access to emergency cesarean delivery can be lifesaving. Maternal risks include urological and orthopedic injuries.

Transverse Lie, or Shoulder Presentation

In transverse lie, the long axis of the fetus is approximately perpendicular or at right angles to that of the woman. In the back-down transverse lie, or shoulder presentation, the shoulder is over the pelvic inlet, the head is lying in one of the iliac fossae and the breech in the other. Transverse lie can also occur in the back-up orientation, most commonly in a second twin. On occasion, an unstable or oblique lie will be noted, in which the fetus switches from a breech or vertex to a transverse lie or assumes an intermediate lie.
Transverse lie occurs in approximately 0.3% of singleton deliveries. The common causes of transverse lie are unusual relaxation of the abdominal wall, preterm fetus, placenta previa, abnormal uterus (eg, subseptate uterus, fibroids), contracted pelvis, tumor occluding the birth canal, and polyhydramnios.

Diagnosis
A suspected transverse lie presentation identified by vaginal examination will require confirmation with an ultrasound. On vaginal examination, the fetal head will not be felt and other body parts likely will not be felt in the pelvis. Using Leopold maneuvers, the fetal head may be palpable to the left or right of center near the maternal umbilicus.

Mechanism of Labor and Management of Delivery
Spontaneous delivery of a full-term fetus in transverse lie is impossible. Therefore, cesarean delivery is required in most cases. If transverse lie is identified before the onset of labor or in early labor with intact membranes, an attempt of ECV is reasonable if there are no contraindications to vaginal delivery (eg, placenta previa).

When labor ensues with a back-down transverse lie, the shoulder is forced into the pelvis and an arm may prolapse. With continued labor, a retraction ring may develop. Ultimately, in a neglected labor, the uterus ruptures and the woman and fetus are at risk of mortality. This scenario is rarely seen in modern obstetrics, but it may be encountered in parts of the world where health care access is limited.

Cesarean delivery for a back-down transverse lie may require a low vertical or classical incision for the clinician to successfully deliver one of the fetal poles through the uterine incision. A transverse uterine incision often will be adequate for delivery and has the benefit of allowing a TOL in future pregnancies. If the initial transverse incision does not allow the feet to be reached, a T extension can be performed.

Face Presentation
In a face presentation, the head is hyperextended so the occiput is in contact with the fetal back, and the face is the presenting part. The skull that presents to the pelvis is the submentobregmatic diameter, which when the chin (mentum) is anterior, is favorable for most deliveries. Face presentation occurs in 0.2% to 0.3% of singleton deliveries. When the fetus is large or the pelvis is contracted, there is a predisposition for extension of the fetal head. The pendulous abdomen of a grand multipara also predisposes to extension of the fetal head. In exceptional instances, extension also can be caused by enlargement of the neck because of goiter, cystic hygroma, or numerous coils of cord around the neck. Anencephalic fetuses often present with the face because of absent development of the cranium.

Diagnosis
The clinical diagnosis of a face presentation usually is made by vaginal examination. The mouth, nose, and the malar prominences may be palpated. As previously discussed, a face presentation may be confused with a breech presentation, particularly because breech is approximately 20 times more common (Table 1). The mouth may be mistaken for the anus, and the malar prominences may be mistaken for the ischial tuberosities.

Mechanism of Labor
The key for successful delivery of a face presentation is for the chin to be under the pubic symphysis or for the fetus to be in the mentum anterior position. With further descent of the fetus, the cranial vault can sweep through the posterior pelvis and the head can be delivered by flexion with conversion to an OP delivery.

Although this mechanism does not present the most favorable diameter of the fetal head to the pelvis, if the fetus is not too large and the pelvis is adequate, spontaneous delivery can occur. If the chin rotates or remains posterior, there is no mechanism that allows the fetus to use the space in the posterior pelvis in the hollow of the sacrum, and delivery cannot occur. Forceps or manual rotation of a mentum posterior presentation should not be attempted because of the risk of fetal spinal cord injury.

Management of Delivery
Spontaneous vaginal delivery may occur sometimes with surprising ease. The fetus must rotate to a mentum anterior position. Rotation from mentum posterior or mentum transverse often occurs late in the second stage of labor; therefore,
cesarean delivery should not occur at initial identification of this presentation. Expectant management is recommended even if identified in the second stage of labor if progress is occurring and results of fetal monitoring are not concerning.

A persistent mentum posterior without labor progress in the first or second stages of labor mandates a cesarean delivery. Forceps can be safely and successfully applied to a mentum anterior that is on the perineum. Use of a vacuum extractor is absolutely contraindicated. Likewise, scalp electrode internal monitoring is contraindicated to avoid injury to the face. There is an increased incidence of variable and late decelerations, and oxytocin augmentation should only be used with caution. Parents should be prepared for the infant’s face to have significant bruises and edema, but recovery occurs within 24 to 48 hours.

**Brow Presentation**

In a brow presentation, the portion of the fetal head between the orbital ridge and the anterior fontanel presents at the pelvic inlet. The fetal head is in an attitude between full flexion (or occiput) and full extension (or face). The presenting fetal skull is the occipitomental diameter, which is unfavorable for delivery. Delivery of a persistent brow typically cannot occur unless the fetus is small, or the pelvis is large.

Brow presentation occurs in 0.007% of singleton deliveries. The causes of this rare presentation are similar to those for face presentation. A brow presentation is typically unstable and often will convert to a face or a vertex presentation.

**Diagnosis**

Diagnosis of a brow presentation is made by vaginal examination. The frontal suture, anterior fontanel, orbital ridges, eyes, and root of the nose may be felt. Frequently, the examination is confusing because of edema and unfamiliarity of the presenting features.

**Mechanism and Management of Labor**

The fetus in persistent brow presentation cannot be delivered vaginally under normal conditions. If the fetus converts to vertex or face presentation, delivery may occur according to the respective mechanisms for these presentations. In the absence of conversion and progress of labor, cesarean delivery is required.

**Compound Presentation**

In a compound presentation an extremity, typically a hand, prolapses alongside the main presenting part, typically the head. Often, no cause is found. This presentation is more common with premature infants and when the fetal presenting part does not completely occlude the pelvic inlet.

**Diagnosis**

The diagnosis of compound presentation is typically made by vaginal examination. It is critical to distinguish between a hand and a foot prolapsed alongside the head.

**Management of Delivery**

If labor is progressing normally, no intervention is necessary. Most commonly, the prolapsed limb will deliver spontaneously along with the head, or sometimes the fetus will retract its limb spontaneously. If the prolapsed arm appears to be impeding descent, it should be gently elevated upward, and the head manipulated simultaneously downward. On occasion, cesarean delivery will be necessary. Parents should be told to expect bruising and edema of the prolapsed extremity.

**Prolapse of the Umbilical Cord**

Prolapse of the umbilical cord is an obstetric emergency. The cord may become compressed or occluded between the presenting part of the fetus and the pelvic brim or sidewall, resulting in asphyxia and mortality. The incidence of cord prolapse is 0.1% to 0.6% in vertex presentations. The incidence of cord prolapse is slightly increased in frank breech presentation, occurring in less than 1% of labors; however, the rate in footling breech presentation is markedly increased at approximately 10%.

Cord prolapse is most common when the fetus does not occlude the pelvic inlet, as in a footling breech presentation. Other factors that may contribute to cord prolapse are prematurity, polyhydramnios, high presenting part, and a long cord. Approximately 50% of umbilical cord prolapses follow obstetric interventions, such as when the membranes are ruptured with the presenting part high out of the pelvis and the gush of fluid may then push the cord down into the vagina. In addition, the cord may have already been coiled beneath the fetal presenting part (occult cord prolapse) such that rupture of the membranes merely
revealed the prolapse but did not cause it. The proportion of cases that are iatrogenic appears to be decreasing, but the use of a balloon catheter for cervical ripening is one modern intervention that can lead to cord prolapse by elevating the presenting part. Rapid identification and management of cord prolapse may be lifesaving for the fetus. The management steps are:

1. Diagnose the cord prolapse by visual inspection or palpation on immediate vaginal examination. The cord may be extruded from the vagina, coiled in the vagina, or wrapped across the presenting part. The only sign may be a severe variable deceleration or bradycardia after rupture of the membranes.
2. Quickly assess the fetal status via fetal heart rate (FHR) monitoring or ultrasound.
3. Assess the dilation and status of labor. In the uncommon situation where the fetus can be delivered more quickly and safely by vaginal rather than cesarean delivery, proceed immediately using forceps, vacuum, or in the case of a second twin, total breech extraction, when appropriate.
4. If immediate vaginal delivery is not feasible, prepare for cesarean delivery. Elevate the presenting part out of the pelvis to protect the cord from occlusion. This may be performed by placing a hand in the vagina and forcefully but carefully elevating the presenting part. Alternatively, some success has been achieved by filling the bladder rapidly with about 500 cc of saline solution followed by clamping of the catheter. Oxytocin should be discontinued. Tocolysis (eg, terbutaline 0.25 mg subcutaneously) is helpful if the patient is in labor and there are recurrent FHR decelerations or if cesarean delivery will be delayed. Placing the woman in a deep Trendelenburg position also is useful to add gravity to other efforts to elevate the fetus off the cord. The effectiveness of these maneuvers can be measured by monitoring the FHR. Handling of the cord should be minimized to prevent vasospasm of the umbilical arteries.
5. Do not attempt to replace the cord in the uterus.
6. Perform an emergent cesarean delivery while continuing all efforts to hold the presenting part off the cord. If a delay is encountered, wrap the cord in warm wet packs.

Prevention of cord prolapse is difficult but occasionally may be accomplished by identifying risk factors or by identifying a cord presentation by ultrasound. Artificial rupture of the membranes should not be performed when the station is high. If artificial rupture of membranes is essential to manage a difficult obstetric situation, and the head is unengaged and high, the membranes can be needled under double set-up conditions. The same procedure can be used to rupture the membranes when polyhydramnios is present.

Patients in the later stages of pregnancy who are at high risk of cord prolapse (eg, footling breech presentation, polyhydramnios) should be identified. They can be instructed to examine themselves for cord prolapse if their membranes rupture outside of a hospital. If a prolapse is identified, they should assume a deep knee-chest position and maintain the position during transport to the hospital.

Multiple Gestation

Multiple gestation occurred in 3.4% of births in the United States in 2013. The twinning rate rose 76% from 1980 to 2009 with the increase attributed to the use of fertility therapies and increased proportion of women with advanced maternal age. Twin pregnancies are 7 times more likely to result in delivery at less than 32 weeks’ estimated gestational age, and multifetal pregnancies have 5 times the risk of stillbirth compared with singleton pregnancies. Congenital anomalies, IUGR, and intrapartum complications also contribute to stillbirth. Dizygotic twins occur in approximately two-thirds of twin gestations, and increase with age, parity, and certain familial and racial circumstances. Monozygotic twins occur in one-third of twin gestations, and there are no known predisposing factors. Morbidity and mortality are higher in monozygotic twins.

Maternal complications are common in multiple gestation. These include gestational hypertension, preeclampsia, gestational diabetes, anemia, hyperemesis, abruption, placenta previa, postpartum hemorrhage, and increased assisted delivery.

Diagnosis

Multiple gestation is now routinely diagnosed by ultrasound during prenatal care in high-resource settings. The intrapartum diagnosis of the second twin occurs uncommonly but is most common when there is a lack of prenatal care. Historical and physical findings suggestive of multiple gesta-
tion and indicating an ultrasound are: uterine size larger than date, hyperemesis gravidarum, early preeclampsia, elevated maternal serum alpha fetoprotein levels, suggestive palpatory or auscultatory findings, polyhydramnios, ovulation induction, and family history of multiple gestations.

**Prenatal Management**

Several factors are more common in multiple versus singleton gestations:

**Prematurity.** Prematurity is the greatest threat to multiple gestation fetuses, and prevention of prematurity is the highest priority. Unfortunately, no preventive measures, including bed rest, routine cerclage, and tocolytic drugs, have been shown to effectively prevent preterm labor.\(^{79,80}\) Although progesterone has been shown to be beneficial in singleton pregnancies with a history of preterm birth (intramuscular weekly progesterone) and singleton pregnancies with a short cervix diagnosed between 16 and 24 weeks' gestation (vaginal progesterone), the role of progesterone in twin pregnancies remains controversial and no benefit has been shown for routine use of vaginal progesterone or intramuscular 17 alpha-hydroxyprogesterone caproate in twin pregnancies with a short cervical length.\(^{81-83}\) Intramuscular progesterone use in twin pregnancies complicated by a prior preterm delivery may be reasonable based on the singleton date, but there is no evidence to support or refute this practice.\(^{84}\)

**Congenital anomalies and developmental defects.** Compared with singleton pregnancies, the rates of congenital anomalies and developmental defects are doubled in twin pregnancies, and higher in monzygotic twins.\(^{85}\) An ultrasound including a detailed anatomic survey is recommended for all women with a multiple gestation at approximately 18 weeks' gestation. A first-trimester ultrasound may be performed to confirm or determine gestational age as part of genetic screening and to determine chorionicity.

**Preeclampsia.** Compared with singleton pregnancies, preeclampsia occurs twice as often in twin gestations.\(^{86}\) A daily low-dose aspirin (81 mg/day) taken orally starting after 12 weeks' gestation is recommended for women at risk of preeclampsia, including those with multiple gestations.\(^{87}\) Iron deficiency is common, and iron supplementation is typically indicated. Women with twin pregnancies are at greater risk of gestational diabetes, but routine screening in early pregnancy is not recommended.\(^{88,89}\)

**Growth restriction, size discordance, and twin-to-twin transfusion syndrome.** The possibility of IUGR and discordant growth requires surveillance with ultrasound for interval growth.\(^{90}\) Size discordance greater than 20% is associated with a sevenfold increase in major neonatal morbidity.\(^{91}\) Ultrasound examination every 4 weeks starting at approximately 24 weeks' gestation is recommended to assess interval growth and concordance. In pregnancies with monochorionic twins who have an increased risk of twin-to-twin transfusion syndrome, surveillance should start at approximately 16 weeks' gestation with assessment of amniotic fluid volume every 2 weeks. Intervention in the presence of significant discordance before 36 weeks' gestation or twin-to-twin transfusion syndrome is complex, and perinatal consultation is appropriate.

**Fetal mortality.** Fetal mortality, including stillbirth, is much more common in twin than singleton pregnancies and in monoamniotic/dichorionic than in diamniotic/dichorionic pregnancies. Assessing the FHR at each prenatal visit should be performed via ultrasound (or electronic fetal monitor with two FHR attachments) rather than Doppler ultrasound imaging. When stillbirth of one twin occurs, conservative management of the surviving twin is indicated, at least until 34 weeks' gestation. Surviving twins in monochorionic/diamniotic pregnancies are at risk of neurologic injury when the stillbirth occurs after 14 weeks' gestation, but early delivery is not beneficial because the injury is thought to occur before the time of diagnosis of a single twin demise. Because of the higher risk of intrauterine fetal demise, routine induction of diamniotic/dichorionic twin pregnancies at 38 weeks' gestation and monoamniotic/dichorionic at 36 to 37 weeks' gestation is commonly recommended.\(^{92,93}\)

**Placenta previa.** The incidence of placenta previa is increased in multiple gestation and should be detected by the recommended anatomic survey and/or interval growth ultrasounds.

**Intrapartum Management**

Delivery of twin pregnancies presents a range of challenges. Intrapartum complications include malpresentations, locked twins, cord prolapse, abruptio, concerning FHR tracing, dysfunctional...
Malpresentations, Malpositions, and Multiple Gestation

Labor, and postpartum hemorrhage. Several of these complications can arise from the way the twins present. Either fetus may be vertex, breech, or in a transverse lie. Theoretically, there are nine combinations of presentations of first and second twins, but for practical purposes there are three (Table 3).

Vertex-vertex presentations are the most common and least complicated. With appropriate monitoring and the ability to respond to an emergency with urgent cesarean or assisted vaginal delivery, labor can be allowed to progress to vaginal delivery of both fetuses. Oxytocin induction or augmentation, epidural analgesia, and other interventions are all acceptable, with caution. The interval between deliveries is not critical if the second fetus is doing well, but oxytocin augmentation is often used when delay is encountered between deliveries. A 2011 Cochrane review showed minimal evidence regarding optimal mode of delivery in twin pregnancies.

Based on a 2013 RCT that showed no benefit from routine cesarean delivery as long as the first twin was in vertex position and at least 32 weeks’ gestation, current recommendations are not to perform cesarean delivery for vertex-vertex twins without another indication. A physician experienced in vaginal breech delivery and breech extraction should be available for all twin vaginal deliveries because the second twin can change to a breech or transverse presentation after the delivery of the first twin.

When vaginal delivery is attempted, the time of greatest risk occurs after the delivery of the first twin, when the provider must determine the presentation of the second twin, which may be different from its presentation before the first twin was delivered. A combination of external examination, internal examination, and ultrasound may be used. Assuming the second twin is in breech presentation or a transverse lie, a decision must be made whether to attempt an ECV to vertex, deliver

### Table 3. Presentation of Twins

<table>
<thead>
<tr>
<th>Twin A</th>
<th>Twin B</th>
<th>Percentage of Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertex</td>
<td>Vertex</td>
<td>40</td>
</tr>
<tr>
<td>Vertex</td>
<td>Nonvertex</td>
<td>40 (30% breech/10% transverse)</td>
</tr>
<tr>
<td>Breech</td>
<td>Vertex/Nonvertex</td>
<td>20</td>
</tr>
</tbody>
</table>

the second twin as a vaginal breech delivery, or perform a cesarean delivery. The exact obstetric circumstances, the experience of the clinician, condition of the fetus, state of mind of the woman, and the available resources are all factors in the decision. The second twin must be carefully monitored because placental abruption and umbilical cord prolapse are obstetric emergencies that may occur between the delivery of the first and second twin.

If concerning fetal monitoring requires expeditious delivery of the second twin, then a vacuum-assisted vaginal delivery may be performed at a slightly higher station than would typically be considered for a singleton. A mid-pelvic vacuum of the second twin at 0 or +1 station is reasonable if the estimated fetal weight of the second twin is not considerably greater than the first twin.98 The delivery of twins is best accomplished in the operating room, in case a rapid cesarean delivery is needed. Anesthesia should be on standby.

When the first twin is vertex but the second is nonvertex, the optimal mode of delivery has been controversial. Some clinicians advocate for cesarean delivery, but if a physician experienced in internal podalic version and vaginal breech delivery of the second twin is available, routine cesarean delivery is not necessary.97 Vaginal breech delivery of the second twin is reasonable for a fetus with an estimated weight greater than 1,500 g (3.3 lb), greater than 32 weeks’ gestation and if criteria are met for vaginal delivery of a singleton fetus in breech presentation as discussed previously.97

When the second twin is presenting in a transverse or oblique presentation or as a footling breech, then a breech extraction can be performed.99 The clinician will identify and grasp the feet without rupturing the second gestational sac and bring the feet down to the vagina. Abdominal ultrasound to determine the location of the feet can be helpful. The delivering clinician’s second hand or an assistant can apply gentle abdominal pressure to help guide the fetal head upward into the uterine fundus. With the clinician exerting steady downward traction on the feet to maintain the breech as the presenting part, the membranes are then ruptured. After delivery of the umbilicus, the delivery of the arms and head is similar to other vaginal breech deliveries.

Breech extraction of the second twin may also occur as part of an internal podalic version in which the vertex is elevated out of the pelvis before reaching for the feet. Breech extraction and internal podalic version should not be attempted unless the clinician has training and experience. This is perhaps the most difficult and dangerous procedure permissible in modern obstetrics. Breech extraction and podalic version should be performed only if the estimated fetal weight of the second twin is not substantially greater (eg, 20%) than the first.97,99 The use of a model to simulate internal podalic version or breech extraction to deliver the second twin has been developed and the cited reference includes links to videos demonstrating the simulations.100

Undiagnosed twins are rare in areas where ultrasound is frequently used. In the pre-ultrasound era, as many as 50% of twin gestations were unsuspected until delivery. When ultrasound has not been performed, birth attendants should always be alert to this possibility. If a nonvertex second twin unexpectedly presents in a setting without an experienced clinician because of an undiagnosed second twin or no prenatal care, options include ECV (as previously discussed) or cesarean delivery.

Situations mandating cesarean delivery for a twin gestation include cord prolapse, abruption, clinician inability to reach the feet to perform internal podalic version, and breech extraction of a fetus in a transverse lie. A contributing problem occurs when the cervix closes after the first twin is delivered. These situations can arise suddenly, so resources for immediate cesarean delivery should be available. When the first twin is in nonvertex position, cesarean delivery should be expedited until delivery. When ultrasound has not been performed, birth attendants should always be alert to this possibility. If a nonvertex second twin unexpectedly presents in a setting without an experienced clinician because of an undiagnosed second twin or no prenatal care, options include ECV (as previously discussed) or cesarean delivery.

Cesarean delivery in women with multiple gestation presents anesthetic and surgical challenges because of the enlarged uterus, the exaggerated physiologic response to pregnancy, and the potential for unusual presentations of the fetuses.
The necessity for a vertical incision in both the skin and uterus is a special consideration when the twins are in unusual or entwined positions. Conjoining of twins is a rare condition and is beyond the scope of this chapter but should be considered if ultrasound shows twins in a face-to-face or back-to-back position.

After delivery, postpartum hemorrhage is relatively common because of the overdistension of the uterus. Clinicians should be fully prepared with IV access, proper oxytocic drugs, and blood products. Neonatal resuscitation is often required because of prematurity or the many potential complications of multiple gestation. Frequently, two infants and the woman need treatment simultaneously. Adequate personnel and equipment must be available.

Global Perspective
The diagnosis, management, and perinatal outcomes of pregnancies complicated by malpresentation in low-resource settings will be strongly influenced by the availability of obstetric ultrasound and urgent cesarean delivery. A greater proportion of fetuses in breech presentation will be delivered vaginally when the diagnosis is delayed because of the lack of access to ultrasound and time to initiate a cesarean delivery can be lengthy. In the TBT, 9.6% of women assigned to the elective cesarean delivery group had vaginal deliveries.51 The safest route for breech deliveries is not as clear for developing countries, as the TBT showed that the reduction in adverse perinatal outcomes was less pronounced and did not reach statistical significance in countries where the perinatal mortality rate was greater than 20 per 1,000.51

A 2015 Cochrane review showed that early ultrasound significantly decreases the number of post-date pregnancies and undiagnosed twins.102 In settings where routine obstetric ultrasound is uncommon, a higher proportion of twin pregnancies may be diagnosed in the third trimester or even after delivery of the first twin. For these reasons, skills in delivery of fetuses in breech presentation and nonsurgical maneuvers (eg, ECV, internal podalic version, manual rotation from OP position) are essential in low-resource settings.102 Transverse lie of a dead fetus is a life-threatening complication for women in developing countries and almost unheard of in high-resource settings. Emergent treatment may require destructive delivery, internal podalic version, or laparotomy.

Summary
There are six types of malpositions or malpresentations. Some are common (OP position, breech presentation) and some are rare (transverse lie, brow presentation, face presentation, compound presentation). Diagnosis is made by physical examination and imaging. A high index of suspicion for malpositions and malpresentations is helpful in making the diagnosis. Each variation in position or presentation has its own potential complications. Clinicians should be alert not only to complications resulting from labor and delivery, but also problems that may be causative of the malpresentation.

Vaginal delivery may be considered for four of these presentations: OP, frank breech, mentum anterior position, and compound. With OP position, the clinician has several management choices for delivery. With breech presentation, complex criteria determine if vaginal delivery can occur safely. ECV should be offered for nonvertex presentation at 37 weeks’ gestation or greater. A high degree of technical skill and judgment is required to safely deliver fetuses with malpresentations. Multiple gestation presents a wide variety of special challenges to the clinician. If the first twin is in vertex presentation, then vaginal delivery is usually the recommended mode of delivery.

Nursing Considerations:
Malpresentations, Malpositions, and Multiple Gestation

- Determine the location of ultrasound equipment every shift and learn how to turn it on
- Identify patients at risk of malpresentations and malpositions
- Apply evidence to advocate for the option of regional anesthesia in selected patients undergoing external cephalic version
- During an emergency breech vaginal delivery, consider positioning the woman at the edge of the bed, establishing intravenous access, and identifying your institution’s location of and administration process for nitroglycerin
- During a cord prolapse, consider changing the maternal position and hold the presenting part off of the cord as appropriate. If entering the vagina, do not remove your hand from position until indicated by delivery
- Validate distinct fetal heart rates for multiple gestation
Malpresentations, Malpositions, and Multiple Gestation

References


52. Impey LWM, Murphy DJ, Griffiths M. Management of Breech Presentation: Green-top Guideline No. 20b. *BJOG.* 2017;124(7):e51-e77.


78. Glinianaia SV, Obeysekera MA, Sturgiss S, Bell R. Stillbirth and 
neonatal mortality in monochorionic and dichorionic twins: a popu-

79. Hofmeyr GJ, Hannah M, Lawrie TA. Planned caesarean section 
for term breech delivery. Cochrane Database Syst Rev. 2015;7(7): 
CD00166.

80. Rafael TJ, Berghella V, Alfirevic Z. Cervical stitch (cerclage) for 
preventing preterm birth in multiple pregnancy. Cochrane Database 

the prevention of preterm birth in twin gestations: a randomized 
213(1):82.e1-82.e9.

82. Senat MV, Porcher R, Winer N, et al; Groupe de Recherche en 
Obstétrique et Gynécologie. Prevention of preterm delivery by 17 
alpha-hydroxyprogesterone caproate in asymptomatic twin preg-
nancies with a short cervix: a randomized controlled trial. Am J 

83. Hofmeyr GJ, Barrett JF, Crowther CA. Planned caesarean section 
for women with a twin pregnancy. Cochrane Database Syst Rev. 
2011;12):CD006553.

84. Collins A, Shennan A. A clinical opinion on how to manage the risk 
of preterm birth in twins based on literature review. J Matern Fetal 

85. Glinianaia SV, Rankin J, Wright C. Congenital anomalies in twins: 

86. Day MC, Barton JR, O'Brien JM, et al. The effect of fetal number on 
the development of hypertensive conditions of pregnancy. Obstet 
Gynecol. 2005;106(5 Pt 1):927-931.

87. Lefevre ML; U.S. Preventive Services Task Force. Low-dose aspirin 
use for the prevention of morbidity and mortality from preclampsia: 
U.S. Preventive Services Task Force recommendation state-

88. Committee on Practice Bulletins—Obstetrics. ACOG Practice Bul-
etin no. 190: Gestational Diabetes Mellitus. Obstet Gynecol. 2018; 
131(2):e49-e64.

89. Rauh-Hain JA, Rana S, Tamez H, et al. Risk for developing ges-
tational diabetes in women with twin pregnancies. J Matern Fetal 

90. Cleary-Goldman J, D’Alton ME. Growth abnormalities and multiple 

determinant of outcome in preterm discordant twins. Obstet Gyne-

92. Spong CY, Mercer BM, D’alton M, et al. Timing of indicated late-pre-

93. Committee on Practice Bulletins—Obstetrics; Society for Maternal– 
Fetal Medicine. Practice Bulletin no. 169: Multifetal Gestations: Twin, 

94. Cruikshank DP. Intrapartum management of twin gestations. Obstet 

95. Rossi AC, Mullin PM, Chmait RH. Neonatal outcomes of twins 
according to birth order, presentation and mode of delivery: a sys-

96. Hofmeyr GJ, Barrett JF, Crowther CA. Planned caesarean section 
for term breech delivery. Cochrane Database Syst Rev. 
2011;7):CD006553.

97. Barrett JF, Hannah ME, Hutton EK, et al; Twin Birth Study Collabora-
tive Group. A randomized trial of planned cesarean or vaginal deliv-

98. Vacca A. Handbook of Vacuum Delivery in Obstetric Practice. 3rd 

99. Fox NS, Silverstein M, Bender S, et al. Active second-stage man-
gement in twin pregnancies undergoing planned vaginal delivery 

100. Cornette JM, Erkamp JS. Internal Podalic Version and Breech 
Extraction: Enhancing Realistic Sensations in a Simulation Model. 

a description of external cephalic version in noncephalic presenting 

102. Whitworth M, Bricker L, Mullan C. Ultrasound for fetal assess-
ment in early pregnancy. Cochrane Database Syst Rev. 2015;7(7): 
CD007058.