

Holistic Midwifery Vol. II, pp. 76-96

The term “cardinal movements” refers to the seven principal movements that the baby navigates his way through his mother’s pelvis during the labor and birthing process. It is important to note that each mother’s body and each baby combine to create unique circumstances that influence the way the baby moves during labor. Therefore, the following steps may look different for each delivery. In addition, Anne Frye differs from other sources (a couple being the other articles from this lesson) in what she says the order of the first three cardinal movements are. They may occur simultaneously or subsequently.

Descent:

During this movement, the baby’s presenting part (and ultimately body) settles lower in the mother’s pelvis and continues to descend past the pelvic brim to the outlet and eventually throughout normal labor as the baby maneuvers his way through the rest of the birth canal. It refers to both a specific event and a continual process during labor. Descent can begin to occur before labor begins, sometimes even a couple weeks before. This happens most commonly with mothers who are having their first baby (primiparas). This is referred to as “lightening.” Lay people might call this “dropping.” Descent usually begins later in multiparas (women who have had multiple children before) when the cervix is dilated. In labor, descent occurs due to the combination of downward pressure from uterine contractions, the dilation and retraction of the cervix over the baby’s presenting part (usually the head) the stretching and relaxation of the mother’s soft pelvic tissues, the mother’s pushing efforts and, to a lesser extent, gravity. The baby’s involvement during descent includes his extension and straightening of his body and is critical to the smooth progression of labor. Further cardinal movements cannot happen if the baby is not descending through the birth canal. When descent begins, the baby’s presenting part (usually the suboccipitobregmatic diameter of the baby’s head) is at the level of the pelvic brim and is pushed deep into the pelvis in a sideways or transverse position (in the majority of cases), with the face to the mother’s left and the occiput (back of the baby’s head) to the mother’s right.

Flexion:

Flexion refers to the degree to which the baby’s head is tucked against his chest. It also refers to the flexion of the baby’s spine during labor, although to a lesser degree. The baby’s head, neck, and spine work together, tending to curl forward as labor draws near. This

positioning is helped by the mother's own extreme spinal curve (lordosis) that develops during pregnancy. As the baby's head descends and experiences pressure from the cervix and the shape of his mother's pelvic bones and soft tissues, the chin becomes flexed to come into contact with his sternum. When the head is completely flexed, the presenting diameter changes from the occipitofrontal (which is 11.0 cm, the typical diameter of engagement) to the smaller and rounder suboccipitobregmatic diameter, which is 9.5 cm. Obviously, this reduces the presenting diameter by 1.5 cm or more, causing the axis of the verticomental diameter (the greatest distance from the vertex of the fetal skull to a point just below the prominence of the chin) to be directed straight down, parallel with the pelvic passage. This makes passage through the birth canal much easier and faster than if the head was extended rather than flexed. Although the head is typically not well-flexed when it rests above the brim during late pregnancy, it generally becomes progressively more flexed as the baby descends further into the birth canal, especially once internal rotation begins or when the head reaches the sacral tip. The most important fetal landmarks during flexion include the occiput, the suboccipitobregmatic diameter (from the base to the top of the baby's skull), the occipitofrontal diameter (from occipital protuberance to the forehead), and the posterior fontanel (which should be leading the way).

Engagement:

This movement occurs when the presenting part is at the level of the ischial spines or at a zero (0) station. Before this time, it is referred to as "floating." More specifically, engagement describes the descent of the biparietal diameter (from distance between the sides or two parietal bones of the skull), the widest portion of the fetal skull, through the pelvic inlet. Although engagement is considered to be one of the cardinal movements of birth, it actually occurs prior to labor in some mothers. The baby's head typically drops to the level of the ischial spines in the occiput transverse position, which means that his face is directed toward his mother's one side while the back of his head faces her other side. This (usually) occurs regardless of the position of the body, and is due to the fact that most pelvic brims are wider side to side, which encourages the baby's head to assume this positioning and allows for more room for the baby's head to descend. Furthermore, babies favor an occiput transverse position because it enables them to take advantage of asynclitic engagement (entering the brim at a slight angle), which helps their heads to wiggle under the mother's symphysis (pubic bone) as he descends and rotates internally. Engagement causes the baby's head to rest more firmly on the cervix and soft pelvic tissues, which helps to further dilation, softening, and stretching. In some cases, engagement, flexion, and descent can occur all simultaneously. Complete flexion enables the baby to rotate his head

to the occiput anterior position (with the back of the head facing the mother's front), which is part of one of the next cardinal movements.

Major fetal landmarks include the biparietal diameter, while the mother's major landmark is the ischial spines, or zero station.

Internal Rotation:

During internal rotation, the baby's head rotates 90 degrees from the occiput transverse position to the anteroposterior position. This is facilitated primarily by the shape of the head as it descends and adapts to the resistance offered by the walls of the dilating soft tissues of the birth canal, especially the strong and resistant sidewalls of the loop-shaped opening of the pubococcygeus muscle, which is the first of the levator ani muscles that the descending part encounters. It leads the baby's internal rotation. The rest of the levator muscles form a forward-slanting sling that cradles and guides the head once rotation is complete. When internal rotation occurs can vary greatly among women. First time mothers typically experience internal rotation when the baby is just above the bend in the birth canal (from -3 to 0 station) or as the head enters the upper portion of the most curved portion of the birth canal (just below the level of the ischial spines, about +1 station). In multiparas, internal rotation occurs more unpredictably. It tends to occur at a lower level in the pelvis because the levator ani muscles have been stretched, which means that they offer less counterpressure against the baby's presenting part. Most of the time, internal rotation comes after cervical dilation is complete. Prior to full dilation, rotation may be encouraged by the resistance of a partially dilated cervix, which mimics the resistance of the pelvic floor. The engagement of the baby's head and the progressive descent of the baby are important to helping internal rotation occur. As the head rotates to fit the different diameter of the pelvic cavity (more round, and spacious in the anteroposterior diameter), it leads the shoulders and the rest of the body in a downward spiraling motion. This leads to the next cardinal movement as the baby's head and body must now extend under the pubic bone to be born.

Extension:

During this movement, the baby's head, neck, and spine begin to extend as his previously flexed head slips out from under the pubic bone. The baby is forced to extend his head so that the head is born pushing upward out of the vaginal canal. The natural curve of the lower pelvis and the baby's head being pushed outward forces distention of the perineum and vagina. As it moves through the vaginal canal, the chin lifts up (extends) and the head is delivered. During this maneuver, the fetal spine is no longer flexed, but extends to accommodate the body to the contour of the birth canal. This occurs as the mother nears

the end of labor when the baby is near the level of the tuberosities (around +4 or +5 station). His head rocks back and forth as the perineum stretches and both the powerful uterus and the mother actively push the baby through the birth canal. Once the biparietal diameter (the widest part) passes through the vaginal opening, the soft tissues around the baby's head retract, the neck lengthens, and the head is born. As the perineum retracts, it sweeps posteriorly over the baby's vertex, bregma, forehead, brows, nose, chin, and mouth, and anteriorly over the occiput. The flexed head crowns and is born during this cardinal movement by the extension of the lower neck and upper spine.

External Rotation:

This cardinal movement is also called "restitution of the head" and refers to what happens after the baby's head has been completely born. After it is born, and the vaginal tissues are no longer exerting any pressure upon it, the head repositions itself back into its original anatomical orientation that it entered the pelvis with, at a right angle with its shoulders. The neck untwists, causing the head to return or restitute 45 degrees to an oblique angle (OA or LOA positions are most common) and leading the shoulders in an internal rotation. This occurs primarily because the shoulders fit the best in the anteroposterior diameter of the pelvic outlet. This step could not happen at any other time because there was no need to rotate this way before, and the pressures of the birth canal kept the baby in the necessary positions to maneuver through the other parts of the birth canal. The major fetal landmarks during the cardinal movement include the baby's shoulders and head. If the shoulders become lodged behind the mother's pubic bone and the birth attendant cannot get the baby out quickly enough, the baby could suffocate and die. The major maternal landmarks are the perineum, vaginal opening, vulva, and pubic bone.

Expulsion:

Once the head restitutes, leading the rotation of the shoulders, one shoulder will generally drop down and be born first. The anterior shoulder (the one facing the mother's front) must pivot and maneuver under the mother's pubic bone, while the posterior or back-facing shoulder bulges the perineum and slides out. Sources differ on whether the anterior or posterior shoulder is typically born first. Regardless, once the anterior shoulder slips under the symphysis pubis (the mother's pubic bone), there is no longer any obstacle holding the rest of the baby's body back. Therefore, the body quickly and passively slides out of the birth canal and is born in a downward, spiraling motion facilitated by fundal pressure and a uterine contraction. Sometimes, the fundus pushes the baby so forcefully that he "shoots" out extremely fast. This is called the "fetal ejection reflex." Since this is the very last cardinal movement, all the other movements that the baby has made throughout the birthing

process have been working to enable this one. Without flexion, descent, engagement, internal rotation, extension, and external rotation, expulsion i.e. the vaginal birth of the baby would not have been possible. The major landmarks during this cardinal movement include the baby's shoulders and the mother's symphysis pubis.