

# Intrapartum Care: Normal and Abnormal Labor, Operative Delivery and Shoulder Dystocia

[See online here](#)

**Stage 2 of labor is the part of the normal labor process that begins with full dilation of the maternal cervix and ends with the delivery of the infant. The second stage of labor has a variable length of time. In multiparous women, it can be as short as a couple of minutes. In primiparous women, this stage of labor can last from twenty minutes to two hours. The contractions will last longer, up to 90 seconds per contraction and will be about three to five minutes apart.**



## Definition of the Second Stage of Labor

The second stage of labor is defined as that part of a normal labor process that begins with **complete dilatation of the cervix** and ends with the **delivery of the infant**.

This stage is monitored via evaluation of descent of the fetal head that is expressed in relation to the ischial bones (station). Station 0 represents head at the level of the ischial spines, negative station represents the head above the ischial spines and positive station indicates the head below the ischial spines.

# Mechanisms of the Second Stage of Labor

In this stage of labor where the fetus goes through the **cardinal stages of movement**. In the vertex presentation it entails:

## Engagement into the pelvic inlet

The fetal head needs to engage in the pelvic inlet in an occiput-transverse position in 70% of females. Occurs 2 weeks prior to the term in primigravids and just before delivery in multiparous women.

## Flexion

Allows the sub-occipital-bregmatic diameter to be the presenting diameter.

## Descent

Slowly progressive down the pelvis under the influence of the forces of uterine contraction. It continues until the fetus is delivered.

## Internal rotation

With descent into the mid-pelvis, internal rotation must occur to allow for the sagittal suture to occupy the anteroposterior diameter of the pelvis.

The vaginal outlet is located upwards and forwards in relation to the rest of the pelvis thus, the extension must occur for the head to pass through and allow for crowning.

## External rotation/restitution.

Due to the delivery of the head and assumption of the fetus position at engagement external rotation is needed for delivery of the shoulders.

## Expulsion

Once the shoulders are safely delivered the infant is generally easy to expel in this last stage.

A total of 70 % of pregnancies end with vaginal delivery. Some women have planned cesarean sections due to indications that preclude labor and delivery, while others have labor complications, usually in the first stage of labor that result in an emergency cesarean section.

**Emergency cesarean sections** can happen in the second stage of labor if the woman has become exhausted or the fetal presenting part arrests at some point in the second stage of labor with failure of vacuum extraction or forceps operative delivery.

## Symptoms and Signs of the Second Labor Stage

In the second stage of labor, the woman has **contractions that are three minutes apart, lasting about 90 seconds** in duration. Most women feel extreme rectal pressure and feel a strong urge to defecate. This is because the fetal head has descended and is pressing on rectal tissues, sending a signal to push.

Women with a high station at the time of full cervical dilation often don't feel the urge to push yet but must be coaxed to push until the head descends further in the birth canal.

During this stage of labor, the mother continues to be monitored using a **tocodynamometer** to measure contractions or an **internal pressure catheter**, which measures intrauterine pressure.

Contractions are much closer together in the second stage of labor when compared to the first stage of labor. The **fetal heart rate** may be monitored externally or through an internal scalp electrode. Early decelerations are common as these are caused by head pressure, which is ongoing through the first part of the second stage of labor. There can be cord compression at this stage, resulting in variable decelerations; however, changes in the mother's position can often alleviate these.

## Special Tests in the Second Stage of Labor

Monitoring of the **fetal heart rate** is done throughout the second stage of labor. By this time, the **fetal heart tones** may be difficult to pick up externally so a fetal scalp electrode can be placed on the fetal head to monitor the heart tones until delivery.

If there is a prolonged second stage of labor or suspicion of fetal distress, **fetal scalp stimulation** can be done, in which the fetus's scalp is pushed on with a gloved hand and rubbed for a few seconds. If the fetal heart rate increases by fifteen beats per minute after scalp stimulation, the fetus is likely not in distress.

If there is a further concern, **fetal scalp blood sampling** can be done. A lancet is used to get a sample of blood from the fetal scalp and is tested for pH and lactate levels. If the pH is low and the lactate level is high, this indicates **acidosis** in the infant and is an indication for immediate delivery by operative means.

## Treatment of abnormalities in the Second Stage of Labor

Most women in the second stage of labor require no particular intervention as long as the fetal head continues to descend through the birth canal and there is no evidence of fetal distress or maternal fatigue. If the second stage of labor lasts longer than two hours or fetal distress is suspected, an **operative delivery** may be entertained.

### Criteria to perform an operative vaginal delivery

- Knowledge of fetal position
- At least +2 station
- Cervix fully dilated
- Adequate anesthesia

**There are three types of operative delivery that can be done in the second stage of**

#### **Vacuum extraction**

- It involves placement of a soft plastic cup over the fetus's head and suction is applied so the cup is attached firmly to the scalp. During a contraction, the doctor or midwife pulls on the cup to aid in the descent of the head.

- The major complications of a vacuum-assisted operative delivery include a cephalhematoma from excess suction on the fetal scalp, a scalp laceration, or, more rarely, an intracranial bleed from an excessive force applied to the head.



**Image:** "Bruising and deformation of the scalp caused by vacuum extraction. Child's scalp was fine in a week." by User:Ravedave - Own work. License: [CC BY 2.5](https://creativecommons.org/licenses/by/2.5/)

### **Forceps-assisted vaginal delivery.**

- The second type of operative delivery is **forceps-assisted vaginal delivery**. There are numerous types of forceps that can be used and the doctor generally chooses the forceps type he or she is most familiar with using.
- The forceps device has two halves and one half is placed on one side of the fetal head, while the other half is placed on the other side of the fetal head. The two halves are connected and, during a contraction, the device is pulled on to assist in the descent of the fetal head.
- In forceps-assisted deliveries, there needs to be adequate analgesia of the perineum and birth canal. This requires a pudendal block or epidural anesthesia.
- Complications of a forceps delivery include [intracranial hemorrhage](#), skull fracture, facial nerve injury, or facial laceration if the forceps device is incorrectly placed.



**Image:** "Das's modification to the long curved delivery forceps (shorter in length) with axis traction devices in place, seen from the right side (left blade on top: with respect to the mother's vaginal wall)." by Sarindam7 - Own work. License: [GFDL](https://creativecommons.org/licenses/by-sa/4.0/)

## Cesarean section

- The third type of operative intervention in the second stage of labor is the **cesarean section**. This is done for fetal distress in the second stage that can't be managed with imminent vaginal delivery or failure to progress in labor after a trial of at least two hours.
- If the doctor is uncomfortable with vacuum extraction or forceps-assisted delivery, or if this is attempted and fails, a cesarean section is performed. The woman is generally given a spinal block for total anesthesia of the lower half of the body or general anesthesia if the delivery needs to be emergent. Transverse cesarean sections are the most common and provide the best cosmetic outcome after a cesarean section.

## Indications for cesarean section

- Fetal intolerance of labor
- Arrest of dilation or descent on labor
- [Malpresentation](#)
- Placental abnormalities
- Previous uterine surgery

## Possible Complications in the Second Stage of Labor

The major complication of the second stage of labor is a **failure to progress** in the second stage. This means that the fetal head is unable to engage in the pelvis or becomes stuck in the birth canal with an inability to progress any further even with vacuum-extracted assistance or with the use of forceps. There may be **fetal distress** or **fetal acidosis** detected on fetal scalp blood sampling, indicating the need for operative intervention with cesarean section.

## Shoulder dystocia

Shoulder dystocia can be another complication of the second stage of labor. Shoulder dystocia happens when the anterior shoulder becomes impacted against the pubic bone, preventing delivery of the shoulder after the head has been delivered. It is seen in 0.6—1.4 % of deliveries with up to 20 % of the neonates suffering brachial plexus injuries.

### **Things that predict shoulder dystocia include:**

- Prior history of shoulder dystocia
- Prolonged second stage of labor
- Fetal macrosomia
- [Gestational diabetes](#) in the mother
- Maternal obesity.

### **Shoulder dystocias are unpredictable so you should always be prepared!**

If the infant's head retracts after a contraction while the head is at the perineum, this is called a "**Turtle sign**" and should indicate the possibility that the shoulders are impacted.

### **There are things that can be done to continue a vaginal delivery when shoulder dystocia is present, and they include:**

- Gentle inferior traction of the head.
- An **episiotomy** is necessary as the birth canal needs to be as wide as possible and the cause is most likely soft tissue dystocia.
- The mother can be instructed to bring her knees up as close to her head as possible. This is called the **McRoberts position** and can facilitate the delivery of the anterior shoulder.
- If this fails, the doctor can enter the posterior aspect of the birth canal and free the posterior shoulder first, giving room for the secondary delivery of the anterior shoulder.
- In rare cases, the clavicle on the anterior shoulder can be intentionally fractured to allow for passage of the anterior shoulder.
- Sometimes, **pressure on the pubic area** can bring the anterior shoulder down. The woman can also be rotated so that she is on her hands and knees. The posterior shoulder is then delivered first, followed by the anterior shoulder.

### HELPERR

- Call for **Help**
- Consider an **Episiotomy**
- Lower the head of the bed and elevate the **Legs** / McRoberts maneuver.
- Provide suprapubic **Pressure**
- **Enter** the vagina for internal rotation
- **Relieve** the posterior arm/ **Rupture** the clavicle/ **Return** the head into the vagina (Zavanelli maneuver).

### Common complications of shoulder dystocia

The major complication of shoulder dystocia is a fracture of the infant's clavicle and significant perineal lacerations or a fourth-degree tear of the episiotomy. **Others are:**

- Brachial plexus injury
- Humerus fracture
- Asphyxia
- Contusions and lacerations

## Prognosis of the Second Stage of Labor

Most women who have had a successful vaginal delivery in the past will have an uncomplicated second stage of labor that may be precipitous as the soft tissues of the birth canal have been stretched in a previous delivery.

Primiparous women tend to have a longer second stage of labor as the soft tissues of the birth canal and perineum have never expanded previously. Even so, most women deliver vaginally without complication, although the second stage of labor may last up to two hours.

The prognosis for a vaginal delivery declines after two hours as this generally means there is an arrest of labor due to failure of the presenting part to descend through the birth canal. This is grounds for an operative vaginal delivery or cesarean section.

## References

[Stages Of Childbirth: Stage II](#) via americanpregnancy.org

Patel RR, et al. Forceps delivery in modern obstetric practice. BMJ. (2004 May 29);

328(7451).

Ali UA, et al. Vacuum-Assisted Vaginal Delivery. Rev Obstet Gynecol. 2009 Winter; 2(1): 5-17.

Clark SL, Gimovsky ML, Miller FC. The scalp stimulation test: A clinical alternative to fetal scalp blood sampling. Am J Obstet Gynecol. (1984);148:274-7.

Operative vaginal delivery. Practice Bulletin No. 154. American College of Obstetricians and Gynecologists. Obstet Gynecol. (2015); 126:e56-65.

**Legal Note:** Unless otherwise stated, all rights reserved by Lecturio GmbH. For further legal regulations see our [legal information page](#).

Notes