https://www.ncbi.nlm.nih.gov/books/NBK539820/
Pillarisetty LS, Bragg BN. Late Decelerations. [Updated 2023 Jan 30]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK539820/

Late decelerations are a serious fetal heart rate abnormality during labor, linked to uteroplacental insufficiency.
Causes include maternal dehydration, anemia, hypotension, placental abruption.

Pathophysiology: Uterine contraction constricts the blood vessels in the wall of the uterus which decreases blood flow through the placenta, reducing the diffusion of oxygen into fetal capillaries causing decreased fetal oxygen. When fetal oxygen decreases, chemoreceptors initiate an autonomic response in the fetus causing intense vasoconstriction with increased blood pressure. The elevated blood pressure is interpreted by the baroreceptors causing the parasympathetic system to decrease the fetal heart rate, causing late deceleration. The whole process reverses after the contraction is completed, with a relaxation of the uterine muscles allowing for increased blood flow to the placenta and resulting in the fetal heart rate returning to normal.

Definition: A late deceleration typically follows a uterine contraction meaning, the onset, nadir and the return of the deceleration will follow the onset, peak, and the return of a uterine contraction. It will start AFTER the start of the contraction as opposed to early which occurs at the same time as the contraction.

Classification of Fetal Heart Rate Tracings:

- **Category I**: Normal, no late or variable decelerations.
- **Category II**: Any HR that is not a category 1 or category 2
- **Category III**: Abnormal, with absent variability and recurrent late decelerations. This type of tracing requires immediate intervention.

Management:

- **Goal**: Correct underlying cause, increase uteroplacental blood flow, and prevent fetal acidemia.
- Interventions:
    - Maternal repositioning (e.g., left lateral position) to improve blood flow.
    - Intravenous hydration to correct maternal hypotension.
    - Supplemental oxygen (evidence is mixed, but commonly administered).
    - Discontinuation of uterotonics (oxytocin) or use of tocolytics to relax the uterus and improve blood flow.
    - Expedited delivery if no improvement after resuscitative measures.

Complications:

- Persistent late decelerations with minimal or no variability can lead to fetal acidemia, low APGAR scores, and neurological issues (e.g., cerebral palsy) due to cerebral anoxia.