- **Oxytocics include the following:**

  - **Oxytocin:**
    - It is an endogenous product produced by the hypothalamus and stored in the posterior pituitary gland (neurohypophysis).
    - It has an important role in labor and milk ejection.
    - As pregnancy progresses, expression of oxytocin receptors is increased in the myometrium under the influence of increased level of estrogen.
    - **Oxytocin is administered as:**
      - IV (for initiation and augmentation of labor).
      - IM (to stop post-partum hemorrhage).
    - Oxytocin has a short half life ($t_{1/2}$) of 5 minutes and it is eliminated by liver and kidneys.
    - Oxytocin receptors are G protein-coupled receptors enhancing uterine contractions and the release of prostaglandins.
    - Different doses express different effects:
      - Small dose: increase the frequency and force of contractions.
      - High dose: sustained powerful contractions with less phase of relaxation.
    - **Therapeutic uses of oxytocin:**
      - Induction of labor.
      - Augmentation of labor.
      - Control of post-partum hemorrhage.
    - **Oxytocin challenge test:** when the uterus contracts, placental perfusion will be reduced and thus supply to the fetus will decrease. This reduction can be severe enough to harm the continuation of pregnancy.
    - **Toxicities:**
      - Excessive uterine contractions might cause fetal distress, placental abruption or uterine rupture.
      - High doses might also cause activation of vasopressin receptors and sudden hypotension.
    - **Contraindications:**
      - Fetal distress.
      - Prematurity.
      - Cephalopelvic disproportion.

  - **Ergometrine:**
    - Ergot is produced by a fungus that grows on grains → causing severe arterial vasoconstriction and death when consumed by humans in high quantities.
    - **Symptoms include:**
      - Gangrene.
      - Abortion of a pregnant lady.
    - **Small and high doses:** effects are similar to oxytocin but very quickly contraction become sustained and prolonged. For this reason, it is not used for induction of labor because a doctor will not know if he reached a dose that will cause sustained contractions (and this is considered to be dangerous). Therefore, this drug is used to control post-partum hemorrhage by causing contraction of uterine smooth muscles and blood vessels (vasospasm).
    - **Side effects include:**
      - Nausea and vomiting.
      - Abdominal pain and diarrhea.
      - Headaches.
      - Chest pain and palpitations.
      - Bradycardia.
- Hypertension.
- Arrhythmias.
- Gangrene and hallucination (in case of overdose).

✓ Contraindications:
- Pregnancy.
- Vascular disease.
- Psychosis.

- Prostaglandins:
  ✓ PGE<sub>1</sub>, PGE<sub>2</sub> and PGF<sub>2α</sub> are often used with oxytocin for induction of labor and abortion. They aid in cervical relaxation.

  - Tocolytics include the following:
    - β<sub>2</sub>-agonists: such as ritodrine and terbutaline.
    - Magnesium sulphate.
    - Ca<sup>2+</sup>-channel blockers: such as nifedipine and nicardipine.
    - NSAIDs: such as indomethacin.
    - Oxytocin receptor antagonists: such as atosiban.

Note: these drugs are used to stop contractions in pre-term labor or at most delay it for a days or two. Steroids can be administered to the fetus to aid in the maturation of lungs during this period.