Developing Process of Regular Labor Contraction

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Methods and Results

The electrical oscillation developed in a positive feed-back loop composed of an amplifier, of which output is fed back to the input of amplifier through the feed-back loop, of which time constant determines output wave frequency. Signal amplitude is limited by the saturation of amplifier system, then constant amplitude of constant frequency signal is produced after the saturation of the feed-back system.

Figure 1: Uterine contractions are close to electric oscillation. A: Uterine contraction, Caldeyro-Barcia, 1960 [1]. B: Electric oscillation, 2MHz ultrasound, 1975.

The labor will be initiated by local and weak uterine contraction, which is distributed whole uterus through the gap junction, the contraction signal is conducted hypothalamus through the uterus-brain nerve [2-5] which amplifies the signal then the hypophysis
is stimulated to discharge oxytocin, which further stimulates uterine contraction, and the positive feed-back loop is further stimulated to saturate uterine contraction to constant intensity and frequency, that is the physiologic oscillation (Figure 2).

![Diagram](https://example.com/diagram.png)

**Figure 2:** Regular labor is physiologic oscillation caused by positive feed-back through uterus.

### Discussion

Braxton-Hicks contraction is after 30 weeks of pregnancy, while it does not proceed to the vaginal delivery, is an example of incomplete uterine oscillation, namely, local early contraction appears, while the positive feed-back system does not work to make the contraction to regular labor contraction. That should be discussed in the treatment of preterm labor. Tocolysis is common in the preterm labor, while it is unable to stop the contraction to prolong the pregnancy to full-term delivery. The author thinks that the preterm labor is a complete uterine oscillation, which is difficult to stop with common tocolysis. Therefore, it will be necessary to suppress the formation of positive feed-back loop with any anesthesia of uterus-brain nerve, or to detect local uterine contraction and suppress it by tocolysis, and so on, namely, more early stage suppression will be effective, after detection of the early weak contraction and tocolyzer is administered.

### Conclusion

Labor contraction of uterus is developed by a positive feed-back system including brain until physiologic oscillation. As preterm labor contraction develops by the same process, preterm labor treatment will be started from the understanding of the oscillation of positive feed-back system.

### References