

Cervical Ripening

who, why, how?

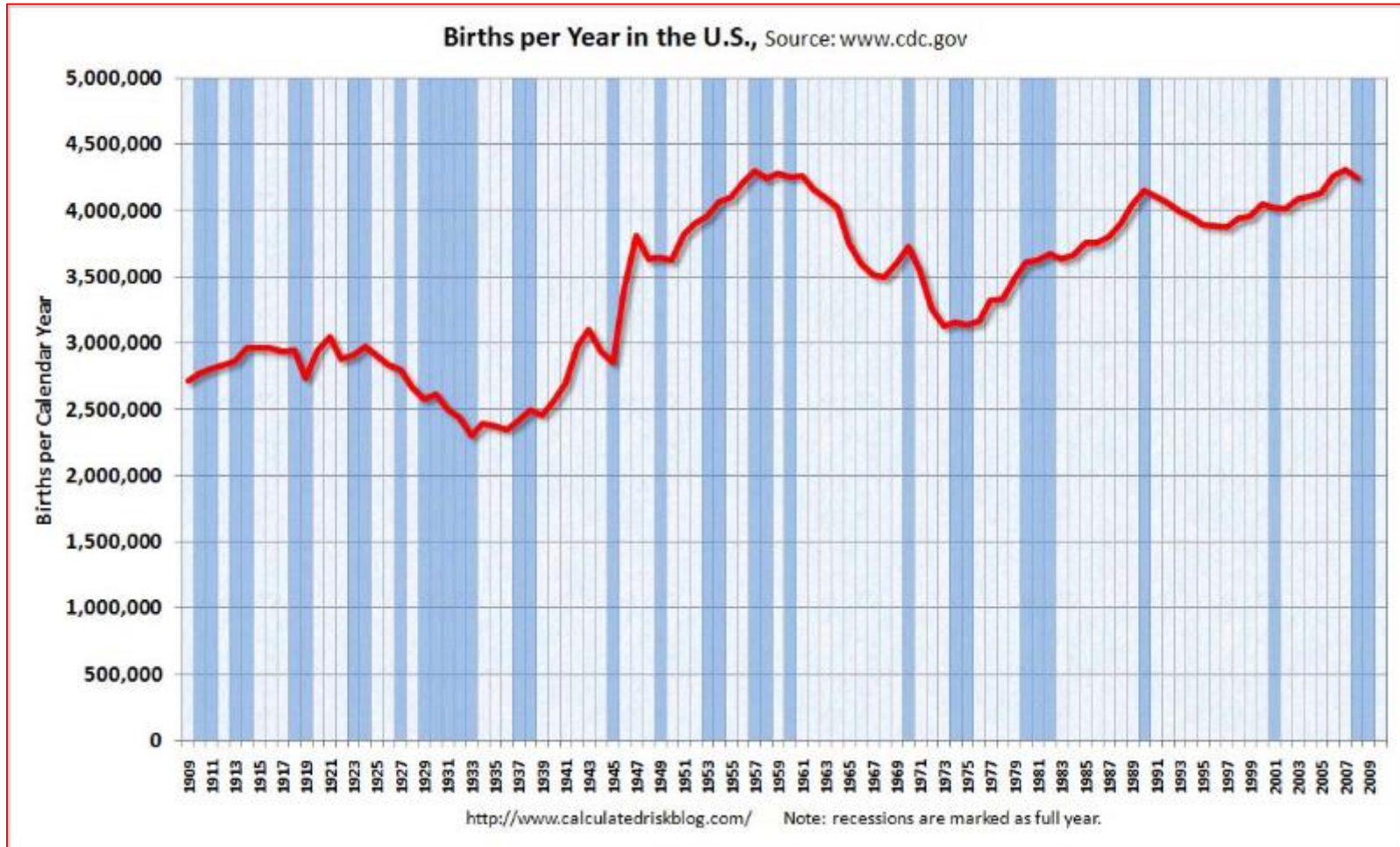
Pregnancy Care ECHO Conference
February 22, 2109

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Births in United States



Background

- 20% of pregnant women undergo induction of labor (IOL)
- Overall rate of IOL has doubled in 20 years
- 800,000 IOL annually
- Utah: 50,000 births
 - 10,000 women IOL
 - Likely will increase with recent results of the ARRIVE study (NEJM August 2018)



Leaders in Obstetric Care Respond to the Published Results of the ARRIVE Trial

August 8, 2018



ACOG

The American College of
Obstetricians and Gynecologists



Society for
Maternal • Fetal
Medicine

High-risk pregnancy experts



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Arrive Trial: Conclusions

Induction of labor at 39 weeks in a low risk nulliparous woman did not result in a significantly lower frequency of a composite adverse perinatal outcome, but it did result in a significantly **lower frequency** of **cesarean delivery**

NEJM 2018



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Background

- IOL associated with long labor:
 - chorioamnionitits
 - endometritits
 - postpartum hemorrhage
- GOAL:
 - Decrease the time from IOL to delivery
 - Decrease failed inductions



Who?

- Unfavorable cervix
- Bishop score < 6
 - < 4?
 - < 2?

Table 1. Bishop Scoring System

Score	Factor				
	Dilation (cm)	Position of Cervix	Effacement (%)	Station*	Cervical Consistency
0	Closed	Posterior	0-30	-3	Firm
1	1-2	Midposition	40-50	-2	Medium
2	3-4	Anterior	60-70	-1, 0	Soft
3	5-6	—	80	+1, +2	—

*Station reflects a -3 to +3 scale.

Modified from Bishop EH. Pelvic scoring for elective induction. *Obstet Gynecol* 1964;24:267.



Why ?

- Physiologic changes
 - cervical remodeling
 - collagen breakdown
 - increased cytokines
- **Expedite labor**



How?

- Prostaglandin E1
 - misoprostol
- Prostaglandin E2
 - dinoprostone gel
 - dinoprostone vaginal insert
- Oxytocin
- Mechanical cervical dilators
 - single balloon device (Foley catheter)
 - double balloon device



Prostaglandin E2

Vaginal Insert

DESIGNED FOR CERVICAL RIPENING

Easy to insert and remove!:

CERVIDIL is a thin, flat, polymeric slab which is rectangular in shape with rounded corners contained within the pouch of an off-white knitted polyester retrieval system.

Long tape retrieval system
allows CERVIDIL to be easily removed anytime

Dinoprostone-infused insert
is placed in the posterior fornix of the vagina

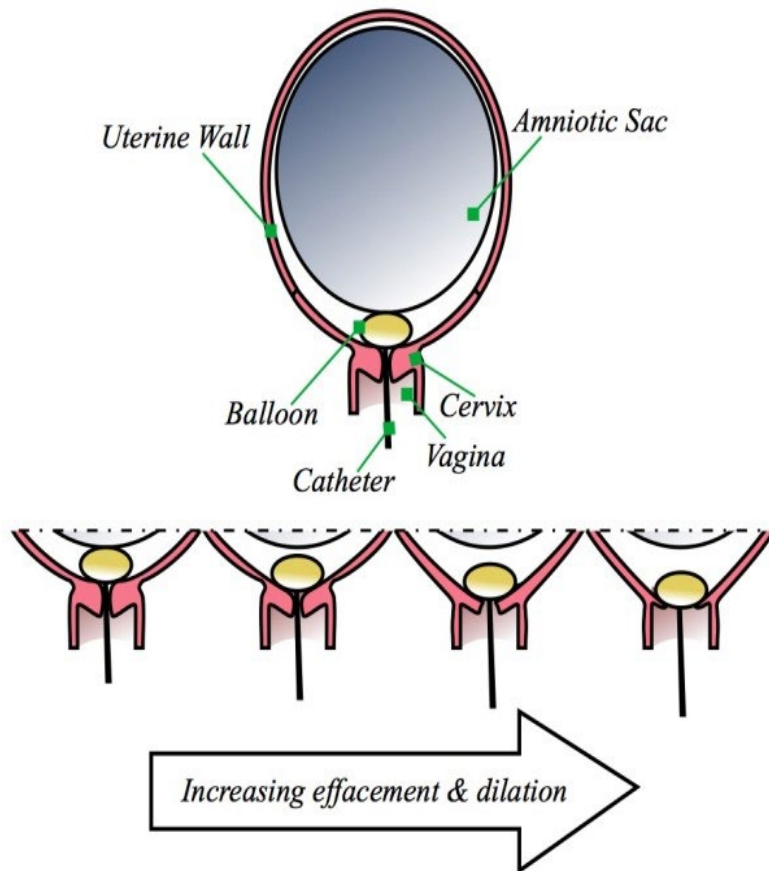
Controlled release
of dinoprostone from insert slab for up to 12 hours



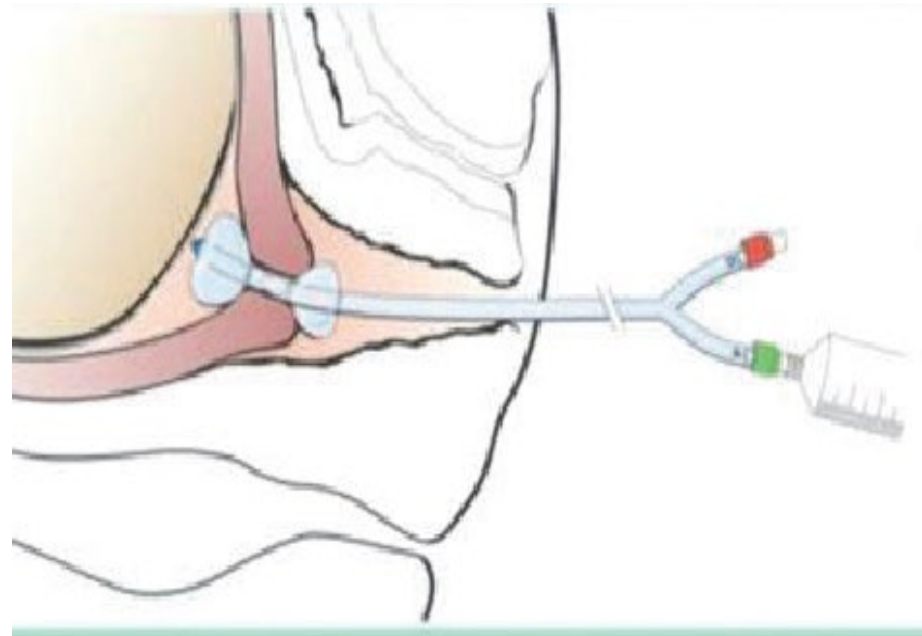
Intracervical Gel



Single balloon catheter



Double balloon catheter



Single vs Double Balloon Catheter

- No difference the rate of c/s or vaginal delivery in 24 h
- No difference in time from catheter insertion to delivery.
- **Cost significantly favors the use of single balloon devices.**
 - \$41 vs. \$3
 - \$65 vs. \$2.80

Fang et al *Journal of Obstetric and Gynaecology Research*
December 2017



Transcervical Foley: 80cc vs 30cc?

- Overall labor shortened by 2 hours
 - No change in c/s rate
 - Similar time to **vaginal** delivery
 - No difference in maternal complications
 - No difference in fetal complications

Schoen et al *Acta Obstet Gynecol Scand* 2018



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Cervical Ripening: Combination Therapy

Agent	Time to delivery (hours)
Misoprostol	17.6
Foley	17.7
Misoprostol AND Foley	13.1
Oxytocin AND Foley	14.5 (P < 0.001)

Levine et al *Obstet Gynecol* December 2016



Transcervical Balloon and PROM

Foley Plus Oxytocin Compared With Oxytocin for Induction After Membrane Rupture: A Randomized Controlled Trial. [Mackeen AD¹](#), [Durie DE](#), [Lin M](#), [Huls CK](#), [Qureshey E](#), [Paglia MJ](#), [Sun H](#), [Sciscione A](#) *Obstet Gynecol.* 2018 Jan;131(1):4-11

201 patients enrolled, > 34 weeks, PROM
Oxytocin vs Foley AND Oxytocin

CONCLUSION: Time to delivery **similar** (13.9 vs 14.4 hours)
Choriamnioitis **increased** 8% vs 0% in balloon group.



Prior Cesarean Section

- Risk of uterine rupture [OR] 3.01, 95% CI 1.66-5.46
 - Spontaneous labor 4/1,000
 - Oxytocin alone: 11 /1,000
 - Mechanical +/- oxytocin 9/1,000
 - Prostaglandins =/- oxytocin 14/1,000

Landon et al NEJM 2004



Uterine Rupture with Protruded Legs in a Large Amniocele



Prior Cesarean Section

- Mechanical ripening
 - 2016 meta-analysis 1447 women
 - 18/1447 uterine rupture (1.2%)
 - 9 of 18 rupture in active labor
- Maternal and fetal safety
 - No hyperstimulation / tachysystole / FHR change
 - Endorsed by ACOG and SOGC



Prior Cesarean Section

- Prostaglandins
 - Misoprostol vs Pitocin
 - RCT
 - 2/17 misoprostol – uterine rupture
 - RCT ended early

Wing et al Obstet Gynecol 1998



Outpatient Cervical Ripening

- 1988: Explored prostaglandin E₂
- 2000: Misoprostol
- 2001: **Transcervical Foley catheter for preinduction cervical ripening in an outpatient versus inpatient setting**
 - [Sciscione et al Obstet Gynecol Nov 2001](#)





2016

Annual Clinical *and* Scientific Meeting

Washington Convention Center > May 14-17, 2016 > Washington, DC



Take
Charge of
Health
Care

**VALUE OF
OUTPATIENT
CERVICAL RIPENING
DEBATED**

ACCOG



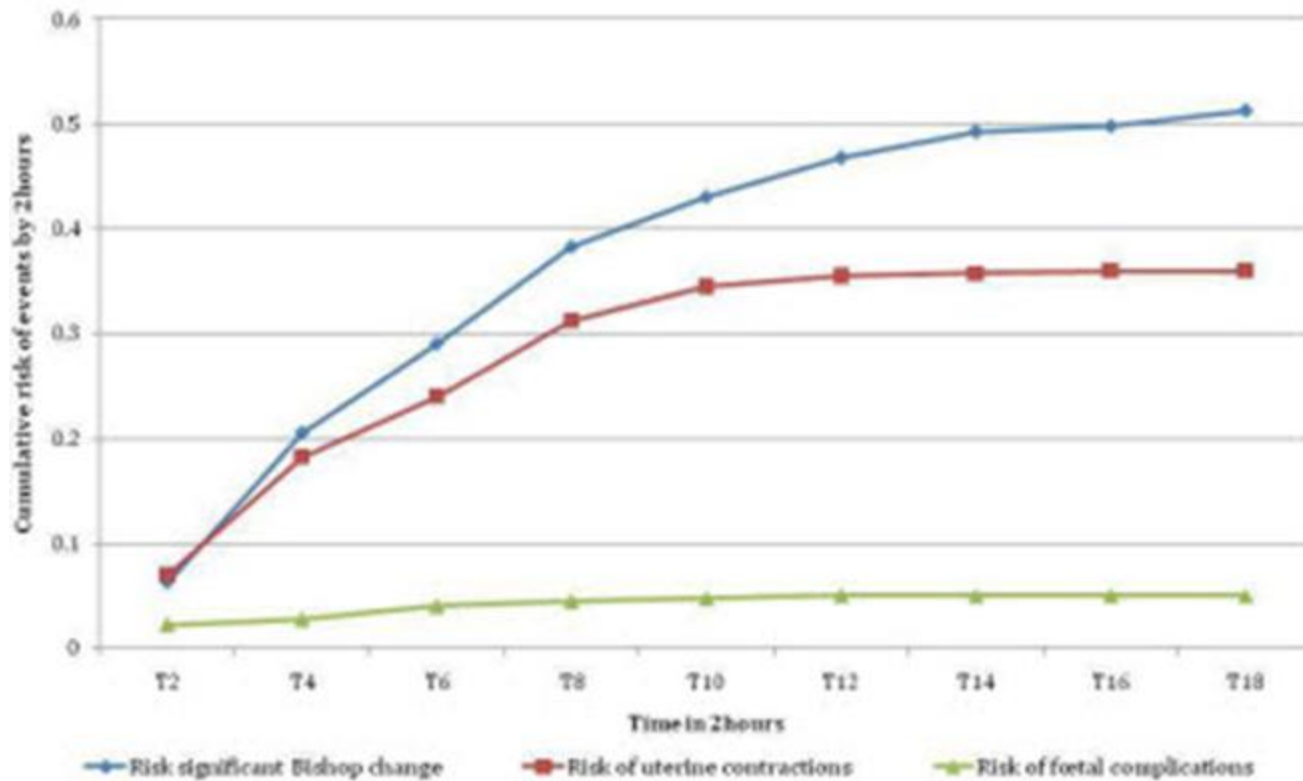
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Questions

- Is there a time limit?
 - misoprostol
 - oxytocin
 - balloon
- Can multiple agents be used?
- Multiparous patients?



Figure 1: Risks of cervical changes and of competing events (uterine contractions and fetal complications) during cervical ripening with misoprostol.



Summary

- Shortens time from induction to delivery
- No obvious superior agent
- Combination therapy most effective



Summary

- Single balloon = double balloon
 - Significantly less expensive
- TOLAC: avoid prostaglandins
- Outpatient treatment: Clear protocols
 - Safe
 - Likely more widely implemented



Case

- 18 yo G1 at 36 weeks
 - IOL for preeclampsia with severe features
 - Cervix closed/ long/ firm / posterior/ -3

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Case

- 42 yo G3 P1011 39 weeks
 - Elective induction
 - Cervix 1/25/ medium/ midposition/ -2

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CASE

- 37 yo G3P2002 41 weeks
- BMI 50
- Previous c/s
- Closed/ 50/ mid /firm / -2

