

## Inter-Pregnancy Interval, Contraception and Preterm Birth

Lisa M Goldthwaite, MD, MPH

March of Dimes 17th Annual Conference for Health Professionals

March 13th, 2017

Costa Mesa, California

Acknowledgement: Kate A Shaw, MD, MS



### Disclosures

Dr. Goldthwaite serves as a Nexplanon clinical trainer for Merck & Co



### Objectives

1. Review the evidence regarding inter-pregnancy interval and preterm birth
1. Increase familiarity with long acting reversible contraception (LARC) methods: IUDs and Implants
1. Appreciate the role of LARC in:
  - Unintended pregnancy and preterm birth
  - Inter-pregnancy interval
  - Recurrent preterm birth
  - Immediate postpartum setting



## INTER-PREGNANCY INTERVAL (IPI)




---

---

---

---

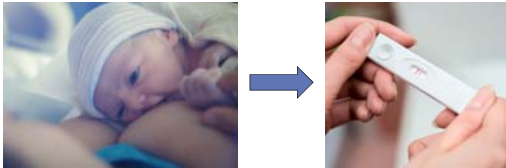
---

---

---

---

## Inter-pregnancy Interval




---

---

---

---

---

---

---

---

## Short Inter-pregnancy Interval

- IPI < 18-24 months
  - lower birth weight and preterm birth for new infant
  - malnutrition, infection, increased second year mortality for previous child
  - Delayed and insufficient prenatal care
  - Increased risk of rupture after cesarean
    - Inter-pregnancy interval <6 months 2.6 risk of uterine rupture with TOLAC
- WHO recommendation: birth spacing at least 2 years

Conde-Agudelo 2006, Miller 1991, Stamilio 2007, WHO




---

---

---

---

---

---

---

---

### Unmet Need for Contraception: Postpartum

- >60% women in postpartum period
- Advantages of postpartum period
  - Motivated to prevent pregnancy
  - Know they're not pregnant\*
- Challenges include
  - Perception about conflicts with breastfeeding
  - Schedule of post-partum visits
  - No show for post-partum visits
  - Cost

Rossier C, et al. Studies in Fam Plan 2015



## LONG ACTING REVERSIBLE CONTRACEPTION (LARC)



### Comparing Effectiveness of Family Planning Methods



Source:  
Morris RE, Trussell J, Morris JA, Condon S, Subramaniam L, Irvine G. Communicating contraceptive effectiveness: a randomized controlled trial to deliver a short-month Organization family planning handbook. *Am J Obstet Gynecol*. 2009;200(5):509-515.

World Health Organization Department of Reproductive Health and Research (WHO/RH), Johns Hopkins Bloomberg School of Public Health (JHSPH)/Center for Communications Programs (CCP), Family Planning a Global Handbook for Providers, Baltimore, MD and Geneva (G) and WHO, 2007.

Copyright © Choosing a contraceptive: efficacy and personal considerations. In: Morrell KE, Trussell J, Jones K, Nelson AL, Goss AM, Guest K, Rowland D, eds. *Contraceptive Technology*, Khanna's Second Edition. New York: Ashford Media Inc.; in press.

% Women experiencing unintended pregnancy during the first year of use

Method	Perfect Use	Typical Use	Continuation %
Withdrawal	4	22	46
Pill	0.3	9	67
Injection	0.3	9	56
Copper IUD	0.6	0.8	78
LNG-IUS	0.2	0.2	80
Implant	0.05	0.05	84
Tubal	0.5	0.5	100

Trussell: Contraceptive Technology 20<sup>th</sup> edition.




---

---

---

---

---

---

---

---

## Copper IUD

- ParaGard

- 10 years

- Mechanism of action:

Spermicide: the copper IUD causes an increase in uterine and tubal fluids containing copper ions, enzymes, prostaglandins, and white blood cells that impair sperm function and prevent fertilization




---

---

---

---

---

---

---

---

## Levonorgestrel IUD

- Mirena (52mg) - 5 years
- Kyleena (19.5mg) - 5 years
- Skyla (13.5mg) - 3 years

- Liletta (52mg) - 3 years (>>?)

- Mechanism of action

- Thickening of cervical mucus
- Inhibition of sperm capacitation and survival
- Thinning of endometrial lining
- +/-ovulation inhibition




---

---

---

---

---

---

---

---

## Implant

- Nexplanon
- 3 years
- Single 40mm x 2mm implant that releases etonogestrel
- Placed subdermally in upper arm
- Mechanism of action
  - Ovulation suppression
  - Thickening of cervical mucus
  - Thinning of endometrial lining



 FAMILY PLANNING  
SERVICES & RESEARCH

---

---

---

---

---

---

---

---

## UNINTENDED PREGNANCY, LARC AND PRETERM BIRTH

 FAMILY PLANNING  
SERVICES & RESEARCH

---

---

---

---

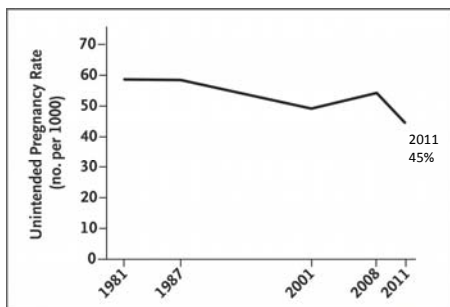
---

---

---

---

### Rates of Unintended Pregnancy, 1981–2011



Finer LB, Zolna MR. N Engl J Med 2016

 FAMILY PLANNING  
SERVICES & RESEARCH

---

---

---

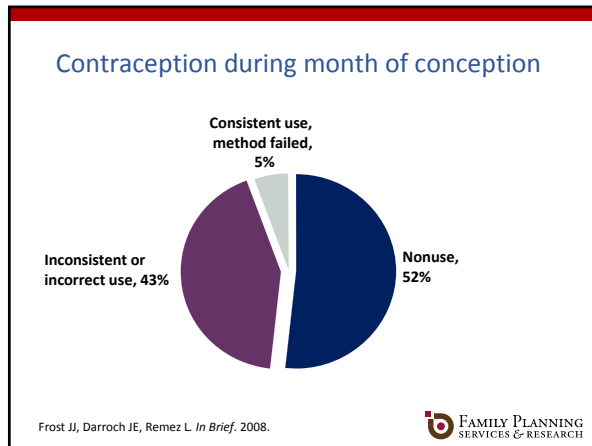
---

---

---

---

---




---

---

---

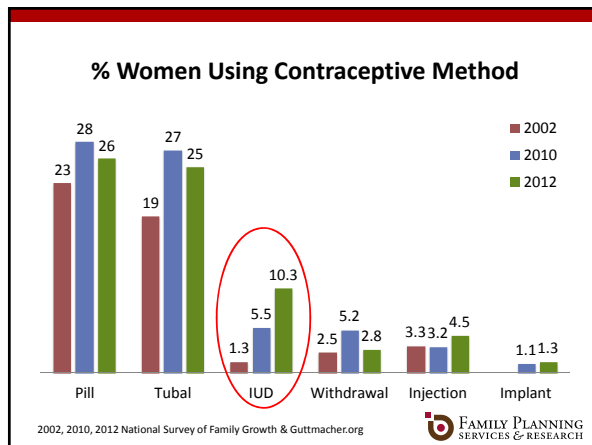
---

---

---

---

---




---

---

---

---

---

---

---

---

### Unintended Pregnancy and Preterm Birth

- Unintended pregnancies that results in live births have increased odds of preterm birth compared to intended pregnancies:
  - OR =1.31; 95% CI 1.09, 1.58
- Multifaceted link:
  - maternal socioeconomic risk factors
  - inadequate prenatal care
  - preconceptional and prenatal maternal behavioral risk factors such as smoking and alcohol use

Shah. *Matern Child Health J*. 2011; Mohilajee. *Obstet Gynecol*. 2007; Hellerstedt. *Am J Public Health*. 1998; Robbins. *MMWR Surveill Summ*. 2014

**FAMILY PLANNING SERVICES & RESEARCH**

---

---

---

---

---

---

---

---

### Colorado Initiative to Reduce Unintended Pregnancy: An opportunity for state-wide assessment




---

---

---

---

---

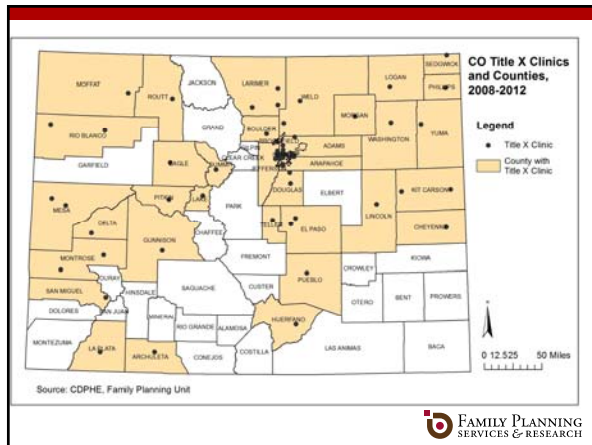
---

---

---

---

---




---

---

---

---

---

---

---

---

---

---

### Title X Clinic Services in Colorado

Year	Number of clients served	Number LARC users	Proportion of LARC users out of all women using contraception
2008	46201	314	0.8%
2012	64148	4356	8.6%

CDPHE Family Planning Division

FAMILY PLANNING SERVICES & RESEARCH

---

---

---

---

---

---

---

---

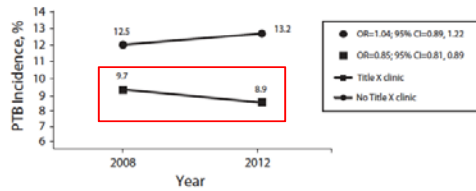
---

---

## Preterm Birth & LARC

Colorado Initiative to Reduce Unintended Pregnancy (2008-2013)

- Increased uptake of LARC 0.8% → 8.6%



Goldthwaite LM, et al. Am J Pub Health 2015



## LARC AND IPI



## Inter-Pregnancy Interval & PP LARC

California 2008: 117,644 women

Contraceptive Method	Total %	OR achieving >18mo IPI
LARC	4.4	3.89 (3.55-4.26)
User dependent	55.3	1.89 (1.80-1.98)
Barrier	7.1	1.00 (Reference)
None	33.2	0.66 (0.63-0.69)

Thiel de Bocanegra H, et al. AJOG 2014





### Preterm Birth & PP LARC

California 2011: 111,948 women

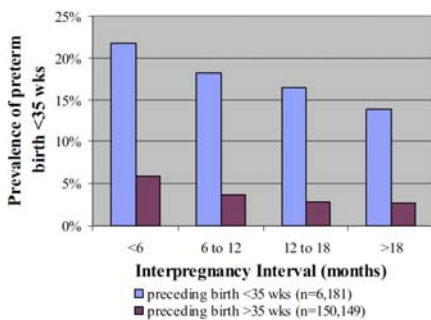
- 9.75% preterm birth (1.28% <32 wks)
- Each month of coverage reduces PTB by 1%
  - OR 0.989 (0.986-0.993)

Contraceptive Method	Total %	Mean coverage (months)
LARC	8.1	11.5
User dependent	49	7.8
Barrier	8.2	0.6
None	34.8	

Rodriguez MI, et al. AJOG 2015

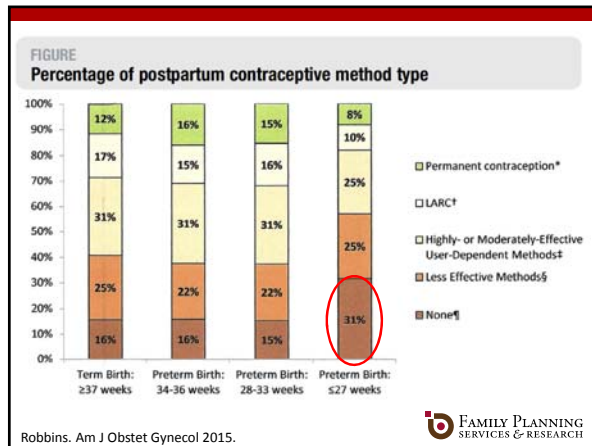


### LARC AND RECURRENT PRETERM BIRTH



DeFranco. A short interpregnancy interval is a risk factor for preterm birth and its recurrence. AJOG 2007.






---

---

---

---

---

---

---

---

---

---

**How to make an impact?**

- Ensure education for patients around risk of recurrent preterm birth
- Ensure education regarding contraceptive options
- Improve access to all contraceptive options, including LARC, in the postpartum period

**FAMILY PLANNING SERVICES & RESEARCH**

---

---

---

---

---

---

---

---

---

---

**POSTPARTUM CONTRACEPTION**

**FAMILY PLANNING SERVICES & RESEARCH**

---

---

---

---

---

---

---

---

---

---

Postpartum Rounding

What's your plan for contraception?

FAMILY PLANNING SERVICES & RESEARCH

---

---

---

---

---

---

---

---

28-32 week visit

---

---

---

---

---

---

---

---

Postpartum Considerations

- Most couples resume sexual activity within 1-2 months
  - 66% by first month
  - 88% by second month
- Menstrual cycle return
  - 4-6 weeks postpartum
- Risk of thrombosis with Estrogen products
  - Baseline after 3 weeks postpartum

Ford, 1987, Speroff 2008, Baldwin 2016

FAMILY PLANNING SERVICES & RESEARCH

---

---

---

---

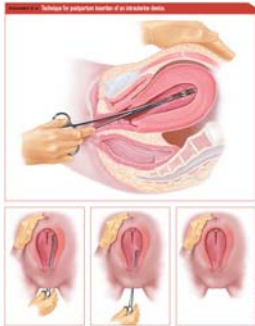
---

---

---

---

### Immediate Postpartum IUD & Implant Insertion



Voedisch AJ, Blumenthal PD. Contemporary OB/GYN. 2012.

 FAMILY PLANNING  
SERVICES & RESEARCH

---

---

---

---

---

---

---

---

### Contraceptive Implant & Lactation

- RCT: early (1-3 days) vs standard (4-8 weeks)
- N= 69
- Time to lactogenesis stage II and lactation failure
  - No difference
    - Early  $64.3 \pm 19.6$  hrs; standard:  $65.2 \pm 18.5$  hrs
    - 1 lactation failure in early group
- Milk composition the same at 6 weeks
- 32% of standard did not return for 6 week visit

Gurtcheff et al. Obstet Gynec. 2011

 FAMILY PLANNING  
SERVICES & RESEARCH

---

---

---

---

---

---

---

---

### Contraceptive Implant & Lactation

- RCT: Implant (<48hrs) vs. NO Contraception
- N = 24
- Oral D<sub>2</sub>O maternally administered Day 0 and 29
- Saliva samples (maternal, newborn)
  - <sup>2</sup>H levels measured to estimate milk ingested
- No difference
  - milk ingested
  - weight gain at 6wks

Braga GC, et al Contraception 2015

 FAMILY PLANNING  
SERVICES & RESEARCH

---

---

---

---

---

---

---

---

## Breastfeeding and Progestins

- Systematic Review
- 47 studies
- Progestin-only contraception (POP, Injection, Implant, IUD)
- Failed to show any negative effects of Progestins
  - Only 1/47 showed difference in breastfeeding rates with LNG-IUD
  - This was not consistent with ETG-Implant studies

“The preponderance of evidence fails to demonstrate adverse breastfeeding outcomes or negative health outcomes in infants such as restricted growth, health problems or impaired development.”

Kapp N & Curtis KM Contraception 2009  
Phillips SJ, et al. Contraception 2015




---

---

---

---

---

---

---

---

## Clinical Guidelines and Recommendations



**ACOG**  
THE AMERICAN COLLEGE  
OF OBSTETRICIANS  
AND GYNECOLOGISTS




---

---

---

---

---

---

---

---

### Practical Use of WHO/CDC Medical Eligibility Criteria

Category	With Clinical Judgment	With Limited Clinical Judgment
1	Use in any circumstance	YES (use method)
2	Generally Use	
3	Use not usually recommended unless other more appropriate methods are not available or not acceptable	NO (don't use or consult expert)
4	Method not to be used	

World Health Organization/CDC




---

---

---

---

---

---

---

---

U.S. Medical Eligibility Criteria for Contraceptive Use: Postpartum Contraception				
	CHC	POP	DMPA	Implant
<b>Postpartum (breastfeeding)</b>				
<21 days	4	2	2	2
21 to <30 days with other VTE risk factors	3	2	2	2
21 to <30 days without other VTE risk factors	3	2	2	2
30 to 42 days with other VTE risk factors	3	1	1	1
30 to 42 days without other VTE risk factors	2	1	1	1
>42 days	2	1	1	1
<b>Postpartum (non-breastfeeding)</b>				
<21 days	4	1	1	1
21 to 42 days with other VTE risk factors	3	1	1	1
21 to 42 days without other VTE risk factors	2	1	1	1
>42 days	1	1	1	1

 FAMILY PLANNING  
SERVICES & RESEARCH

---

---

---

---

---

---

---

---

---

---

U.S. Medical Eligibility Criteria for Contraceptive Use: Postpartum Contraception		
Postpartum (breastfeeding, non-breastfeeding, and including post-Cesarean section)	Copper IUD	Levonorgestrel IUD
<10 minutes after delivery of the placenta	1	2
≥10 minutes to <4 weeks	2	2
≥4 weeks	1	1
Puerperal sepsis	4	4

 FAMILY PLANNING  
SERVICES & RESEARCH

---

---

---

---

---

---

---

---

---

---

### ACOG: Committee Opinion 642 (Oct 2015)

"The convenience and subsequent high continuation rates of LARC placement immediately postpartum or after second-trimester abortion may outweigh the disadvantage of higher IUD expulsion rates."

#### Best Practices for Long-Acting Reversible Contraception Insertion

- Provide LARC methods the same day as requested, whenever possible, if pregnancy can reasonably be excluded.
- Offer LARC methods at the time of **delivery, abortion**, or **dilation and curettage for miscarriage**.
- Screen for sexually transmitted infections at the time of IUD insertion; if the screening test result is positive, treat the infection without removal of the IUD.
- Offer the copper IUD as the most effective method of emergency contraception.

 FAMILY PLANNING  
SERVICES & RESEARCH

---

---

---

---

---

---

---

---

---

---

## Objectives

1. Review the evidence regarding inter-pregnancy interval and preterm birth
1. Increase familiarity with long acting reversible contraception (LARC) methods: IUDs and Implants
1. Appreciate the role of LARC in:
  - Unintended pregnancy and preterm birth
  - Inter-pregnancy interval
  - Recurrent preterm birth
  - Immediate postpartum setting




---

---

---

---

---

---

---

---

Thank you!




---

---

---

---

---

---

---

---