Update on Long Acting Reversible Contraception

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Disclosures
Learning Objectives

At the end of this presentation, participants should be able to:

• List and compare clinical effects and characteristics of IUDs and implants
• List 3 of ACOGs clinical recommendations on the contraceptive implant or IUDs
• Describe the management of common issues that arise with use of IUDs or implants
• Describe the appropriateness of LARC methods for most women including nulliparous women and adolescents
What percent of pregnancies in the US are unintended?

- A. 18
- B. 34
- C. 49
- D. 76
- E. 90
Unintended Pregnancy in the U.S.

6.2 million pregnancies

- Intended: 51%
- Unintended: 49%
  - Birth: 22%
  - Abortion: 20%
  - Fetal Loss: 7%

Unplanned Pregnancy in the US

- Most American families want two children.
  - 5 years pregnant, postpartum, or trying
  - 30 years avoiding unplanned pregnancy
- By age 45 almost half of American women will have experienced an unplanned pregnancy
  - 1/3 of American women will have an abortion
Demographic Disparities in Rates of Unintended Pregnancy
Unintended Pregnancy Rate, U.S. women age 15-44

What percentage of women who are sexually active use at least one contraceptive method?

- A. 20
- B. 35
- C. 53
- D. 89
- E. 98
The small percentage of women who do not use contraceptives account for roughly half of all unintended pregnancies.
US Abortion rate higher than most other countries

![Bar chart showing abortion rates per 1000 women for different countries. The United States has the highest rate, followed by Australia, Sweden, Denmark, Canada, England and Wales, Netherlands, and France, which has the lowest rate.](chart)
US lags Europe in IUD use
Crucial determinants of unplanned pregnancy...

- The US has an inadequate social and healthcare safety net
- Greater inequality
- More widespread poverty
- More racism
- A bigger gap between rich and poor
What is the price of a copper IUD in France?

• A. $300.00
• B. 100 Euros
• C. 50 Francs
• D. $20.00
What is better in France?

$20
What are the top 3 contraceptive methods used in the US?

1. Pills, withdrawal, condoms
2. Abstinence, condoms, sterilization
3. Depo, IUDs, condoms
4. Pills, condoms, sterilization
5. Condoms, pills, Depo
What factors into contraceptive efficacy?
## Contraceptive Efficacy

<table>
<thead>
<tr>
<th>Method</th>
<th>Typical Use Failure</th>
<th>Perfect Use Failure</th>
<th>% Continuation at one year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Withdrawal</td>
<td>27</td>
<td>4</td>
<td>43</td>
</tr>
<tr>
<td>Male Condom</td>
<td>16</td>
<td>6</td>
<td>57</td>
</tr>
<tr>
<td>OCP</td>
<td>8</td>
<td>0.3</td>
<td>68</td>
</tr>
<tr>
<td>Depo-Provera</td>
<td>3</td>
<td>0.3</td>
<td>56</td>
</tr>
<tr>
<td>ParaGard</td>
<td>0.8</td>
<td>0.6</td>
<td>78</td>
</tr>
<tr>
<td>Mirena</td>
<td>0.2</td>
<td>0.2</td>
<td>80</td>
</tr>
<tr>
<td>Implanon</td>
<td>0.05</td>
<td>0.05</td>
<td>85</td>
</tr>
<tr>
<td>Female Sterilization</td>
<td>0.5</td>
<td>0.5</td>
<td>100</td>
</tr>
<tr>
<td>Male Sterilization</td>
<td>0.15</td>
<td>0.1</td>
<td>100</td>
</tr>
</tbody>
</table>
## Comparing Typical Effectiveness of Contraceptive Methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Effectiveness</th>
<th>How to make your method more effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implants</td>
<td>Most effective</td>
<td>One-time procedures; nothing to do or remember</td>
</tr>
<tr>
<td>Female Sterilisation</td>
<td>Generally 1 or fewer pregnancies per 100 women in one year</td>
<td>Need repeat injections every 1, 2 or 3 months</td>
</tr>
<tr>
<td>Vasectomy</td>
<td></td>
<td>Must take a pill or wear a patch or ring every day</td>
</tr>
<tr>
<td>Injectables</td>
<td></td>
<td>Must follow LAM instructions</td>
</tr>
<tr>
<td>Pills</td>
<td></td>
<td>Must use every time you have sex; requires partner's cooperation</td>
</tr>
<tr>
<td>Patch</td>
<td></td>
<td>Must use every time you have sex</td>
</tr>
<tr>
<td>Vaginal Ring</td>
<td></td>
<td>Must use every time you have sex</td>
</tr>
<tr>
<td>Lactational Amenorrhea Method (LAM)</td>
<td></td>
<td>Must follow LAM instructions</td>
</tr>
<tr>
<td>Male condoms</td>
<td></td>
<td>Must use every time you have sex</td>
</tr>
<tr>
<td>Diaphragm</td>
<td></td>
<td>Require partner's cooperation; for FABs must abstain or use condoms on fertile days</td>
</tr>
<tr>
<td>Cervical Cap</td>
<td></td>
<td>Must use every time you have sex</td>
</tr>
<tr>
<td>Sponge</td>
<td></td>
<td>Must use every time you have sex</td>
</tr>
<tr>
<td>Female Condoms</td>
<td></td>
<td>Must use every time you have sex</td>
</tr>
<tr>
<td>Fertility Awareness-Based Methods (selected)</td>
<td></td>
<td>Must use every time you have sex</td>
</tr>
<tr>
<td>Withdrawal</td>
<td></td>
<td>Must use every time you have sex</td>
</tr>
<tr>
<td>Spermicides</td>
<td></td>
<td>Must use every time you have sex</td>
</tr>
</tbody>
</table>

Source: WHO 2006
What is LARC?
Renewed interest in IUD
# LARC Methods in the US

<table>
<thead>
<tr>
<th>LONG-ACTING REVERSIBLE CONTRACEPTION</th>
<th>INTRAUTERINE DEVICE (IUD)</th>
<th>IMPLANT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mirena</td>
<td>Skyla</td>
</tr>
<tr>
<td>Active ingredient</td>
<td>Hormonal (levonorgestrel)</td>
<td></td>
</tr>
<tr>
<td>Effective time</td>
<td>Up to five years</td>
<td>Up to 10 years</td>
</tr>
<tr>
<td>Failure rate in practice</td>
<td>0.2%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Year method was FDA approved</td>
<td>2000</td>
<td>1984</td>
</tr>
<tr>
<td>Notable features</td>
<td>Also marketed for treatment of heavy menstrual bleeding</td>
<td>Marketed as the most effective reversible method that is hormone-free</td>
</tr>
</tbody>
</table>
Skyla is a small T-body made of soft, flexible plastic.

**Actual measurements**

28 mm

30 mm

**99.5% Pure silver ring differentiates Skyla on ultrasound**

Instruct patients in the event of an MRI to tell their healthcare providers if they have Skyla in place.

**Hormone reservoir**
Contains 13.5 mg of LNG

**Removal threads**

*Not actual size.*

The **Skyla inserter** is designed for single-handed loading into the insertion tube.
Not all methods are created equal...

Recommending best methods

Patient autonomy and choice
Groundbreaking....
CHOICE Study

- 10,000 women desiring contraception
- All methods free of charge
- “Standardized”: counseling
- Evidence based guidelines for appropriate candidates
  - Nulliparous women
  - Teenagers

Piepert, OB-GYN, 2012
Choice of Methods Among Adolescents

Mestad, Contraception 2011
Choice of LARC Methods Among Adolescents

- **IUD**
  - 14-17 yrs: 37%
  - 18-20 yrs: 71%

- **Implant**
  - 14-17 yrs: 63%
  - 18-20 yrs: 29%
# 12 month continuation rate

<table>
<thead>
<tr>
<th>Method</th>
<th>Continuation Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNG-IUS</td>
<td>87.5</td>
</tr>
<tr>
<td>Copper IUD</td>
<td>84.1</td>
</tr>
<tr>
<td>Implant</td>
<td>83.3</td>
</tr>
<tr>
<td>Any LARC</td>
<td>86.2</td>
</tr>
<tr>
<td>DMPA</td>
<td>56.2</td>
</tr>
<tr>
<td>OCPs</td>
<td>55.0</td>
</tr>
<tr>
<td>Ring</td>
<td>54.2</td>
</tr>
<tr>
<td>Patch</td>
<td>49.5</td>
</tr>
<tr>
<td>Non-LARC</td>
<td>54.7</td>
</tr>
</tbody>
</table>

Piepert Obstet Gynecol 2011
CHOICE: Unintended Pregnancy by Method

Risk of failure 20 X higher with P/P/R than with LARC
Probability of Unintended Pregnancy by Method
Table 3. Hazard Ratio for Unintended Pregnancy, According to Contraceptive Method and Selected Characteristic.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unintended Pregnancy (N=156)</th>
<th>Total Participant-Years</th>
<th>Incidence</th>
<th>Hazard Ratio (95% CI)†</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no.</td>
<td>no./100 participant-years</td>
<td></td>
<td>Unadjusted</td>
</tr>
<tr>
<td>Contraceptive method</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LARC</td>
<td>21</td>
<td>7655</td>
<td>0.27</td>
<td>1.00</td>
</tr>
<tr>
<td>DMPA</td>
<td>2</td>
<td>902</td>
<td>0.22</td>
<td>0.72 (0.17–3.09)</td>
</tr>
<tr>
<td>PPR</td>
<td>133</td>
<td>2924</td>
<td>4.55</td>
<td>16.05 (10.19–25.29)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;21 yr</td>
<td></td>
<td></td>
<td></td>
<td>1.83 (1.25–2.69)</td>
</tr>
<tr>
<td>≥21 yr</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school or less</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Some college</td>
<td></td>
<td></td>
<td></td>
<td>0.73 (0.52–1.03)</td>
</tr>
<tr>
<td>College degree or higher</td>
<td></td>
<td></td>
<td></td>
<td>0.49 (0.28–0.87)</td>
</tr>
<tr>
<td>Previous unintended pregnancies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>3.22 (1.99–5.19)</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>3.95 (2.29–6.81)</td>
</tr>
<tr>
<td>≥3</td>
<td></td>
<td></td>
<td></td>
<td>5.77 (3.40–9.81)</td>
</tr>
</tbody>
</table>

* The remaining 178 of the 334 unintended pregnancies were attributed to failure of condoms, withdrawal, or any form of contraception that was not included in this analysis. Only periods of index contraceptive-method use (pills, patch, ring, DMPA injection, implant, or intrauterine device) and associated pregnancies were included in this analysis.

† Hazard ratios were adjusted for age, educational level, and number of previous unintended pregnancies.
• Risk of failure 20 times higher with pills/patch/ring than with LARC in all women
• Risk of failure with teenagers using pill/patch/ring TWICE as high as for adult women

• Somewhat or very satisfied with method
• IUD – 80%
• Pills/patch/ring – 54%
CHOICE Project

Pregnancy among teens

National rate: 34.3 per 1,000

Rate for teens provided free birth control: 6.3 per 1,000
Consequences of providing no cost contraception

- Population based reduction in abortion
- 20% decline in number of abortions in the CHOICE population compared to a similar Missouri population without the CHOICE intervention
  - 4.4-7.5 abortions/1,000 in study population vs. 13.4-17/1,000 in St. Louis region vs. 19.6/1,000 in US
- 1 abortion prevented for every 108 women given free contraceptive

Piepert, OB-GYN, 2012
Affordable Care Act

YOU GET FREE BIRTH CONTROL &
YOU GET FREE BIRTH CONTROL

WE ALL GET FREE BIRTH
CONTROL!

memegenerator.net
Candidates for LARC

• Healthy women of any reproductive age who:
  • Desire highly effective contraception
  • Desire reversible contraception
  • Are nulliparous or parous
ACOG Recommendations

• LARC methods should be offered as first-line contraceptive methods and encouraged as options for most women
• LARC methods have few contraindications
• Almost all women are eligible for the implant and IUDs

Nulliparous Women and Adolescents Can Be Offered LARC Methods

• Safe and effective
• No increase in infertility
• LNG IUS appropriate for nulliparous women with menorrhagia and/or dysmenorrhea
• IUD expulsion, bleeding, and pain are slightly more likely among nulliparous women

Grimes, 2000, US MEC 2010
Myth: IUD increases risk of PID

- Pre-existing STI at time of insertion, not the IUD itself, increases risk
- No reason to restrict use based on sexual behaviors
- STI/PID risk similar with and without the IUD

Svenson, L, et al. JAMA, 1984
Farley T et al, Lancet, 1992
Grimes, DA, Lancet, 2000
Fact: risk of PID higher only in the first 20 days after insertion

History of ectopic pregnancy is NOT a contraindication to IUDs

- LNG IUS package insert
  - “…no history of ectopic pregnancy or condition that would predispose to ectopic pregnancy”

- WHO and CDC support routine use of IUDs in women with a history of ectopic pregnancy

US MEC, 2010
False rumors about the IUD
Fearmongering

MIRENA IUD
LAWSUITS

AUDET AND PARTNERS, LLP
(800) 965-1461
CDC Medical Eligibility Criteria 2010 App Available!!!
## LARC Use with Medical Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Copper IUD</th>
<th>LNG IUS</th>
<th>Implant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Multiple cardiovascular risk factors</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>History of DVT/PE/Thrombogenic mutations</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>DVT/PE on anticoagulant therapy</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Stroke</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
# LARC Use with Medical Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Copper IUD</th>
<th>LNG IUS</th>
<th>Implant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migraines with aura</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Obesity</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>HIV infection</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>AIDS (on ARV therapy)</td>
<td>2</td>
<td>2</td>
<td>2 or 1*</td>
</tr>
</tbody>
</table>

*depending on type of therapy
### Selected Contraindications

<table>
<thead>
<tr>
<th>Condition</th>
<th>Copper IUD</th>
<th>LNG IUS</th>
<th>Implant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-puerperal sepsis or septic abortion</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Current PID, purulent cervicitis, CT/GC</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Breast cancer</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Malignant GTN</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Cervical/Endometrial Cancer</td>
<td>4</td>
<td>4</td>
<td>2/1</td>
</tr>
<tr>
<td>Distorted uterine cavity incompatible with IUD insertion</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>
Copper IUD as EC

• Most effective method of emergency contraception

• Can be inserted up to 5 days after unprotected intercourse to prevent pregnancy
Other Procedures

- Can be performed with IUD in place
  - Endometrial biopsy
  - Colposcopy
  - Endocervical curettage
  - Cryotherapy
  - Cervical LEEP conization
Missing IUD Strings

• Routine return visit for IUD “String Check” no longer recommended
• Strings may reappear after next menses
• Can probe with endobrush
• If no strings can confirm IUD location with pelvic ultrasound in the office
• If ultrasound negative, obtain KUB
Ultrasound of Copper IUD
Ultrasound of Mirena IUS
Alligator (aka Mathieu) forceps

Best instrument EVER for IUD removal
If missing strings !!!
Malpositioned IUDs
Biggest risk factor for pregnancy with malpositioned IUD

Removal of the IUD !!!!

If IUD within uterine cavity and patient asymptomatic – let it be!!
Radiology finding of embedded IUD
5% risk of IUD expulsion

Counsel about signs of expulsion:

• Increased cramping
• Sudden change in bleeding pattern
• Long strings or feeling IUD coming through cervix
Immediate postpartum implant or IUD insertion

- Particularly favorable time
  - High motivation
  - Convenience
- Women at risk for unintended pregnancy
  - 45% report unprotected sex within 6 weeks of delivery
- IUD within 10 minutes of placental separation
- IUD expulsion rate appear to be less after cesarean
- Benefits appear to outweigh risks
Immediate or delayed insertion after suction aspiration

<table>
<thead>
<tr>
<th></th>
<th>Immediate (n=258)</th>
<th>Delayed (n=317)</th>
<th>Difference</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IUD insertion</td>
<td>258 (100%)</td>
<td>226 (71.3%)</td>
<td>28.7%</td>
<td>23.7, 33.7%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Expulsion</td>
<td>13 (5.0%)</td>
<td>6 (2.7%)</td>
<td>2.3%</td>
<td>1.0, 5.8%</td>
<td>0.05</td>
</tr>
<tr>
<td>IUD use at 6 months</td>
<td>92.3%</td>
<td>76.6%</td>
<td>17.7%</td>
<td>13.0, 22.3%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>0</td>
<td>5 (1.6%)</td>
<td>1.6%</td>
<td>--</td>
<td>0.07</td>
</tr>
</tbody>
</table>
Single Rod Contraceptive Implant

- Etonogestrel 68 mg
- Highly effective
- Rapidly reversible
- Discreet
- No pelvic exam needed
- Approved for use up to 3 years
Insertion timing

- Any time during the menstrual cycle
- Reasonably exclude pregnancy
- Back up method for 7 days unless inserted
  - Within 5 days of menses
  - Immediately postpartum of post-abortion
  - Immediately upon switching from another hormonal method
Definition of bleeding patterns

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Definitions of menstrual patterns over a 90-day reference period [9,10]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bleeding pattern</strong></td>
<td><strong>Definition</strong></td>
</tr>
<tr>
<td>Amenorrhea</td>
<td>Absence of bleeding or spotting</td>
</tr>
<tr>
<td>Frequent bleeding</td>
<td>≥4 bleeding—spotting episodes</td>
</tr>
<tr>
<td>Infrequent bleeding</td>
<td>1–2 bleeding episodes</td>
</tr>
<tr>
<td>Prolonged bleeding</td>
<td>≥1 bleeding—spotting episode lasting more than 14 days</td>
</tr>
<tr>
<td>Irregular bleeding periods</td>
<td>3–5 bleeding episodes and less than 3 bleeding-free intervals of 14 days or more</td>
</tr>
<tr>
<td>Acceptable</td>
<td>None of the above</td>
</tr>
</tbody>
</table>
Etonogestrel Implant
Bleeding Patterns

• Total number of bleeding/spotting days decreased or similar for majority of users

• Key difference:
  • irregularity and unpredictability

• ~20% amenorrhea in 1\textsuperscript{st} year
  • Increases to 30-40\% after 1\textsuperscript{st} year

Bleeding patterns with implant
First 2 years

Percentage of 90 day intervals

- Infrequent: 33.60%
- Amenorrhea: 22.20%
- Prolonged: 17.70%
- Frequent: 6.70%
Mean Bleeding/Spotting Days with Implant

Per 90 day reference period

No spotting or bleeding: 72.3
Spotting: 10.4
Bleeding: 7.3
Implant Bleeding Pattern Summary

• Provide anticipatory guidance
• Favorable bleeding patterns experienced in the first 3 months are likely to continue
• Unfavorable bleeding patterns have a 50% chance of improving
• Women with lower body weight tend to have fewer bleeding and spotting days
Management of bleeding

1st Choice
Daily COC for 21 days, followed by 7-day break. Use for up to 3 months.

2nd Choice
High-dose progestin for 21 days with 7-day break (e.g. medroxyprogesterone acetate 10mg twice daily). Use for up to 3 months.
Implant and Body Weight

• Choice Project
  • 1,168 implant users
    • 28% overweight, 35% obese
  • 4,200 IUD users
    • 27% overweight
    • 35% obese

• Three year follow up
  • Pregnancy rate the same for both groups - <1%
  • Did not vary by BMI
Impant Summary

• The MOST effective reversible contraception
• Few contraindications
• Provide anticipatory guidance regarding bleeding patterns