Using the Best Evidence to Select the Best Contraceptive

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Disclosure Statement
I have nothing to disclose.

Are you familiar with the US Medical Eligibility Criteria for Contraception?
- Yes
- No

How comfortable would you be offering a nulliparous woman an IUD if she had a history of Chlamydia and no current infection?
- Very comfortable
- Somewhat comfortable
- Uncomfortable
Would you offer a 20 year-old woman with migraine the combined oral contraceptive?

a. Yes
b. It depends
c. No

Objectives

To review contraceptive methods so that you can prioritize contraceptive counseling and provision in your practice.

To be comfortable using CDC Medical Eligibility Criteria (MEC) to determine safety.

Review basics, controversies, myths and new updates about contraceptive methods.

Jane is a 27 year-old woman taking combined oral contraceptive pills, who presents to your clinic for an annual examination. She reports having missed two periods. Her urine pregnancy test is positive.

6.4 Million U.S. Pregnancies Annually

- 52% Intended
- 25% Unintended Despite method use
- 23% Unintended No method used

Why did Jane get pregnant?

Jane ran out of pills last month. She tried to schedule an appointment, but because she was overdue for a pap smear the clinic staff couldn’t call in refills. Today was the first day she could get an appointment.

Provider Barriers to Contraception

- **Clinical Visit**
  - BP check to initiate estrogen-containing methods
  - No pap smear or other examination
  - Refill methods without seeing patient
- **Remember birth control**
  - 48% using D or X rx counseled on contraception
- **Knowledge about contraindications**
  - US guidelines

Case: US Guidelines

After Jane has completed her pregnancy she returns to you for contraceptive counseling. Jane has had migraine headaches since she was a teen. She has no aura and they have not changed with the combined pill.

Can she use the pill again?

Can my patient use this method?

<table>
<thead>
<tr>
<th>US Medical Eligibility Criteria (MEC)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Can use the method</td>
</tr>
<tr>
<td><strong>2</strong> Can use the method</td>
</tr>
<tr>
<td><strong>3</strong> Should not use method unless no other method is appropriate</td>
</tr>
<tr>
<td><strong>4</strong> Should not use method</td>
</tr>
</tbody>
</table>
Migraine and Combined Hormonal Contraception (CHC)

Migraine, COC*, and Stroke

Synergistic effect of Migraine and COC
OR 8.7 (95% CI 5.0-15.0) ¹
OR 13.9 (95% CI 5.5-35.1) ²

*COC = combined oral contraceptive pills

WHO/US: Headaches and CHC*

Non-migrainous 1
Migraine
(i) w/o focal neurologic symptoms
Age < 35 2
Age > 35 3
(ii) w/ focal neurologic symptoms
(at any age) 4

Focal symptoms = AURA = vision changes, numbness, parasthesias
Non-focal = Prodrome, photo/phonophobia, N/V

WHO/US: Headaches and CHC*

Non-migrainous 1 2
Migraine
(i) w/o focal neurologic symptoms
Age < 35 2 3
Age > 35 3 4
(ii) w/ focal neurologic symptoms
(at any age) 4 4

Focal symptoms = AURA = vision changes, numbness, parasthesias
Non-focal = Prodrome, photo/phonophobia, N/V
Absolute Risk of Stroke

<table>
<thead>
<tr>
<th>Condition</th>
<th>No COC</th>
<th>COC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>6/100,000 ♀/yr</td>
<td>12/100,000 ♀/yr</td>
</tr>
<tr>
<td>Migraine</td>
<td>12/100,000 ♀/yr</td>
<td>19/100,000 ♀/yr</td>
</tr>
<tr>
<td>Migraine + aura</td>
<td>18/100,000 ♀/yr</td>
<td>30/100,000 ♀/yr</td>
</tr>
</tbody>
</table>

Stroke in pregnancy: 34/100,000 ♀/year

Case: Counseling Issues

After reviewing the US and WHO MEC you decide Jane can use the pill again.

But is it the best method for her?

Helping patients choose the best method

Safety

Always balance against the risk of pregnancy

Efficacy

Perfect use efficacy
Frequency of intervention

Non-contraceptive benefits
Future pregnancy plans

Patient Preference

Convenience
Side effects
Efficacy

Efficacy

How effective is the combined oral contraceptive for prevention of pregnancy?

Typical use ≠ Perfect use
How effective is the combined oral contraceptive for prevention of pregnancy?

8% failure rate in 1 year

How many pills, on average, do women forget to take each month (not including placebo)?

Typical use ≠ Perfect use

Oral Contraceptives 2010: Missed Pills

Contraceptive Method Use, U.S.*

Contraception Methods
### Natural Family Planning

<table>
<thead>
<tr>
<th>Contraceptive Method</th>
<th>Failure Rate</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Perfect Use</td>
<td>Typical Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Method</td>
<td>85%</td>
<td>85%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Periodic Abstinence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard Days Method*</td>
<td>5%</td>
<td>12%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ovulation Method</td>
<td>3%</td>
<td>22%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symptothermal</td>
<td>2%</td>
<td>13-20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-Day Method*</td>
<td>3%</td>
<td>14%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Including Cycle Beads

### Barrier Methods

<table>
<thead>
<tr>
<th>Contraceptive Method</th>
<th>Failure Rate</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Perfect Use</td>
<td>Typical Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withdrawal</td>
<td>4%</td>
<td>18%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condoms</td>
<td>2%</td>
<td>17%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cervical Cap (parous/nullip)</td>
<td>26%/9%</td>
<td>32%/16%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sponge (parous/nulliparous)</td>
<td>20%/9%</td>
<td>32%/16%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female Condoms</td>
<td>5%</td>
<td>27%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diaphragm</td>
<td>6%</td>
<td>16%</td>
<td></td>
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</tbody>
</table>

### Hormonal Methods

<table>
<thead>
<tr>
<th>Contraceptive Method</th>
<th>Failure Rate</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Perfect Use</td>
<td>Typical Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combined Hormonal Pills</td>
<td>&lt;1%</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Progestin Only Pills</td>
<td>&lt;1%</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transdermal Patch</td>
<td>&lt;1%</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaginal Ring</td>
<td>&lt;1%</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Month Injection</td>
<td>&lt;1%</td>
<td>3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implants</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper IUD/LNG IUS</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Comparing Typical Effectiveness of Contraceptive Methods

(http://www.fhi.org/enFHI/Resources/EffectivenessChart.pdf)
### Frequency of Intervention

- **Permanent:** sterilization  
- **Every 10 years:** IUD  
- **Every 5 years:** IUD  
- **Every 3 years:** implant  
- **Every 3 Months:** injection  
- **Monthly:** vaginal ring  
- **Weekly:** patch  
- **Daily:** pill, NFP  
- **Episodic:** barrier methods, NFP

### Natural Family Planning: Two-day Method®

- Study of 450 women – 3,928 cycles  
- **Failure rates:**  
  - 14% typical use  
  - 3% perfect use (no intercourse)  
  - 6% semi-perfect (barriers or withdrawal)  
  - Half of pregnancies in first 3 months  
- **Mean fertile window** 12 days  
- **High acceptability**  


### Daily: Natural Family Planning

- Help women identify fertile days  
  - Fertility window 6-8 days  
  - Failure rate 12-22%  
- **Two-day method®**  
  - Simple, accurate method – quicker to learn  
  - Two questions  
    - Did I note secretions today?  
    - Did I note secretions yesterday?  
    - If yes to either, consider fertile

### Daily: Combined Oral Contraceptives

- Estrogen + progestin  
- Traditional prescription flawed  
  - Daily x 3 weeks / 1 week off  
- **Extended cycle may ↑ efficacy**  

*Baerwald, Contraception, 2004.*
Extended Cycle: Shortened hormone-free week

- 23, 24 or 26 days hormones + 2-5 days placebo
  - Decreased ovarian activity at end of placebo
  - Shorter withdrawal bleeds
  - Similar breakthrough bleeding
  - 3 FDA-approved products in US

Spona Contraception, 1996
Bachman Contraception, 2004
Endrikat Contraception, 2003

Extended Cycle: Fewer hormone-free weeks

- 12 weeks hormone/1 week off
- Ethinyl estradiol and levonorgestrel
  - 84 days LNG 150 µg/EE 30 µg; 7 days placebo
  - Decreased breakthrough bleeding over time

Anderson Contraception, 2003

Tricycle Breakthrough Bleeding/Spotting

- Continuous for one year
  - Increased spotting in first six months
  - Median 1.5 days spotting in last trimester
- FDA-approved: ethinyl estradiol and levonorgestrel
  - 90 mcg levonorgestrel + 20 mcg EE

Miller Obstetrics and Gynecology, 2003
Kaseem, Contraception, 2003
Fazlani, Contraception, 2006
Choosing a COC

- Estrogen dose
  - Low dose = < 50 mcg

- Progestin type
  - 1st-generation: norethindrone
  - 2nd-generation: levonorgestrel
  - 3rd-generation: desogestrel
  - Drosperinone: spironolactone derivative

VTE & oral progestin type

- Desogestrel and drosperinone OCPs may increase risk of VTE
- BUT. . . Absolute risk remains low

<table>
<thead>
<tr>
<th>Status</th>
<th>Non-pregnant, no COCs: 4.4 per 10,000 yrs</th>
<th>Levonorgestrel COCs: 5.0 per 10,000 yrs</th>
<th>Desogestrel COCs: 6.5 per 10,000 yrs</th>
<th>Drosperinone COCs: 7.8 per 10,000 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREGNANCY</td>
<td>29 per 10,000 yrs</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Jane no longer wants to take a pill every day. She asks you about other birth control methods which she doesn’t have to think about as often.

What can you offer her?

- Weekly
- Monthly
- 3 months
- 3 years
- 5-10 years
Daily: Progestin-only Pills (POPs)

- 35 mcg norethindrone DAILY
  - No hormone free interval!!
- Primary mechanism = cervical mucus thickening
- Requires punctual dosing
  - If > 3 hours late, need back up x 48 hours

Weekly: Patch

- Norelgestromin and EE
  - 20mcg EE & 150mcg norelgestromin
- One patch q week for 3 weeks, then no x 1 wk
- Few side effects – comparable to pills except:
  - 20% skin irritation – 2% stopped method
  - More breast discomfort and spotting in first 2 cycles than pills
  - 3% detached – RCT 46% experience at least one detachment in one cycle
- Prescribe replacement patch

Monthly: Ring

- Ethinyl estradiol and etonogestrel
  - 15 mcg EE & 120 mcg desogestrel
- One ring each month:
  - Ring in x 3 wks
  - Ring out x 1 week
- Few side effects – comparable to pills except
  - Spotting: only 5% (significantly less in first month)
  - Discharge: 1% stop method
  - Discomfort: 2.5% stop method
  - Expulsion: RCT: 20% expelled at least once during 3-week period

Monthly: Extended Cycle Ring

- RCT of 561♀: 4wk, 8 wk, 12 wk, continuous:
  - All regimens well-tolerated
  - Extended: ↓ bleeding days, spotting days
- Potential for use on a monthly basis
  - Serum levels for 35 days

I instruct patients to remove ring the last 3-4 days of the month if they want withdrawal bleed.
Non-oral HC and VTE

2 case-control studies
- No association - new users
  - OR=1.1 (CI 0.6-2.1)  
- Association - all users
  - OR=2.4 (CI 1.1-5.5)

Retro cohort, 9.4 m yrs
- Attributable risk:
  - +7.6/10K (vs. non)
  - +3.5/10K (vs. COC)

EE Exposure with combined hormonal contraception

- Attributable risk:
  - +5.7/10K (vs. non)
  - +1.5/10K (vs. COC)

- NNT (switch to COC):
  - 2000 ring users
  - 1250 patch users
- No info on BMI, smoking, fam hx

Every 3 months: Progestin Injection

- Medroxyprogesterone acetate 150 mg IM
  - One injection every 12-13 weeks
- Very effective
  - Typical use failure = 3%
- Side effects:
  - Delayed return to fertility (9-10 months)
  - Irregular bleeding, amenorrhea (50% at 1 yr)
  - Weight gain (5 lbs at 1 year, 16 lbs at 5 yrs)
- SQ low-dose (104 mg) version now available

Progestin Injection & BMD

- BMD decreases by 1-2% per year
- FDA: limit to 2 yrs. in young women
  - WHO & ACOG do not agree
  - Bone loss reverses by 1 year after discontinuation.
  - No evidence of increased fractures.
- No indication for DEXA
- Weigh risks against risk of pregnancy

Meier, J Clin Endocrin Metab, 2010
Scholes, Epidemiology, 2002
ACOG 2008 Com Opinn 415.
**Progestin Injection: Delay**

- Traditionally recommend caution after > 14 weeks from last DMPA injection
- WHO recommends 4-week grace period
  - Repeat up to 16 weeks

**Missed Hormonal Contraceptives: New Recommendations**

- Guidelines for CHC and DMPA
  - For CHC:
    - The hormone free interval (HFI) not > 7 days
    - In the 1st week
      - Back-up should be used after ≥1 missed dose until 7 days of use occur. Consider EC.
    - In the 2nd and 3rd week
      - If < 3 days are missed, eliminate the next HFI
      - If ≥3 days are missed, back-up contraception and consideration of EC should be added

*Soc Ob GYN of Canada, JOGC 2008; 219:1050-62*

**Every 3 years: Single-Rod Implant**

- Etonogestrel 60mcg/day
- New version replaced old in 2011
  - Identical but with radiopaque rod
  - Easier-to-use inserter
  - Must complete FDA-approved training

- Efficacy > 99%
- 1 year continuation: 75%-90%
  - Reasons for discontinuation: Bleeding (up to 40%)

**Progestin Implant: Side Effects**

- Bleeding: “Irregularly irregular” (40%)
  - Amenorrhea: 22%
  - 7% frequent: > 5 B-S episodes in 90-day period
  - 18% prolonged: at least 1 B-S episode > 14 days
  - 20% have B-S for >50 days in first 90-day period
  - Generally NOT heavy

- Treatment of bleeding
Implant: Bleeding Treatment

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Evidence?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. COC x 21d/7d (3 mo) or Estrogen alone (0.5 mg estradiol x 21 d) (3 mo)</td>
<td>Minimal</td>
</tr>
<tr>
<td>2. Cyclic progestin (MPA 10bid) x 21d/7d (3mo)</td>
<td>Anecdotal</td>
</tr>
<tr>
<td>3. POP daily up to 3 mo</td>
<td>Anecdotal</td>
</tr>
<tr>
<td>4. NSAIDs, COX-2 inhibitors x 5-10d Tranexamic acid 500 bid x 5d</td>
<td>Minimal Anecdotal</td>
</tr>
</tbody>
</table>

Every 3-10 Years: Intrauterine Devices (IUD, IUC, IUD, IUS)

- **Copper T 380A IUD**
  - 0.8% failure (1 yr)

- **Levonorgestrel Intrauterine System (LNG-IUS)**
  - Levonorgestrel 20 mcg/day
  - 0.1% failure (1 yr)
  - New LNG IUS – 13.5 mg/day
  - 3 years

IUD Review

- Current IUDs do NOT cause PID!!!
  - Transient increased risk at time of insertion
  - STI at time of insertion increases risk
  - GC/CT screening can follow CDC guidelines
  - Okay to screen on insertion day – treat if +
- Beyond time of insertion
  - Overall decreased risk with LNG IUS
  - No increased risk with Copper IUD
- Okay to treat for PID with IUD in place

Routine GC/CT screening NOT necessary!

- Retrospective cohort, n=57,728 IUDs
- Evidence-based STI screening, treat if + test

Overall PID risk = 0.54%

- All women: Risk of PID
  - Non-screening = Screening OR= 1.05 (0.78, 1.43)
  - Screened Women: Risk of PID
    - Same day = Pre-insertion OR= 0.997 (0.64, 1.54)

Women appropriately selected for non-screening

Most accurate screening time is day of insertion
IUC, Nulliparity & Infertility

- Nulliparity is not a contraindication
  - May have increased pain with insertion
  - May have increased risk of expulsion
- IUDs do NOT cause infertility
  - Tubal factor 1” infertility is not associated with prior IUD use (OR=1)

Is Jane a candidate for an IUD?

Women of any reproductive age seeking long-term, highly effective contraception

Permanent: Tubal Sterilization

- Postpartum salpingectomy
- Silicone Band (Yoon, Fallope)
- Filshie Clip
- Electrosurgical dessication – unipolar lowest failure

Permanent: Hysteroscopic Tubal Sterilization

- Coils inserted into proximal tubes via hysteroscopy
  - Induces scarring reaction in tubes
- Back-up method required using form w/ HSG
  - Low failure rate (0.26% at 5 yrs)
  - Non-invasive
Post-exposure: Oral Emergency Contraception

Levonorgestrel 120 mg x 1, up to 5 days

Ulipristal Acetate
- Selective progesterone receptor modulator
- Proposed mechanism:¹
  - Delay follicular rupture
- Will not harm existing pregnancy
- Dosing:
  30mg, FDA-approved up to 5 days

¹ Brache 2010

Emergency Contraception: Ulipristal Acetate

Effectiveness:¹,²
“Non-inferior” to LNG: 1.4% vs. 2.2%
Meta-analysis of 3445 ♀
  120 hrs: OR = .55 (.32–.93)
  24 hrs: OR = .35 (.11–.93)

Side effects: Headache (20%), nausea (12%)

¹ Glasier 2010, Lancet
² Creinin 2006, Obstet Gynecol

Alternatives to LNG EC & Ulipristal acetate?

- Copper IUD
  - VERY effective as EC up to 7 days!
  - More effective than LNG EC

- Mifepristone (10, 25 or 50 mg)
  - More effective than LNG

- Yuzpe regimen
  - More side effects and less effective

Jane

- You counsel Jane about the other options available, emphasizing those with high efficacy that require less intervention. She ends up choosing a highly effective IUD which you place that same day.
Summary

• Unintended pregnancy remains a common problem in the US.
• We can minimize barriers to successful contraception.
• Consider including efficacy in your contraception counseling in addition to other priorities of the patient.

References

• Many easily accessible resources exist to help solve contraception quandaries.
  - USMEC: www.cdc.gov
  - ACOG: www.acog.org
  - Association of Reproductive Health Professionals: www.arhp.org
  - UCSF Family Planning Consult Service: (415) 443-6318
  - UCSF Family Planning Consult Service: http://www.cochrane.org/
  - UCSF Family Planning Consult Service: http://www.managingcontraception.com/
  - UCSF Family Planning Consult Service: http://www.who.int/reproductivehealth/publications/family_planning/
  - UCSF Family Planning Consult Service: http://www.reproductiveaccess.org/

Resources

• WHO and US Medical Eligibility Criteria for Contraceptive Use
  – www.who.int
  – www.cdc.gov
  – www.reproductiveaccess.org
• A Pocket Guide to Managing Contraception
• UCSF Family Planning Consult Service
  – (415) 443-6318

Thanks to Carolyn Sufrin for sharing some slides...
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  – Carolyn Sufrin
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  – Sarah Prager