Clinical Update in Intrauterine Contraception

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Training in Reproductive Health Research
WHO 2007
Learning Objectives

• State the efficacy associated with intrauterine contraception as compared to other contraceptive methods.
• List the different categories of IUCs available.
• List selection criteria for appropriate candidates for intrauterine contraception.
• List non-contraceptive uses and benefits of IUC.
• Identify possible side effects of intrauterine contraception.
Why an Update on Intrauterine Contraception?

- Study of 10,683 women having abortions
- 46% not using contraception
- 54% using contraception
  - Method failure
  - Incorrect or inconsistent use: Condoms, OCPs, Withdrawal, Periodic Abstinence

Why an Update on Intrauterine Contraception? (continued)

• Myths exist about intrauterine contraception and selection of candidates is unduly restrictive
• Misinformation about intrauterine contraception is common

Contraceptive Use
Worldwide Use of IUC

Estimated Use Among Married Women of Reproductive Age

% Using IUC

Asia | Europe | Latin America & Caribbean | Africa | Oceania | North America

IUC use by Female Ob/Gyns and IUC use by All Women in the United States

Why IUC is Underutilized

• Dearth of trained and willing professionals to insert devices
• Negative publicity about method
• Misconceptions by health care providers and the public
• Access issues in some countries; litigation worries in others

Overview of Intrauterine Contraception
Characteristics of IUC

- Highly effective
- Long term protection
- Immediately effective
- Safe
- Rapid return of fertility
- Highest patient satisfaction among methods

Former Methods of IUC Worldwide
Examples of Available Methods of IUC

Copper T 380A IUD
- Copper ions
- Approved for 10 years use
- Failure 0.8% first year of use
- Ten year failure <3%

LNG IUS
- 20 mcg levonorgestrel/day
- Approved for 5 years use
- Failure 0.1% first year
- 5 year failure 0.7%
Which copper-containing device?

• Effectiveness varies by amount of copper
  – Cumulative pregnancy 5.8 for TCu220 versus 2.2 TCu380 over 12 years
  – Copper-loading on arms increases efficacy
• Expulsion rates lower for T-shaped devices
• Performance unchanged by age or parity
• TCu380A overall performed better than other devices, and easier to insert than TCu380S

Kulier, et al Cochrane Database of Systematic Reviews, 2006
Efficacy: IUC is Comparable to Sterilization

5-year gross cumulative failure rate

Efficacy: 1st Year Failure Rates of Select Contraceptives (Typical Use)

Injectable (DMPA)

IUD-CuT

Pill - Combined

Pill - Progestin Only

Condom - Male

Spermicides

No Contraception

Adapted from Trussell J, Vaughan B. *Fam Plann Perspect.* 1999.
Dispelling Common Myths About IUC

• In fact:
  – ARE NOT abortifacients
  – DO NOT cause ectopic pregnancies
  – DO NOT cause pelvic infection
  – DO NOT decrease the likelihood of future pregnancies
Mechanism of Action

• Copper IUC:
  - Contraceptive effectiveness is enhanced by continuous copper release
  - Intense copper and foreign-body reaction which is spermicidal
  - Effect occurs before ova reaches uterus
  - Few, if any, sperm reach the fallopian tubes
  - Endometrial inflammation prevents implantation (secondary action)

• LNG IUS:
  - Thickened cervical mucus
  - Sperm motility inhibited
  - Endometrium suppressed
  - Weak foreign body reaction
IUCs are Not Abortifacients

• Following insemination sperm are not present in the tubes of IUD users
• Absence of hCG in the serum of 30 IUD users over 30 months
• Absence of normal, fertilized ova in flushed fallopian tubes of IUD users
• Reduced ectopic pregnancy rate

• Tredway, AmJOG 1975
• Segal, Fertil Steril 1985
• Alvarez, Fertil Steril 1988
Recovery of Tubal Sperm after Salpingectomy 2-36 Hours After Midcycle Coitus

<table>
<thead>
<tr>
<th></th>
<th>Control (n=30)</th>
<th>Loop IUD (n=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical mucus sperm</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Tubal sperm</td>
<td>14</td>
<td>0</td>
</tr>
</tbody>
</table>

## Rate of Ectopic Pregnancy:

### Rate Per 1000 Woman-Years

<table>
<thead>
<tr>
<th>Method</th>
<th>Rate of Ectopic Pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrauterine Copper Contraceptives (380 mm² of copper surface)</td>
<td>0.2</td>
</tr>
<tr>
<td>Levonorgestrel-releasing intrauterine contraceptive (20 mcg)</td>
<td>0.2</td>
</tr>
<tr>
<td>Cohabiting, non-contraceptors</td>
<td>3.25-4.50</td>
</tr>
</tbody>
</table>

Safety: IUCs Do Not Cause PID

- PID incidence for IUC users similar to general population
- Increased risk only during first month after insertion
- *Preexisting STI at time of insertion, not the IUD itself, increases risk*

Rate of PID by Duration of IUC Use

n=\sim 20,000 \text{ women.}

## Safety: IUC Use Compared with Pregnancy and Abortion

<table>
<thead>
<tr>
<th>Event</th>
<th>Chance of Death in a year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk for women preventing pregnancy using IUC</td>
<td>1 in 10,000,000</td>
</tr>
<tr>
<td>Risk per pregnancy from continuing pregnancy beyond 20 weeks</td>
<td>1 in 10,000</td>
</tr>
<tr>
<td>Risk from terminating pregnancy with legal abortion before 12 weeks</td>
<td>1 in 181,000</td>
</tr>
</tbody>
</table>

Safety: Fertility in Parous Women After Discontinuation of Contraceptive

Potential Side Effects

• During insertion
  – Variable pain and/or cramping
  – Vasovagal reactions

• First few days:
  – Light bleeding and mild cramping

• First few months
  – Intermenstrual bleeding, cramping

• CuT IUD: Heavier or prolonged menses

• LNG IUS: spotting, lighter menses
  – 20% amenorrhea at one year

Side Effects and Complications

• Side effects
  – Menstrual effects
  – LNG IUS may have hormonal side effects

• Possible complications
  – Infection
  – Perforation
  – Pregnancy
  – Expulsion
  – Missing String
Comparison: Number of Bleeding Days

Days

Month

Copper IUD

LNG IUS

Luukkainen et al., (1992)
Cost-Effectiveness
Cumulative Costs of Selected Methods

- Male Condom
- Implant
- Oral Contraceptives
- Spermicides
- Injectable
- Copper-T IUD
- Vasectomy
- Tubal Ligation

Trussell, *Family Planning Perspectives* 1997
Non-Contraceptive Uses
Non-contraceptive uses: Endometriosis

• After primary surgery for endometriosis
  – Significant reduction symptoms for the LNG-IUS group compared with GnRH agonist (OR 0.14, 95% CI = 0.02 to 0.75)
  – More patients were satisfied with their treatment results in the LNG-IUS group (75%, 15/20) than in the control group (50%, 10/20)
  – Another study demonstrated efficacy starting LNG-IUD 2 years after surgery
    • Benefit of intervention every 5 years, normal estrogen levels, compared to those on GnRH treatment

Vercellini, 2003
Petta, 2005
Non-contraceptive use: Menorrhagia

• LNG IUS more effective than cyclical norethisterone
  – Women with an LNG IUS are more satisfied
    • Experience more side effects; intermenstrual bleeding and breast tenderness.

• Compared to endometrial ablation, the LNG IUS
  – Results in a smaller mean reduction in menstrual blood loss
    • Satisfaction is the same in both groups

• Compared to immediate hysterectomy
  – The LNG-IUS treatment costs less than hysterectomy
  – 20% of LNG-IUS users had undergone hysterectomy at one year, and 40% at 5 years
  – No difference in measured quality of life

Lethaby, et al. *Cochrane Database of Systematic Reviews* 2007
## Non-contraceptive Benefits of Intrauterine Contraception

<table>
<thead>
<tr>
<th></th>
<th>Protection against endometrial cancer</th>
<th>Alternative to hysterectomy or endometrial ablation</th>
<th>Treatment of menorrhagia/dysmenorrhea</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Copper T IUD</strong></td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LNG IUS</strong></td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>

Crosignani et al. *Obstet Gynecol* 1997
Patient Screening and Counseling for Intrauterine Contraception
Screening: Appropriate Candidates for Intrauterine Contraception

‘Women of any reproductive age seeking long-term, highly effective contraceptive’

-Stephanie Teal, MD, MPH
ARHP September 2004
IUC Candidates

• **Refrain:**
  – Active, recent (3 months), or recurrent infection: PP endometritis, post-septic abortion, active STIs, purulent cervicitis or pelvic TB
  – Pregnancy
  – Distorted uterine cavity
  – Untreated cervical cancer, uterine cancer or malignant GTD or undiagnosed pathologic vaginal bleeding
  – Wilson’s disease (copper T)
  – For LNG IUD: breast cancer

• **Exercise caution:**
  – High risk for PID/STD (condoms recommended)
  – Impaired response to infection
  – For LNG IUD: migraine with aura, current DVT, heart disease, liver tumour/cirrhosis, past breast cancer

WHO Medical Eligibility Criteria for Contraceptive Use, 2004
IUC Candidates

• Advantages outweigh disadvantages:
  – Valvular heart disease
  – Uterine fibroids without cavity distortion
  – Prolonged menses
  – Nulliparous women

• Not restricted:
  – Prior PID
  – Past ectopic
  – Irregular menses
  – Expulsion and patient would like to try again

WHO Medical Eligibility Criteria for Contraceptive Use, 2004
Insertion Following Spontaneous or Induced Abortion

• May be safely inserted immediately following spontaneous or induced abortions
  – No increase in PID or perforation rates
  – Expulsion rates higher in immediate placement (1.9% in 3 months) versus interval, <13 wks
    • 43% of women didn't return for interval placement
    • Higher rates after second trimester abortion (19%)
  – T-shaped devices had half the rate of pregnancy and expulsion
• Do not use after septic abortion

IUC for Postpartum Women

May be safely inserted in postpartum women, without increasing bleeding or infection rates

• Immediately postpartum
  – After vaginal delivery, within 48 hours of placental expulsion
    • Lower expulsion rates if within 10 minutes (9% vs 16-30%)
  – Immediately after placental removal in caesarean section (4-10% at 6 months)

• Or starting at 4 weeks postpartum once uterus is involuted

IUC Use During Lactation

• For Copper IUDs:
  – Effectiveness not decreased
  – Uterine perforation unchanged
  – Expulsion rates unchanged
  – Decreased insertional pain
  – Reduced rate of removal for bleeding and pain

• Do not have similar data for LNG-IUS

IUD Candidates: HIV Positive Women

• No increased risk of complications compared with HIV negative women
  – No increase in PID
• No increased cervical viral shedding
• In AIDS
  – If clinically well, on ARVs, IUDs may be used

WHO. Medical Eligibility Criteria for Contraceptive Use.
Richardson et al. AIDS 1999.
IUD Insertion and Management
### Timing of Insertion

<table>
<thead>
<tr>
<th>Timing</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>With menses</td>
<td>Ensures patient not pregnant</td>
<td>Scheduling; interim pregnancy</td>
</tr>
<tr>
<td>Mid-cycle/Anytime</td>
<td>Convenience; low expulsion rate</td>
<td>Must rule out pregnancy</td>
</tr>
</tbody>
</table>

Prophylactic Antibiotics Before Insertion

- Has not been shown to reduce risk of PID when given prophylactically

Cu 380A Gross Removal and Continuation Rates

<table>
<thead>
<tr>
<th>Event</th>
<th>Rate (per 100 parous users at 1 yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection</td>
<td>0.3</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>0.5</td>
</tr>
<tr>
<td>Other medical</td>
<td>0.5</td>
</tr>
<tr>
<td>Planning pregnancy</td>
<td>0.6</td>
</tr>
<tr>
<td>Other personal</td>
<td>0.7</td>
</tr>
<tr>
<td>Expulsion</td>
<td>2.3</td>
</tr>
<tr>
<td>Bleeding/pain</td>
<td>3.4</td>
</tr>
<tr>
<td>Continuation</td>
<td>92.1</td>
</tr>
</tbody>
</table>

Manufacturer’s prescribing information.
# Signs of Possible Complications

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe bleeding or abdominal cramping 3 – 5 days post-insertion</td>
<td>Perforation, infection</td>
</tr>
<tr>
<td>Irregular bleeding and/or pain every cycle</td>
<td>Dislocation or perforation</td>
</tr>
<tr>
<td>Fever, chills, unusual vaginal discharge</td>
<td>Infection</td>
</tr>
</tbody>
</table>
## Signs of Possible Complications
(continued)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain during intercourse</td>
<td>Infection, perforation, partial expulsion</td>
</tr>
<tr>
<td>Missed period, other signs of pregnancy, expulsion</td>
<td>Pregnancy (uterine or ectopic)</td>
</tr>
<tr>
<td>Shorter, longer or missing strings</td>
<td>Partial or complete expulsion, perforation</td>
</tr>
</tbody>
</table>
Management of Cramping

• Mild:
  – Consider NSAIDs

• Severe or prolonged:
  – Examine for partial expulsion, perforation, or PID
  – Remove IUD if severe cramping is unrelated to menses or unacceptable to patient
Expulsions

- Partial or unnoticed expulsion may present as irregular bleeding and/or pregnancy
- Risk of expulsion related to:
  - Provider’s skill at fundal placement
  - Age and parity of woman
  - Time since insertion
  - Timing of insertion
Management of Heavy Bleeding Lasting More Than 3 Months

- Examine for infection or fibroids
- Check for signs of anemia and treat, if needed
- Consider NSAIDs
- Remove device if medical indication or unacceptable to patient
Management of Missing String

- Rule out pregnancy
- Probe for strings in cervical canal
- Prescribe back-up contraceptive method
- Obtain ultrasound or x-ray, as needed
- IUD in abdomen should be removed promptly
Risk of Uterine Perforation

• Rare: 1/1000 insertions
• Linked to:
  – Uterine position and consistency
  – Skill/experience of provider with technique required
  – Time of insertion after childbirth
• Reduced through directed training and observation

Management of Perforation at Insertion

- If perforation occurs at insertion:
  - Remove device
  - Provide alternative contraception
  - Monitor for excessive bleeding
  - Follow up as appropriate
  - Can insert another device after next menses
Pregnancy With IUC In Situ

- Determine site of pregnancy (intrauterine or ectopic)
- Remove IUD in intrauterine pregnancy if strings available
- Removal decreases risk of
  - Spontaneous abortion
  - Premature delivery

Summary

- Efficacy equivalent to sterilization
- Proven safety
- Broader options for insertion timing
- Can be inserted after abortion or delivery
- Cost effective