# Clinical Update in Intrauterine Contraception

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# 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

RK Jones et al. Perspectives on Sexual and Reproductive Health, 2002, 34(6):294

# Why an Update on Intrauterine Contraception? (continued)

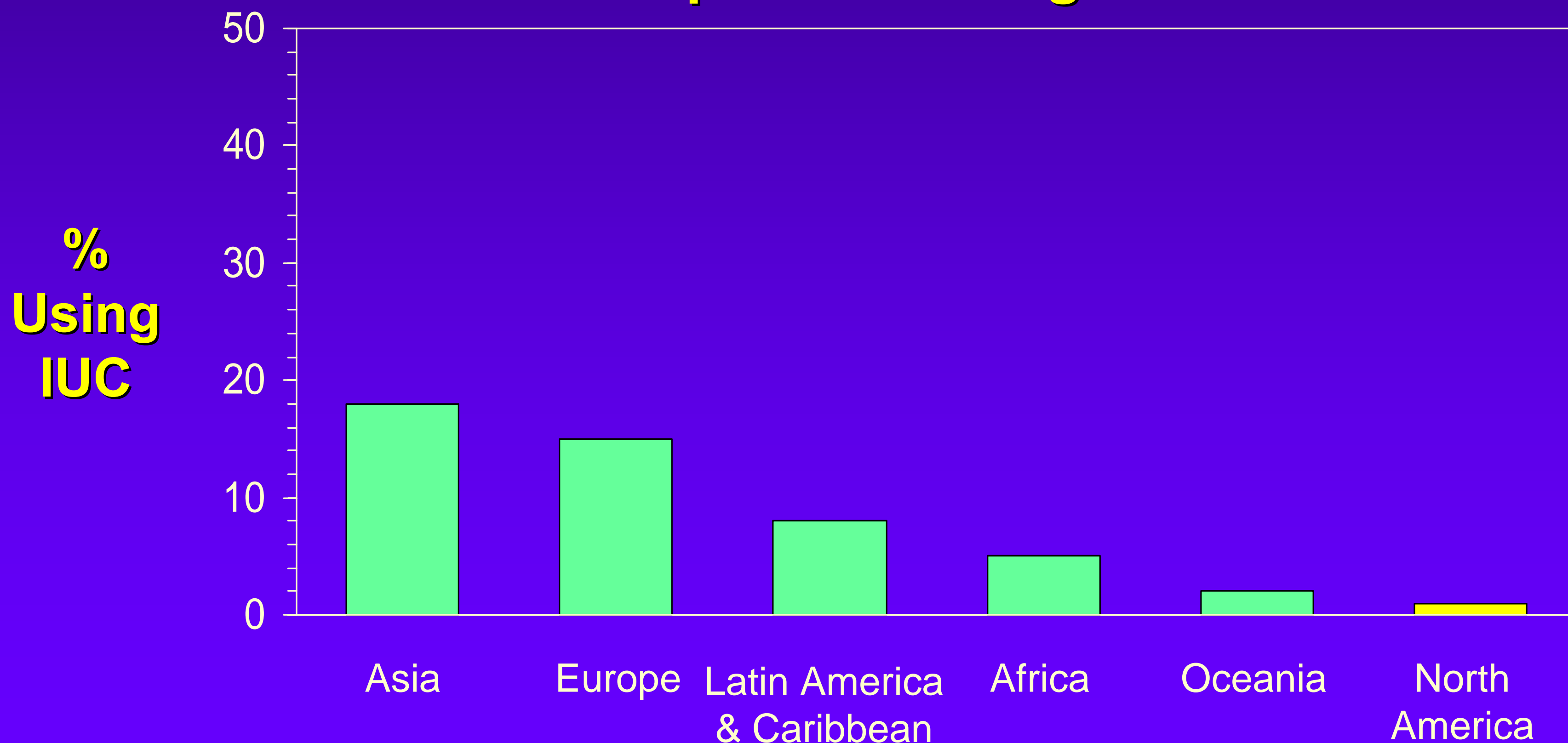
- Myths exist about intrauterine contraception and selection of candidates is unduly restrictive
- Misinformation about intrauterine contraception is common

Stanwood, NL. *Obstet Gynecol* 2002.
Weiss E et al. *Contraception*. 2003.

# *Contraceptive Use*

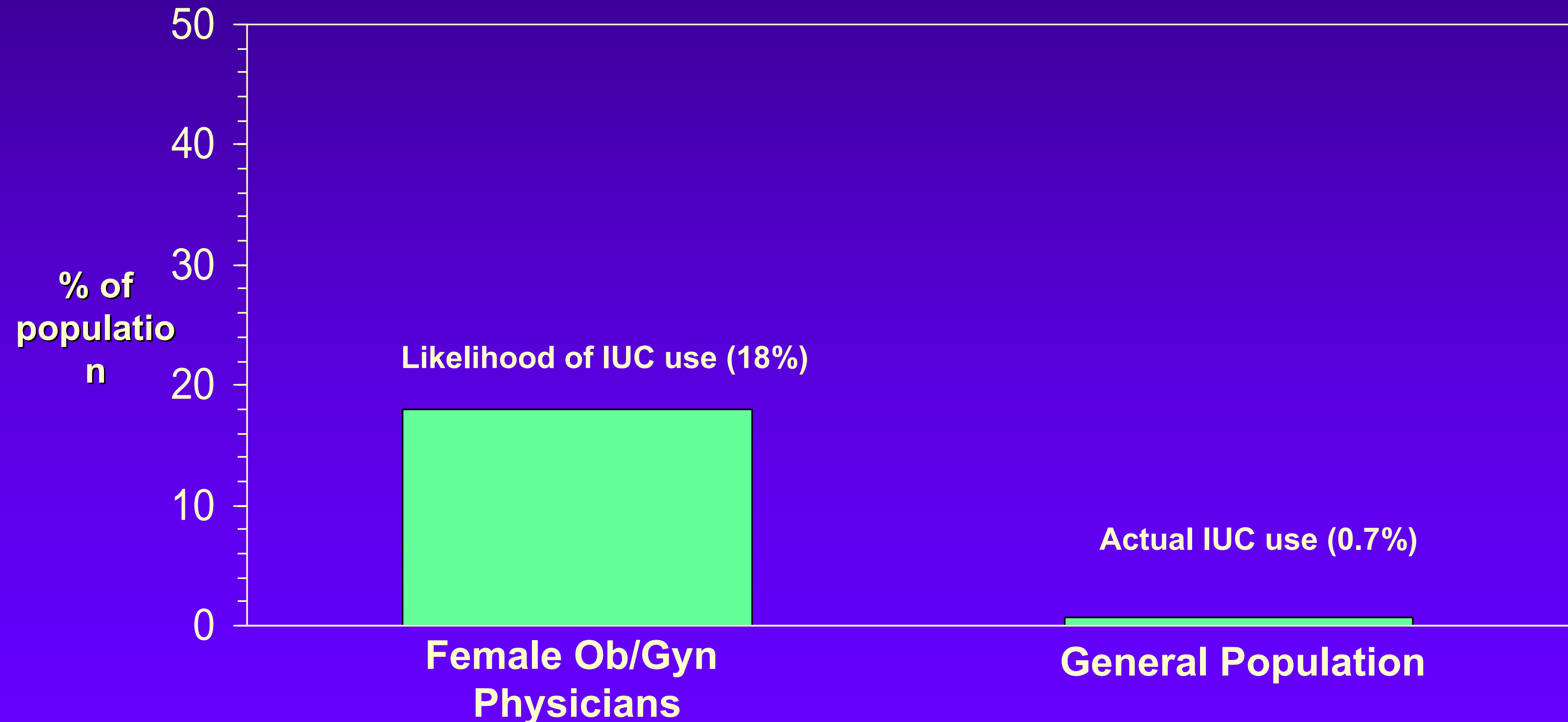
# Worldwide Use of IUC

**Estimated Use Among Married Women of Reproductive Age**




Population Reference Bureau, 2002.

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




Population Reference Bureau, 2002.; The Gallup Organization, 2004.

# 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

Weir. *CMAJ* 2003.
Stanwood, NL. *Obstet Gynecol* 2002.
Steinauer JE. *Family Planning Perspectives* 1997.

#### *Overview of Intrauterine Contraception*

# Characteristics of IUC

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

Belhadj H, et al. *Contraception*. 1986.
Skjeldestad F, Bratt H. *Advances in Contraception*. 1988.
Arumugam K, et al. *Med Sci Res*. 1991.
Tadesse E. *Easr Afr Med J*. 1996.

# 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**

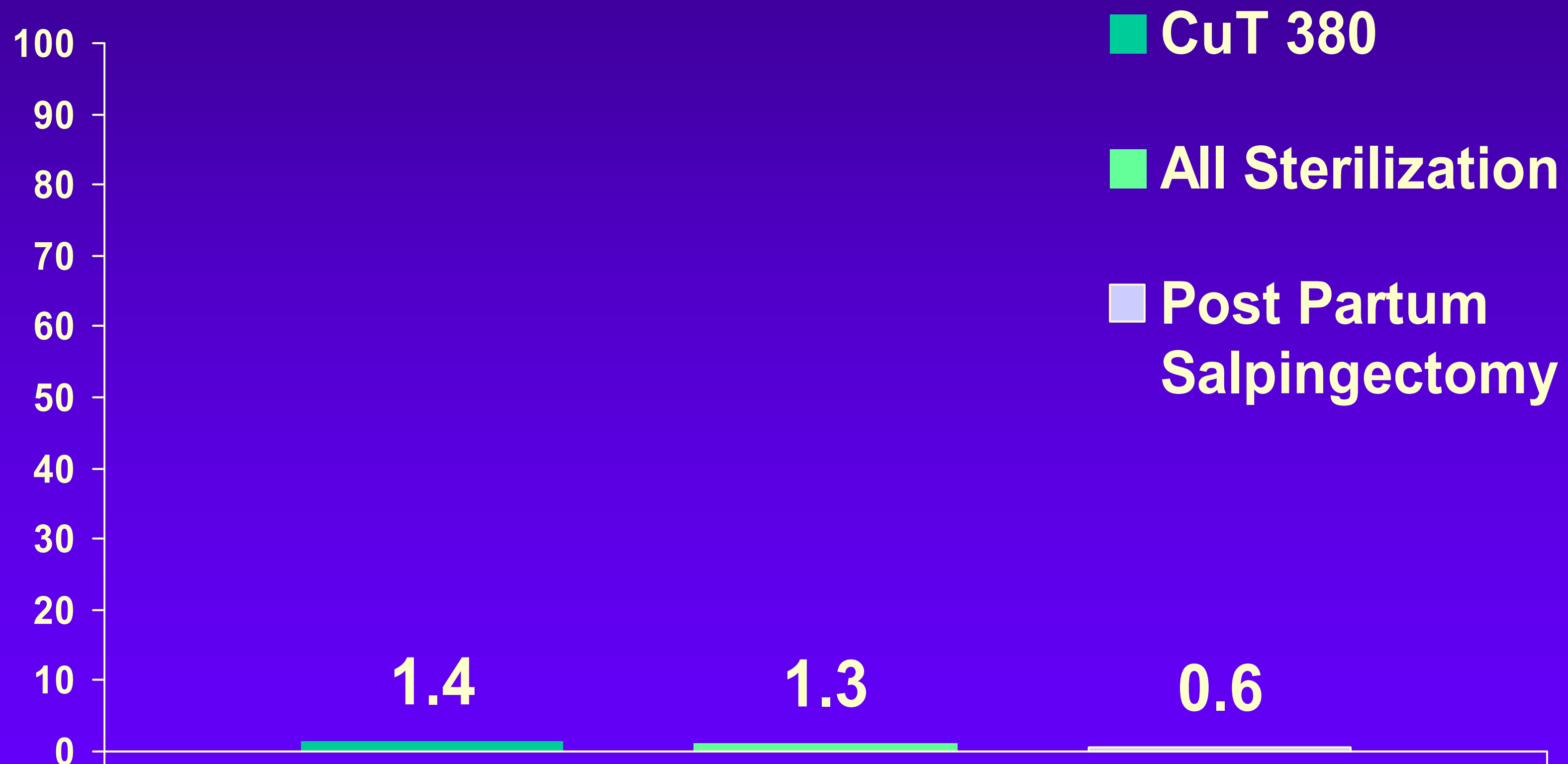
- 20 mcg levonorgestrel/day
- Approved for 5 years use
- Failure 0.1% first year
- 5 year failure 0.7%

# 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

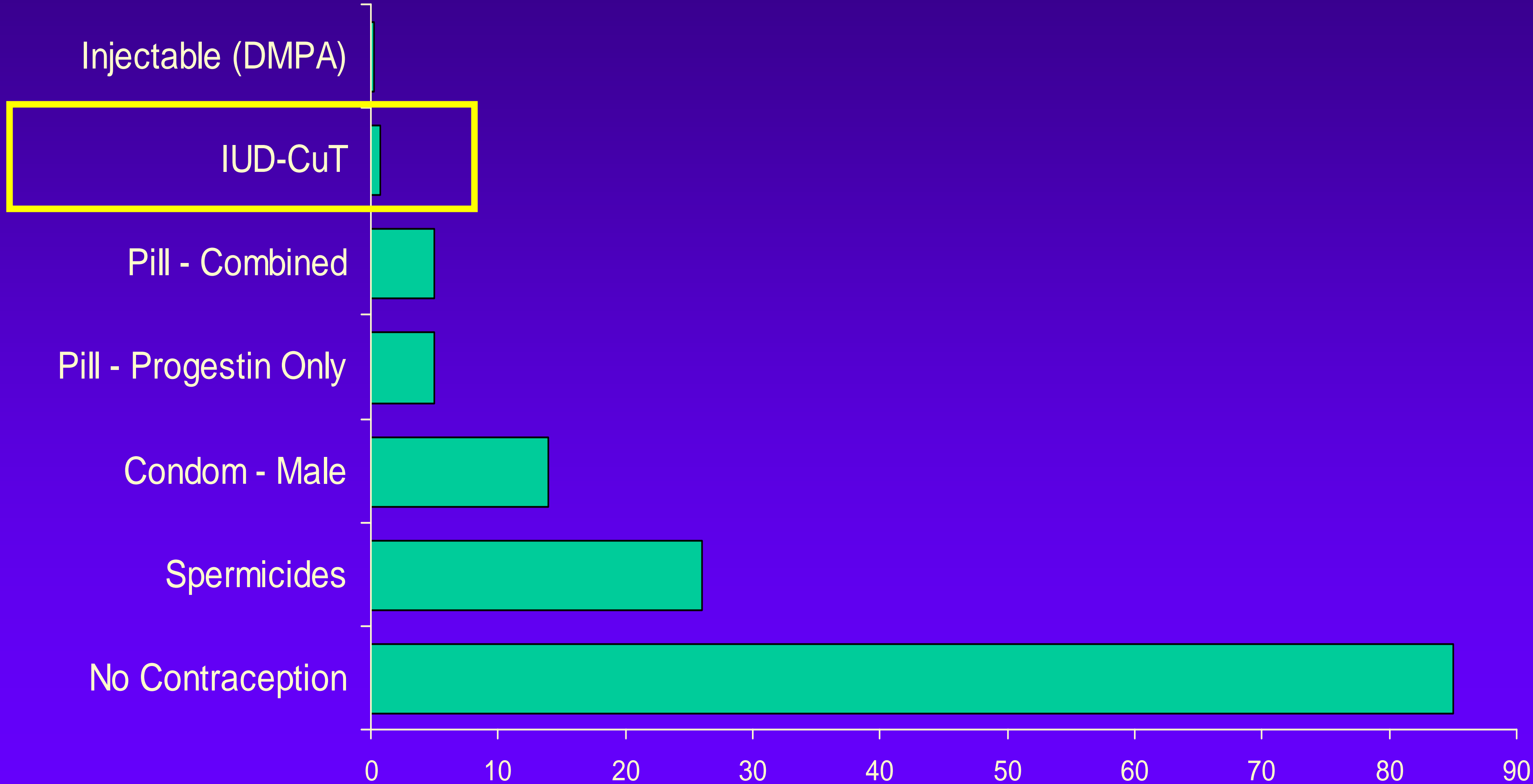
# Efficacy: IUC is Comparable to Sterilization




WHO. *Mechanism of Action, Safety, and Efficacy of Intrauterine Devices.* 1987.

Peterson, et al. *Am J Obstet Gynecol* .1996.

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




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

| | Control (n=30) | Loop IUD (n=30) |
|---|---|---|
| Cervical mucus sperm | 30 | 30 |
| Tubal sperm | 14 | 0 |

El-Habashi M, et al. *Contraception*. 1980.

# Rate of Ectopic Pregnancy:

## Rate Per 1000 Woman-Years

| Method | Rate of Ectopic Pregnancy |
|---|---|
| Intrauterine Copper Contraceptives (380 $mm^2$ of copper surface) | 0.2 |
| Levonorgestrel-releasing intrauterine contraceptive (20 mcg) | 0.2 |
| Cohabiting, non-contraceptors | 3.25-4.50 |

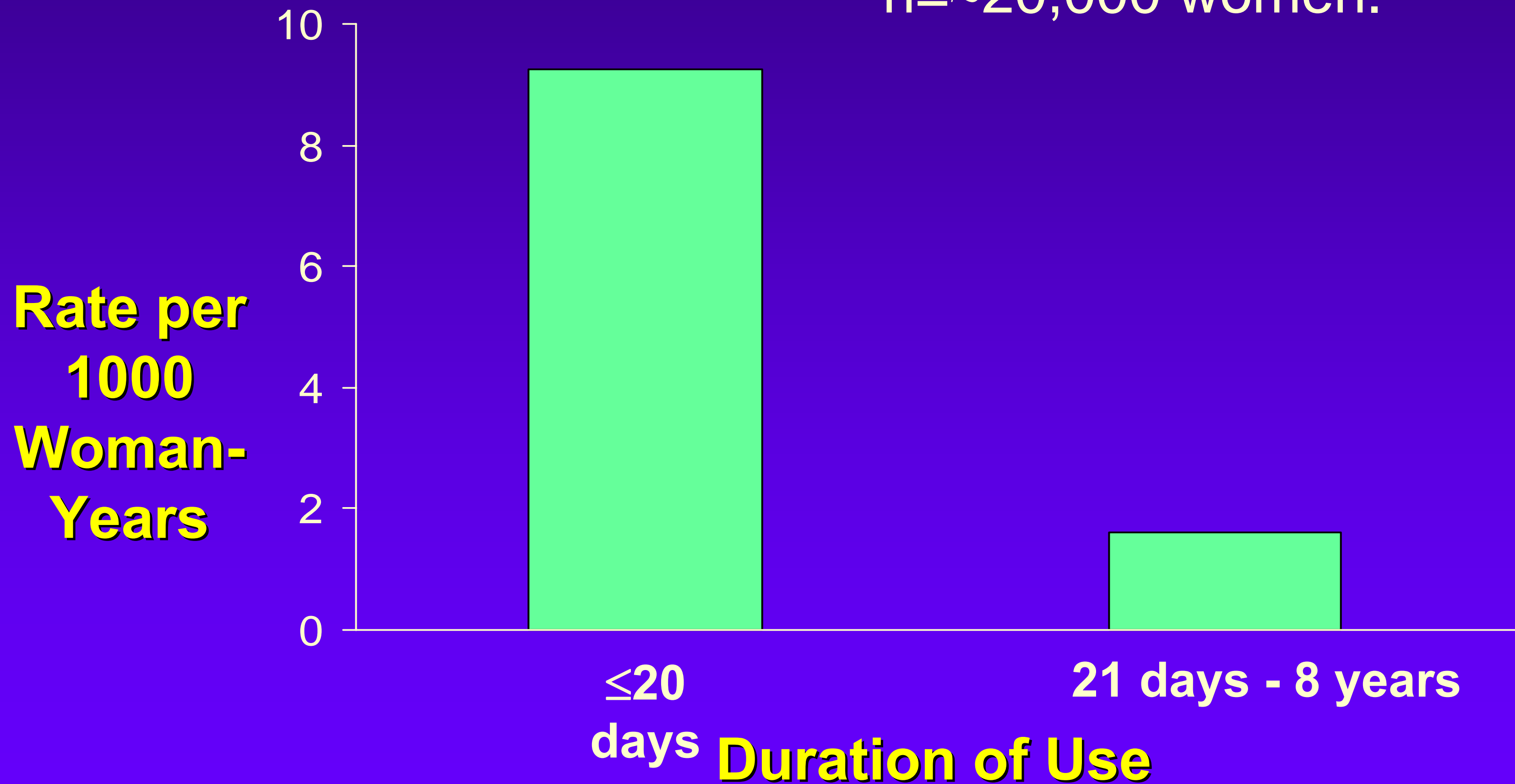
Sivin I. *Obstet Gynecol.* 1991;78:291-298

# 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*

Svensson L, et al. *JAMA* 1984.
Sivin I, et al. *Contraception* 1991.
Farley T, et al. *Lancet* 1992.

# Rate of PID by Duration of IUC Use



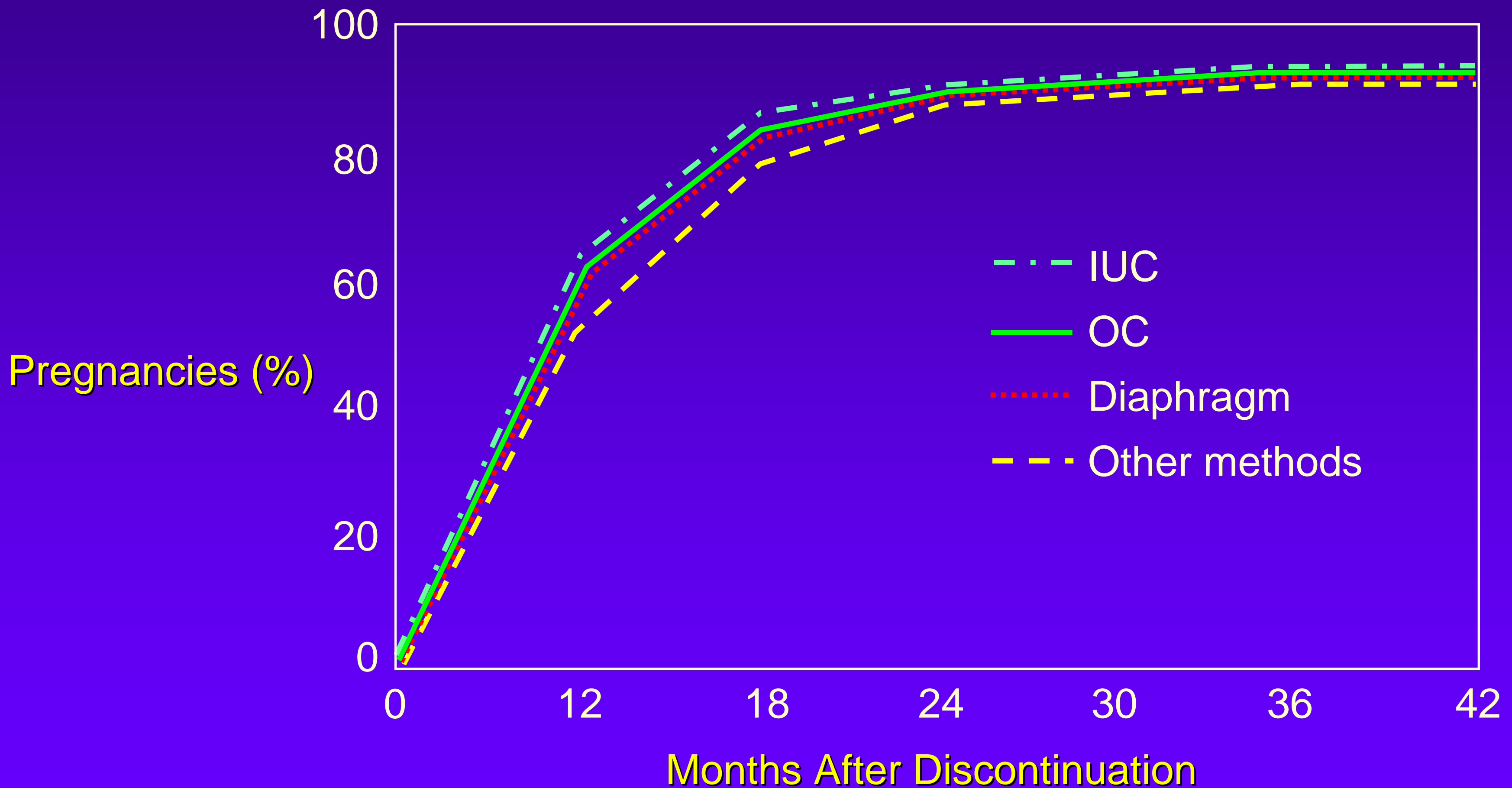

Adapted from Farley T, et al. *Lancet*. 1992;339:785-788.

# Safety: IUC Use Compared with Pregnancy and Abortion

| Event | Chance of Death in a year |
|---|---|
| Risk for women preventing pregnancy using IUC | 1 in 10,000,000 |
| Risk per pregnancy from continuing pregnancy beyond 20 weeks | 1 in 10,000 |
| Risk from terminating pregnancy with legal abortion before 12 weeks | 1 in 181,000 |

Koonin LM, et al. *MMWR CDC Surveill Summ*. 1997.
Lawson, et al. *Am J Obstet Gynecol*. 1994.
Lee. 1981.

# Safety: Fertility in Parous Women After Discontinuation of Contraceptive




Based on data from Vessey MP, et al. *Br Med J.* 1983;286:106.

# Potential Side Effects

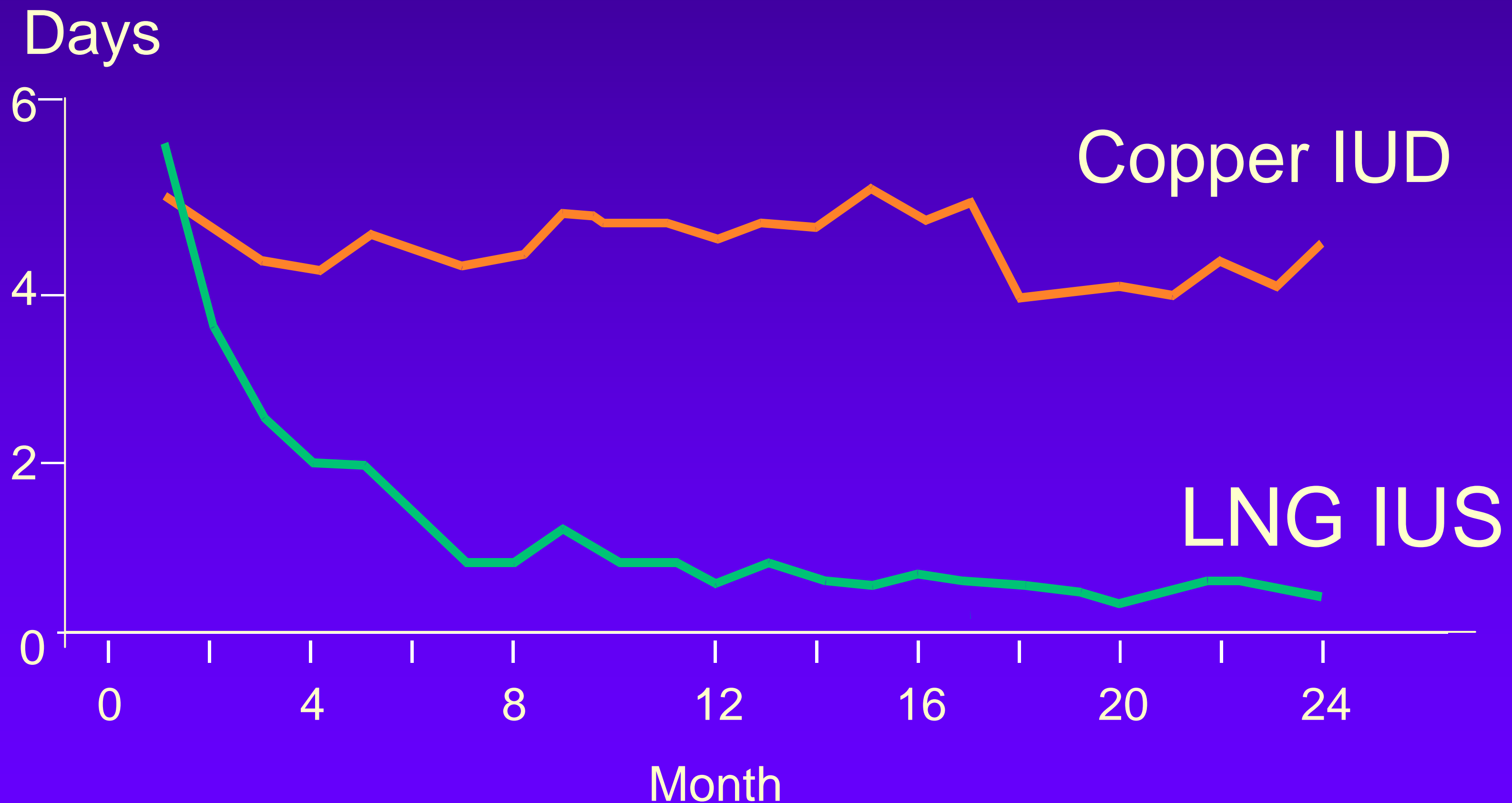
- During insertion
  - Variable pain and/or cramping
  - Vasovagal reactions
- First few days:
  - Light bleeding and mild cramping
- First few months
  - Intermenstrual bleeding, cramping
- CuT IUD: Heavier or prolonged menses
- LNG IUS: spotting, lighter menses
  - 20% amenorrhea at one year

Sivin et al. *Contraception* 1991.
Silverberg et al. *Int J Gynecol Pathol* 1986.

# Side Effects and Complications

- Side effects
  - Menstrual effects
  - LNG IUS may have hormonal side effects
- Possible complications
  - Infection
  - Perforation
  - Pregnancy
  - Expulsion
  - Missing String

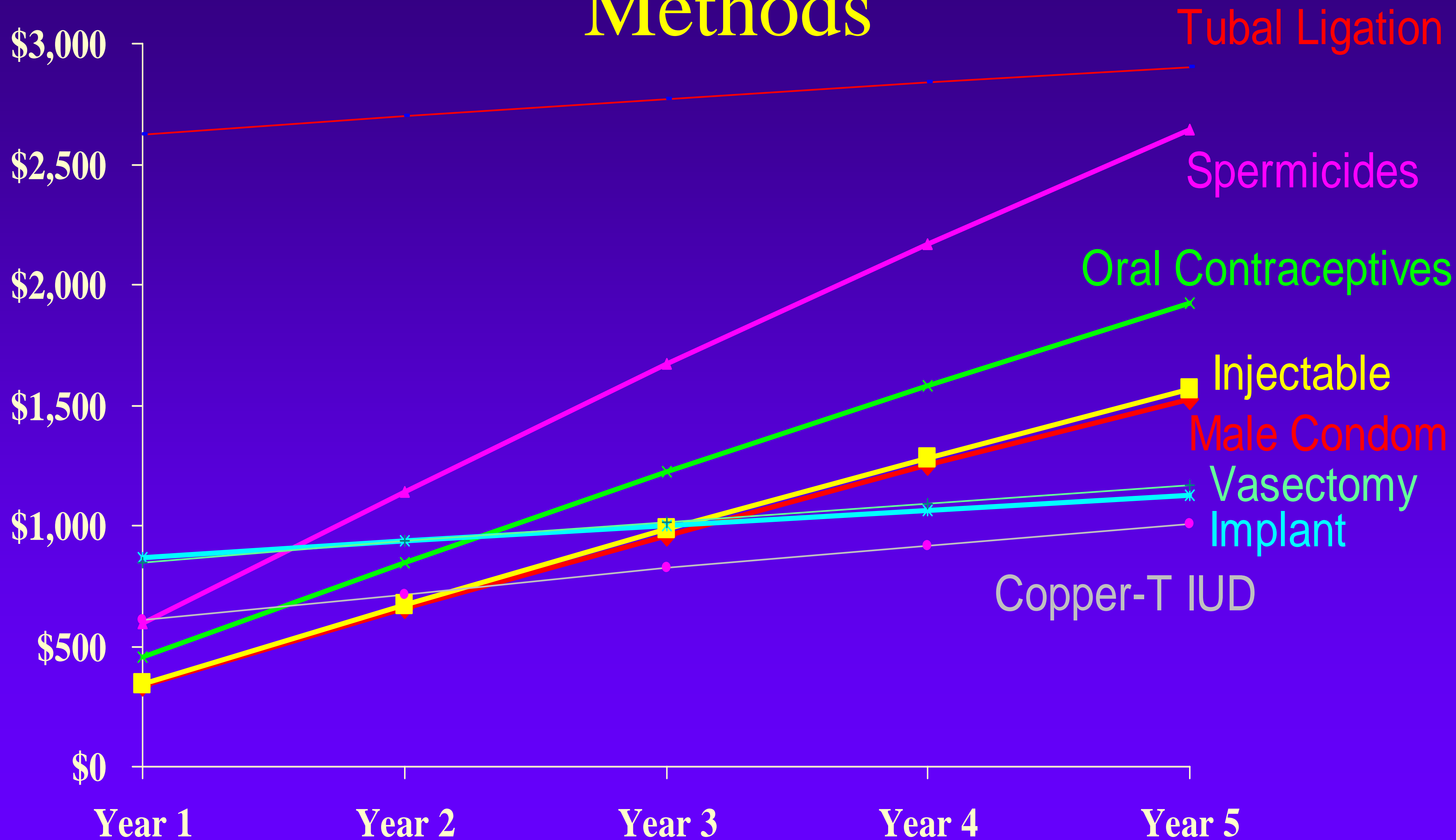
# Comparison: Number of Bleeding Days




Luukkainen et al., (1992)

*Cost-Effectiveness*

# Cumulative Costs of Selected Methods




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

| | Protection against endometrial cancer | Alternative to hysterectomy or endometrial ablation | Treatment of menorrhagia/ dysmenorrhea |
|---|---|---|---|
| **Copper T IUD** | √ | | |
| **LNG IUS** | √ | √ | √ |


Hubacher D, et al. *Obstet Gynecol Surv* 2002.
Hurskainen, et al. *Lancet*. 2001.
Andersson JK, et al.. *Br J Obstet Gynaecol*. 1990.
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

Grimes D, et al. Cochrane Library, 2006.

# 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

Zhou, et al *Intl J Gynecol Obstet*, 1991
Treiman K, et al. *Population Reports*. 1995.
Mishell DR Jr, Roy S. *Am J Obstet Gynecol*.1982;143:29.

# 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

Chi I-C, et al. *Contraception*. 1989;39:603.

# 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.
Morrison. *BJOG* 2001.
Richardson et al. *AIDS* 1999.
Sinei et al. *Lancet* 1998.
European Study Group on Heterosexual Transmission of HIV. *BMJ* 1992.

# *IUD Insertion and Management*

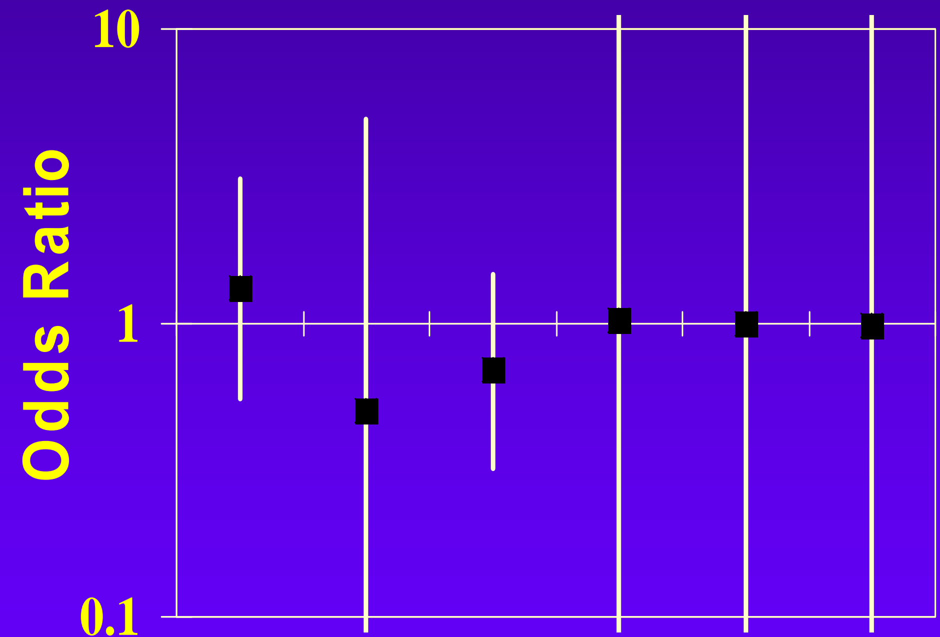
# Timing of Insertion

| Timing | Pros | Cons |
|---|---|---|
| With menses | Ensures patient not pregnant | Scheduling; interim pregnancy |
| Mid-cycle/ Anytime | Convenience; low expulsion rate | Must rule out pregnancy |

Alvarez PJ. *Ginecol Obstet Mex* 1994.
O'Hanley K, et al. *Contraception* 1992.

# Prophylactic Antibiotics Before Insertion

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




Grimes, et al. *Contraception* 1999.

# Cu 380A Gross Removal and Continuation Rates

| Event | Rate (per 100 parous users at 1 yr) |
|---|---|
| **Infection** | **0.3** |
| **Pregnancy** | **0.5** |
| **Other medical** | **0.5** |
| **Planning pregnancy** | **0.6** |
| **Other personal** | **0.7** |
| **Expulsion** | **2.3** |
| **Bleeding/pain** | **3.4** |
| **Continuation** | **92.1** |

Manufacturer's prescribing information.

# Signs of Possible Complications

| **Symptom** | **Possible Explanation** |
| --- | --- |
| Severe bleeding or abdominal cramping 3 – 5 days post-insertion | Perforation, infection |
| Irregular bleeding and/or pain every cycle | Dislocation or perforation |
| Fever, chills, unusual vaginal discharge | Infection |

# Signs of Possible Complications
(continued)

| **Symptom** | **Possible Explanation** |
| --- | --- |
| Pain during intercourse | Infection, perforation, partial expulsion |
| Missed period, other signs of pregnancy, expulsion | Pregnancy (uterine or ectopic) |
| Shorter, longer or missing strings | Partial or complete expulsion, perforation |

# 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


Caliskan E, et al. *Eur J Contracept Reprod Health Care.* 2003.
Grimes, et al. Cochrane Library, 2001, Issue 2.
Markovitch O, et al. *Contraception* 2002.
Harrison-Woolrych M, et al. *Contraception* 2003.

# 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

UK Family Planning Research Network. *Br J Fam Plann.* 1989.
Foreman et al. *Obstet Gynecol.* 1981.

# Summary

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