

Harvard-MIT Division of Health Sciences and Technology
HST.071: Human Reproductive Biology
Course Director: Professor Henry Klapholz

CONTRACEPTION

CONTRACEPTION

- Ebers Papyrus (1550 BC)
- Pliny the Elder (23-79 AD)
- Dioscorides (58-64 AD)
- Soranus (100 AD)
- Al-Razi (923 AD)
- Ali ibn Abbas (994 AD)
- Avicenna (1037 AD)

CONTRACEPTION

- Lactational control of fertility

- >> Darwin (1809-1882)

- >> KORAN (2:233)

- “Mothers shall give suck to their offspring for two whole years if they desire to complete the term”

- >> Stillborn = = => pregnancy interval interval reduced

- >> Higher fertility among users of “wet nurses”

- >> Patterns changed around 1750

LAM: Mechanisms of Action

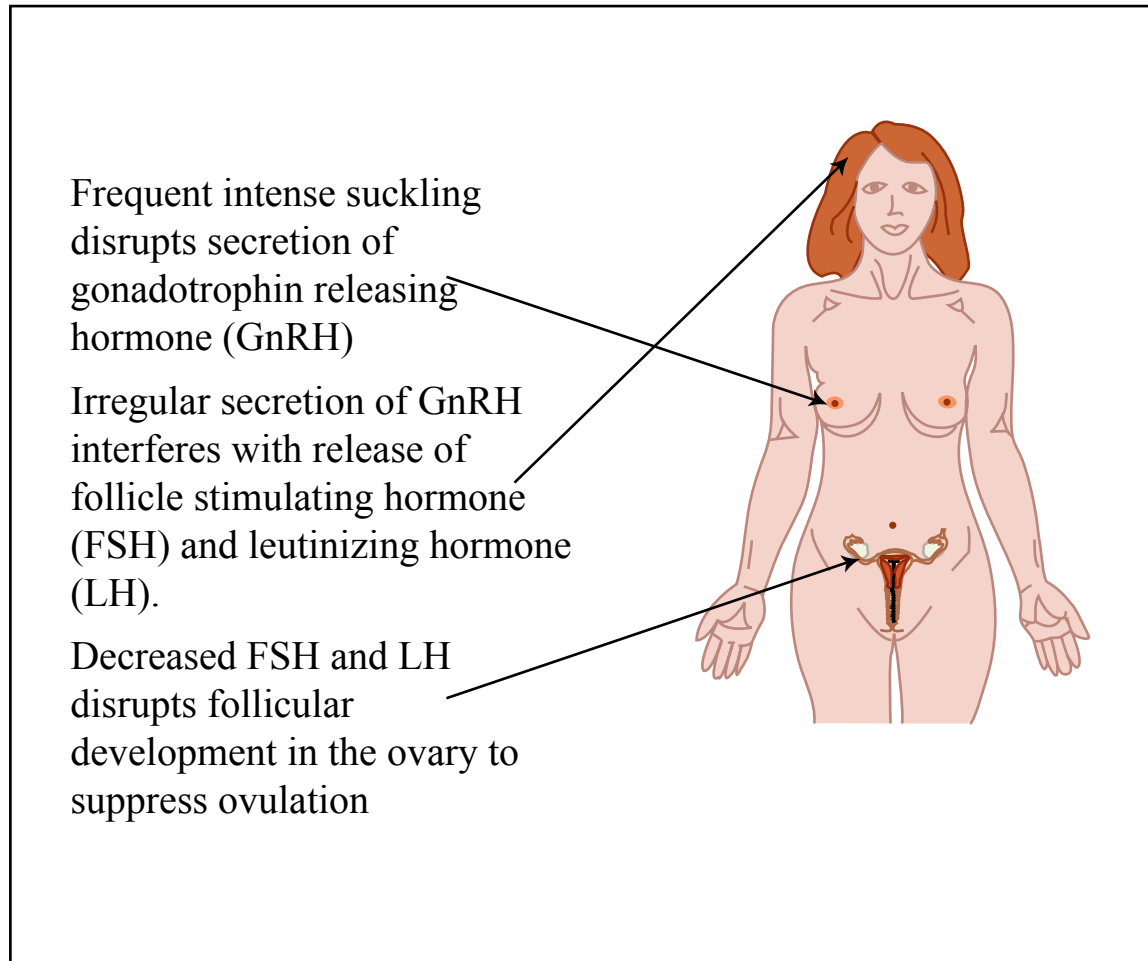


Figure by MIT OCW.

LAM: Contraceptive Benefits

- Effective (1.5 pregnancies per 100 women during first 6 months of use)
- Effective immediately
- Does not interfere with sexual intercourse
- No systemic side effects
- No medical supervision necessary
- No supplies required
- No cost involved

LAM: Noncontraceptive Benefits

- For child:
 - Passive immunization and protection from other infectious diseases
 - Best source of nutrition
 - Decreased exposure to contaminants in water, other milk or formulas, or on utensils
- For mother:
 - Decreased postpartum bleeding

LAM: Limitations

- User-dependent (requires following instructions regarding breastfeeding practices)
- May be difficult to practice due to social circumstances
- Highly effective only until menses return or up to 6 months
- Does not protect against STDs (e.g., HBV, HIV/AIDS)

Who Can Use LAM

Women who:

- Are fully or nearly fully breastfeeding
- Have not had return of menses
- Are less than 6 months postpartum

¹WHO recommends supplementation at 6 months. If begun earlier, LAM is not as effective.

CONTRACEPTION

- Infanticide

- >> opiates, gin, too little food, smothering
common in 18th century

- >> Abandonment

- >> Foundling Hospital (Coram 1741)

- 10,204/14934 infants admitted died

- Majority were illegitimate children

- 50% of all legitimate births of mothers with 6 or more children

CONTRACEPTION

- Reasonable at the time
 - >> wiping out the vagina
- Reasonable but ineffective
 - >> honey, pepper, alum, lactic acid as pessaries & barriers
- Totally unreasonable and ineffective
 - >> Holding breath at time of ejaculation
 - >> Jumping backward 7 times after coitus

IUD HISTORY

- 1909 Richter used silkworm gut
- 1909 Graefenberg used silkworm gut and silver wire
- 1960 Lippes Loop, Margulies Spiral, Saf-T-Coil
- 1960's Zipper used copper devices
- Tail-less steel ring used in China by 45 million
- About 10% of contraceptors in USA

IUD

- Early 20th century (Graefenberg)
- Initially metal ring but now plastic in various shapes (spirals, rings, loops, T's, Shields)
- Can be retained indefinitely
- No motivation required
- 1985 AH Robins went into bankruptcy (Dalkon Shield) and Searle withdrew (Cu-7)

IUDs Around the World

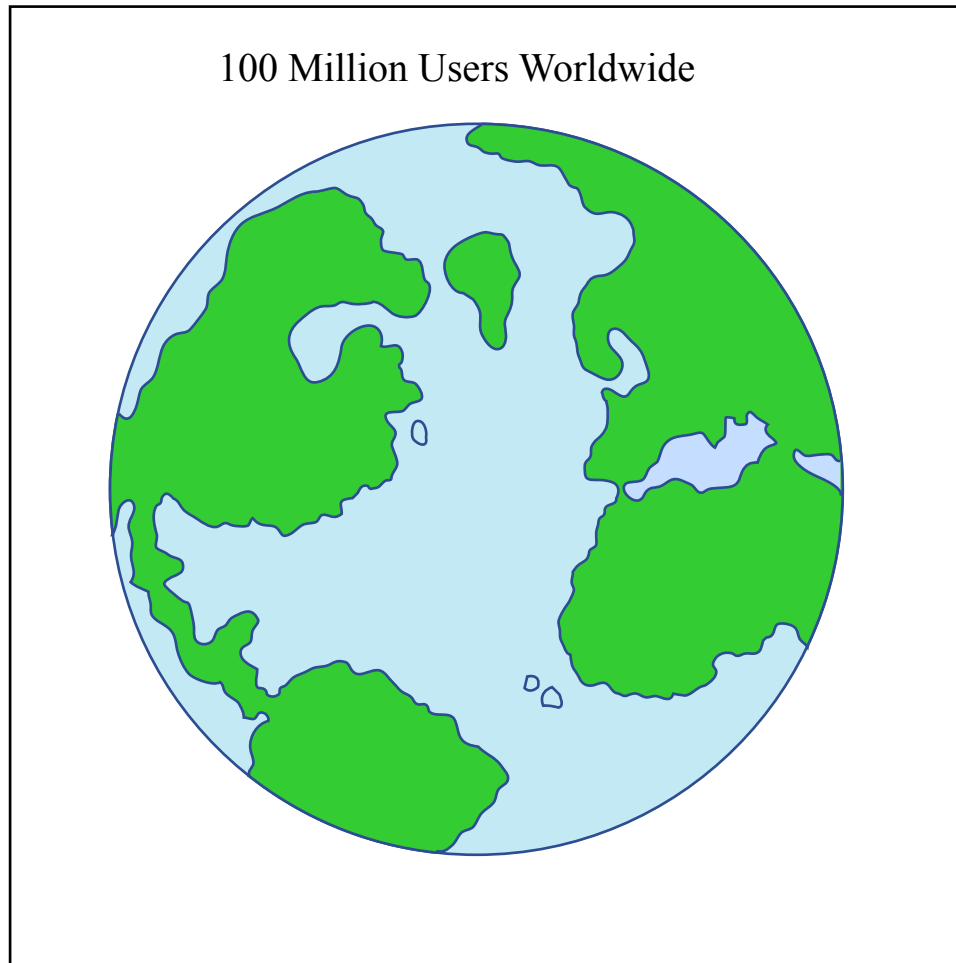


Figure by MIT OCW.

Types of Medicated IUDs

Copper-releasing:

- Copper T 380A
- Paragard
- Nova T
- Multiload 375

Progestin-releasing:

- Progestasert
- LevoNova (LNG-20)
- Mirena

Type of IUDS

Descendents of Graefenberg

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MODERN INTRA-UTERINE DEVICES

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Copper IUD (ParaGard)

Image removed due to copyright reasons.

Progestasert

Images removed due to copyright reasons.

Copper IUDs: Mechanisms of Action

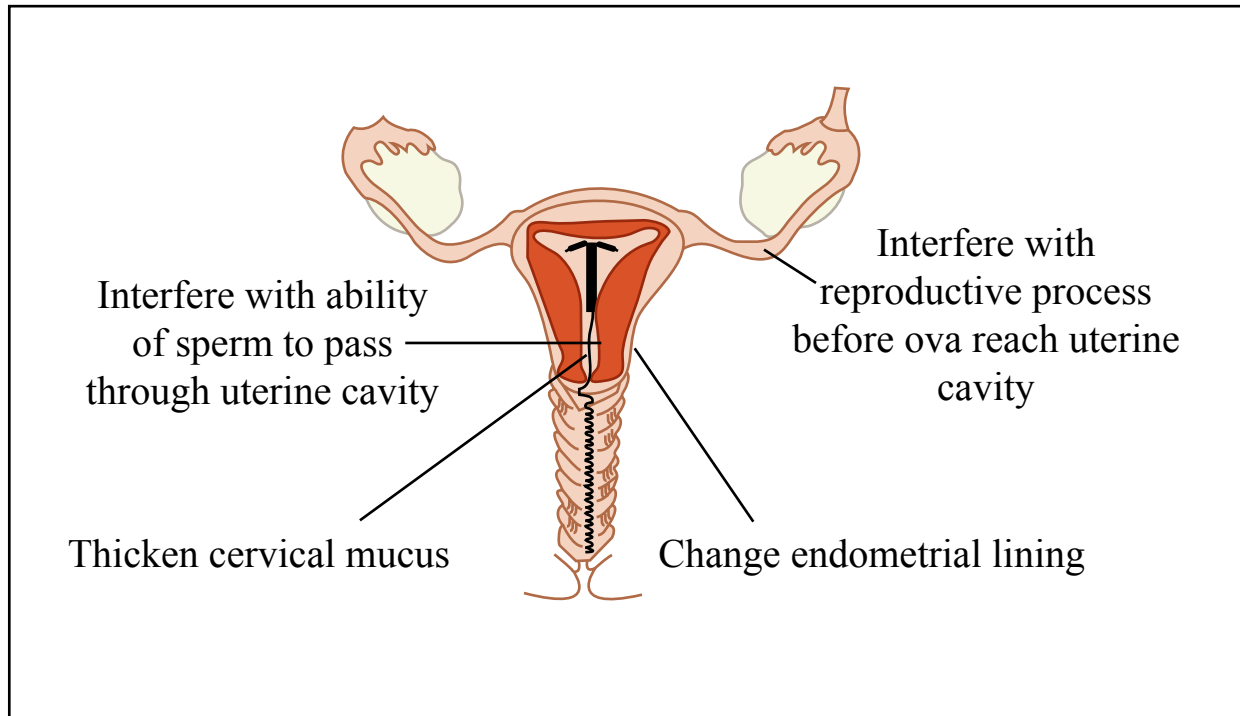


Figure by MIT OCW.

MECHANISM OF ACTION

- Hinder ascent of sperm to the fallopian tubes
- Several studies have shown that IUDs influence the number of sperm reaching the uterine cavity and the fallopian tubes
- Sterile foreign-body reaction in the uterine cavity
 - Cellular and biochemical changes that may be toxic to sperm
 - Evidence that the copper released from the IUDs may have a toxic effect on the sperm.
- Flushing studies of the uterine cavity and fallopian tubes after exposure to semen
- With IUDs - lower concentrations of sperm in the uterus and tubes
- Sperm found in women using copper IUDs were likely to be damaged
- Fewer sperm reach the site of fertilization
- Sperm may not be able to fertilize the egg (Copper devices)

MECHANISM OF ACTION

- Efficacy of IUDs is exceptionally good -- 99 percent
- Studies of early pregnancy rates have relied on sensitive measurements of serum beta-hCG
- IUDs rarely show evidence of fertilization,
- Some of these cases may result in an early embryonic loss
 - A natural occurrence !
- Using a very sensitive Hcg assay
 - Transient rise and fall of beta-hCG in only 1 percent of IUD users
- Among couples trying to conceive
 - Early embryonic loss ranges from 8 percent to 57 percent
- Natural early embryonic loss among IUD users is similar to that in other women ????????

MECHANISM OF ACTION

- Rate of recovery of fertilized eggs from the fallopian tubes of copper IUD users is much lower than that in sexually active women who are not using a contraceptive method
- In studies searching for eggs, no fertilized eggs have been found in the uterine cavity in copper IUD users
- Inert and copper-bearing IUDs confer powerful protection against tubal pregnancies
 - Suggests that these IUDs prevent fertilization from occurring
 - Contraceptive effect that extends beyond the uterus to include the fallopian tubes as well.

MECHANISM OF ACTION

- Incorrectly belief that the principal mechanism of action of IUDs is prevention of implantation of fertilized eggs (abortion)
- Evidence does not support the destruction of embryos in the uterus
- Foreign body reaction induced by copper and inert IUDs is hostile to
 - Sperm
 - Eggs in the upper genital tract
- Few sperm reach the site of fertilization in the fallopian tubes
- Those that do are unlikely to be capable of fertilizing an egg
- IUD appears to work at a much earlier stage of human reproduction than was previously thought
- Prevention of fertilization seems to be the dominant mode of action.
- World Health Organization Scientific Group: "It is unlikely that the contraceptive efficacy of IUDs results, mainly or exclusively, from their capacity to interfere with implantation; it is more probable that they exert their antifertility effects beyond the uterus and interfere with steps in the reproductive process that take place before the ova reach the uterine cavity."
- American College of Obstetricians and Gynecologists: concluded that, "As such, the IUD is not an abortifacient."

MECHANISM OF ACTION

- Endometrial samples used to study the ultrastructural changes of the human endometrium
- Absence of cytoplasmic macro-apocrine secretory granules with copper devices
- Defective separation with nonmedicated IUDs
- IUD interferes with the carbohydrate metabolism and secretory function of the endometrial cells
- Interference with the blastocyst-endometrial interaction and blastocyst survival
- May also affect sperm capacitation and/or the acrosomal reaction
 - Subsequent failure of fertilization
- Absence of ciliated cells at the site of copper IUD contact zone
- Intermenstrual bleeding with IUDs is governed by 2 factors
 - Pressure exerted by the IUD causing endothelial vascular injury and release of erythrocytes into endometrial stroma
 - Increased stromal hydrostatic pressure which acts as a force against the basal lamina and epithelial integrity
 - Loss of normal microvillous pattern of the endometrial cells even away from the copper IUD

CONDITION OF RECOVERED OVA

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PERCENT OF RECOVERED OVA

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IUDs: Contraceptive Benefits

- Few side effects
- After follow-up visit, client needs to return to clinic only if problems
- No supplies needed by client
- Can be provided by trained nonphysician
- Inexpensive (Copper T 380A)

IUDs: Noncontraceptive Benefits

- Decrease menstrual cramps (progestin-releasing only)
- Decrease menstrual bleeding (progestin-releasing only)
- Decrease ectopic pregnancy (except Progestasert)

IUDs: Limitations

- Pelvic examination required and screening for sexually transmitted diseases (STDs) recommended before insertion
- Require trained provider for insertion and removal
- Need to check for strings after menstrual period if cramping, spotting or pain
- Woman cannot stop use whenever she wants (provider-dependent)

IUDs: Limitations *continued*

- Increase menstrual bleeding and cramping during the first few months (copper-releasing only)
- May be spontaneously expelled
- Rarely (< 1/1000 cases), perforation of the uterus may occur during insertion
- Do not prevent all ectopic pregnancies (especially Progestasert)
- May increase risk of PID and subsequent infertility in women at risk for STDs (e.g., HBV, HIV/AIDS)

Who Can Use IUDs

Women of any reproductive age or parity who:

- Want highly-effective, long-term contraception
- Are breastfeeding
- Are postpartum and not breastfeeding
- Are postabortion
- Are at low risk for STDs
- Cannot remember to take a pill every day
- Prefer not to use hormonal methods or should not use them
- Are in need of emergency contraception

IUDs: Who Should Not Use

IUDs should not be used if woman:

- Is pregnant (known or suspected)
- Has unexplained vaginal bleeding until the cause is determined and any serious problems are treated
- Has current, recent PID
- Has acute purulent (pus-like) discharge
- Has distorted uterine cavity
- Has malignant trophoblast disease
- Has known pelvic TB
- Has genital tract cancer
- Has an active genital tract infection (e.g., vaginitis, cervicitis)

IUD ADVERSE EFFECTS

- Perforations (at insertion)
- Infection (1.5 times risk of PID)
 - 4.5 times as likely to be hospitalized vs OC users
- Unilateral TOA
- Tail as conduit for bacteria
 - monofilament vs polyfilament (capillary action)
- Actinomyces
- Ectopic pregnancy

IUDs: Conditions Requiring Precautions

IUDs are not recommended unless other methods are not available or acceptable if a woman has:

- Benign trophoblast disease
- More than one sexual partner
- A partner who has more than one sexual partner

IUDs: Who May Require Additional Counseling

Women who experience the following problems:

- Cervical stenosis
- Anemia (hemoglobin < 9 g/dl or hematocrit < 27)
- Painful menstrual periods
- Simple vaginal infection (candidiasis or bacterial vaginosis) without cervicitis
- Symptomatic valvular heart disease

When to Insert an IUD

- Anytime during the menstrual cycle when you can be reasonably sure the client is not pregnant
- Days 1 to 7 of the menstrual cycle
- Postpartum (immediately following delivery, during the first 48 hours postpartum or after 4 to 6 weeks; after 6 months if using LAM)
- Postabortion (immediately or within the first 7 days) provided no evidence of pelvic infection

IUDs: Common Side Effects

Copper-releasing:

- Heavier menstrual bleeding
- Irregular or heavy vaginal bleeding
- Intermenstrual cramps
- Increased menstrual cramping or pain
- Vaginal discharge

Progestin-releasing:

- Amenorrhea or very light menstrual bleeding/spotting

IUDs: Possible Other Problems

- Missing strings
- Slight increased risk of pelvic infection (up to 20 days after insertion)
- Perforation of the uterus (rare)
- Spontaneous expulsion
- Ectopic pregnancy
- Spontaneous abortion
- Partner complains about feeling strings

Immediate Postplacental IUD: Spontaneous Expulsion Rates

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Spermicides

Definition:

- Chemicals (usually nonoxynol-9) that inactivate or kill sperm

Types:

- Aerosols (foams)
- Vaginal tablets, suppositories or dissolvable film
- Creams

Foams, Creams and Suppositories

- First introduced in 1930
- Peaked in 1950's
- Dropped when IUD introduced
- Now resurging
- Potential health risks in other methods
- Few if any systemic reactions

Foams, Creams and Suppositories

- Foams
- Creams
- Jellies
- Suppositories
- Effervescent suppositories and tablets

Foams, Creams and Suppositories

- Agent that interferes with action of sperm
- Inert carrier material
- Block cervical os
- Chemical
- Both

Spermicides: Mechanism of Action

Causes the sperm cell membrane to break, which decreases sperm movement (motility and mobility) and their ability to fertilize the egg.

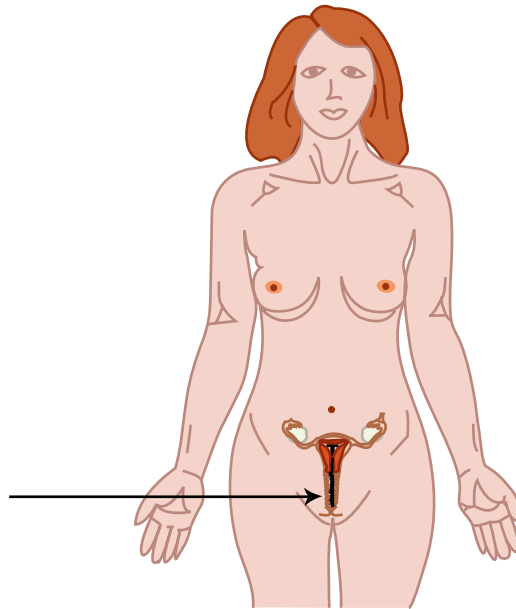


Figure by MIT OCW.

Foams, Creams and Suppositories

- Electrolytes
- Sulphydryl-binding agents
- Bactericides
- Surfactants
- Enzyme inhibitors

Foams, Creams and Suppositories

Electrolytes

- Decreased sperm activity associated with hypertonicity
- High salt jellies
- Boric acid
- Tartaric acid

Foams, Creams and Suppositories (sulphydryl binding agents)

- Disrupt cellular function
 - Oxidation
 - Alkylation
 - Formation of mercaptides
 - Phenylmercuric acid (Koromex gel)
- Hydrogen peroxide
- O-iodobenzoate
- Hydroquinones
 - Destroy protein structure by converting thiol group of cysteine to disulfide linkages
- Possible carcinogens

Foams, Creams and Suppositories (surfactants)

- Long chain alkyl groups that penetrate the lipoprotein membrane
- Surfactant increases the cell permeability
 - Leakage of contents
 - Loss of mobility
 - Affects all cells in vagina
 - Bacteria
 - Trichomonads
 - Mucosal cells

Foams, Creams and Suppositories enzyme inhibitors

- Hyaluronidase
 - Cumulus oophorus
- Corona penetrating enzyme (CPE)
 - Penetrate between corona cells
- Acrosin
 - Zona pellucida
- Results with these are promising in animals

Foams, Creams and Suppositories *toxicity*

- Menfegol
- Nonoxynyl-9
- Octoxynyl-9
- Dodecaethyleneglycol monolaurate
- Laureth 10S
- Methoxypolyoxyethyleneglycol 550 laurate
- Phenylmercuric acetate = UNSAFE

Nonoxynol-9

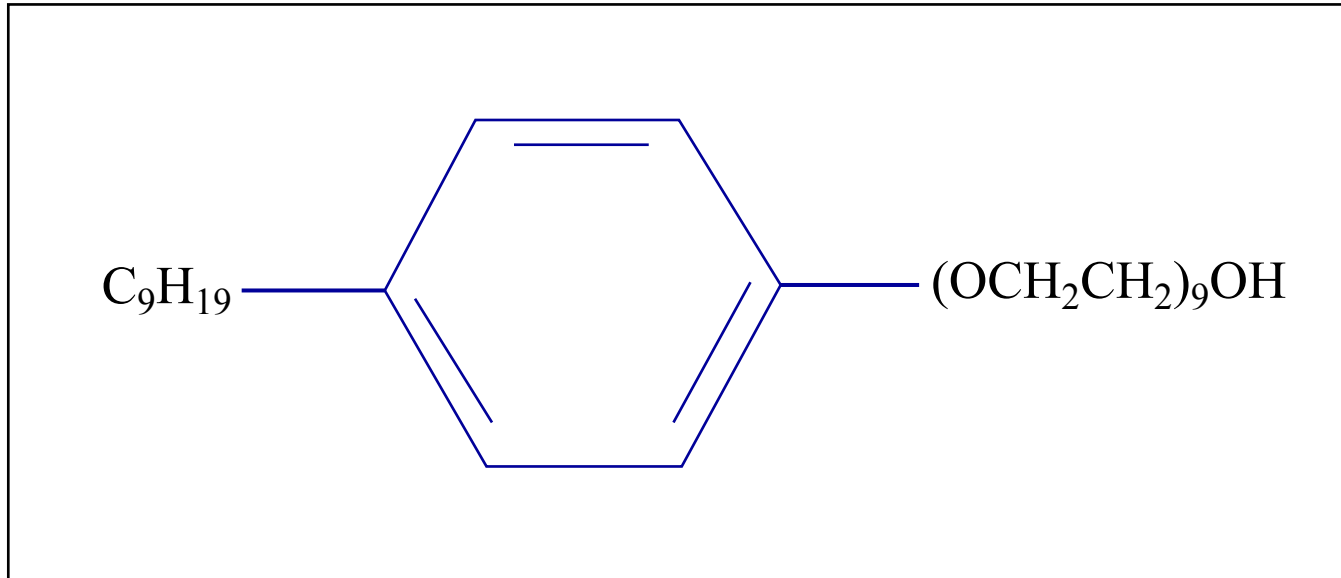


Figure by MIT OCW.

Spermicides: Selection

- Aerosols (foams) effective immediately after insertion.
- Aerosols are recommended if spermicide is to be used as the only contraceptive method.
- Foaming vaginal tablets and suppositories are convenient to carry and store but require waiting 10-15 minutes after insertion before intercourse.
- Melting vaginal suppositories also require waiting 10-15 minutes after insertion before intercourse.
- Spermicidal jellies usually used only with diaphragms.

Spermicides: Contraceptive Benefits

- Effective immediately (foams and creams)
- Do not affect breastfeeding
- Can be used as backup to other methods
- No method-related health risks
- No systemic side effects
- Easy-to-use
- Increases wetness (lubrication) during intercourse
- No prescription or medical assessment necessary

NONOXYNOL-9

STD Protection

- Most women in the USA with (HIV) become infected through sexual transmission
- Choice of contraception can affect risk for HIV
- Most contraceptives do not protect against transmission of HIV and other STDs
- Some contraceptives containing nonoxynol-9 (N-9) might **increase** the risk for HIV sexual transmission.
- Three randomized controlled trials of N-9
 - Commercial sex workers (CSWs) in Africa failed to demonstrate any protection against HIV infection
 - One trial showed an increased risk
 - N-9 contraceptives also failed to protect against infection with *Neisseria gonorrhoeae* and *Chlamydia trachomatis* in two randomized trials

NONOXYNOL-9

STD Protection

- Because most women in the African studies had frequent sexual activity, had high-level exposure to N-9, and probably were exposed to a population of men with a high prevalence of HIV/STDs, the implications of these studies for U.S. women are uncertain.

NONOXYNOL-9

STD Protection

- in 1999, before the release of recent publications on N-9 and HIV/STDs Title X family planning clinics in the U.S. purchased and distributed N-9 contraceptives.
- Among at least eight family planning clinics, most of the condoms purchased were N-9—lubricated
- The 2002 STD treatment guidelines state that condoms lubricated with spermicides are no more effective than other lubricated condoms in protecting against the transmission of HIV infection and other STDs
- CDC recommends that previously purchased condoms lubricated with N-9 spermicide continue to be distributed provided the condoms have not passed their expiration date. The amount of N-9 on a spermicide-lubricated condom is small relative to the doses tested in the studies in Africa and the use of N-9--lubricated condoms is preferable to using no condom at all.

Nonoxynol-9 & STD's

(JAMA.2002;287:1117-1122)

- Objective: To compare nonoxynol-9 gel and condom use (gel group) vs condom use alone (condom group) for the prevention of male-to-female transmission of urogenital gonococcal and chlamydial infection.
- Design and Setting: Randomized controlled trial conducted at 10 community clinics and 10 pharmacies in Yaoundé, Cameroon, between October 1998 and September 2000, with 6 months of follow-up.
- Participants: High-risk population of 1251 women (excluding sex workers) being treated for or who had symptoms of sexually transmitted infections. Three were excluded from the gel group (0.5%) and 7 from the condom group (1%) because of no follow-up data.

Nonoxynol-9 & STD's

(JAMA.2002;287:1117-1122)

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History of Condom

- **Used for centuries**
 - Pregnancy protection
 - Infection protection
 - Stimulation
 - Decoration
- **1350 BC Egyptians wore decorative covers for penis**
- **100-200 AD Europe – cave paintings in France and Rome**
- **1564 Fallopius described linen sheaths (protection syphilis)**
- **Late 1500 chemical soaked linen**
- **Given name “Condom”: Protection from venereal disease and numerous bastard offspring**
- **Possibly a doctor caring for Charles II (many children)**
 - English Cape
 - French letters
- **Used in a poem in 1706 (condum)**
- **1798 Casanova (from his memoirs)**

HISTORY OF CONDOM

- **1700 Condoms made out of animal intestines began to be available**
 - Quite expensive
 - Often reused
 - “an armour against pleasure, and a cobweb against infection”.
- **In the second half of the 1700's,**
 - Trade in handmade condoms thrived in London 1800's
- **The use of condoms was affected by technological, economic and social development in Europe and the US in 1800s.**
- **1800's Condom manufacturing was revolutionised by the discovery of rubber vulcanisation by Goodyear (founder of the tyre company) and Hancock**
- **Possible to mass produce rubber goods including condoms quickly and cheaply.**
- **1861, the first advertisement for condoms was published in an American newspaper**
 - The New York Times printed an ad. for 'Dr. Power's French Preventatives.'
- **1873mComstock Law was passed.**
 - Anthony Comstock, the Comstock Law made illegal the advertising of any sort of birth control
 - Allowed the postal service to confiscate condoms sold through the mail.
- **Until the 1920's, most condoms were manufactured by hand-dipping from rubber cement**
 - Aged quickly and the quality was doubtful
- **1919, Frederick Killian initiated hand-dipping from natural rubber latex in Ohio**
 - Advantage of ageing less quickly and being thinner and odourless
 - Enjoyed a great expansion of sales
 - Mid-1930s, the fifteen largest makers in the U.S. were producing 1.5 million condoms a day

HISTORY OF CONDOM

- 1957 Very first lubricated condom was launched in the UK by Durex
- 1960s, Use of condoms as a contraceptive device declined
- 1980s Use of the condom increased strikingly in many countries following the recognition of HIV/AIDS
- 1980's. Condoms also became available in pubs, bars, grocery stores and supermarkets
- Female condom has been available in Europe since 1992
- Approved in 1993 by the US Food and Drug Administration (FDA)
- 1994, the world's first polyurethane condom for men was launched in the US.
- 1990s also saw the introduction of colored and flavored condoms

Condom History

Most experts believe there was a Dr. Condom--or perhaps a Dr. Conton, who was fond of a method of birth control that is evident in the name.

The experts do not agree, however, on who he was. One theory is that he was in some way associated with the court of King Charles II. He may have been court physician to the king, and thus supplied His Majesty with the royal birth control devices.

One version says that the king was so delighted with the invention that he made Condom a knight. Another source traces the word to a mid-17th century Colonel Condom of Britain's Royal Guards.

Some word watchers doubt there was a Dr. Condom at all. They claim condom is simply derived from the Latin "condus," which means receptacle. In any case, condom use predates the court of King Charles II. The first known published description and clinical trials of condoms were recorded by Gabrielle Fallopius. His sheath was made of linen.

There is a town in France called Condom, by the way. It's the center for the production of Armagnac, a type of brandy. Town officials say that they have to replace the sign bearing the name of their town five or six times a year. They are frequently stolen by British tourists. The French word for "condom" is "preservatif."

Male Condoms: Definition

- Thin sheaths of rubber, vinyl or natural products which may be treated with a spermicide for added protection. They are placed on the penis once it is erect.
- Condoms differ in such qualities as shape, color, lubrication, thickness, texture and addition of spermicide (usually nonoxynol-9).

Types of Male Condoms

- Latex (rubber)
- Plastic (vinyl)
- Natural (animal products)

Latex

- Most popular type of condom
- Biggest selection
- Made from natural rubber latex
 - A processed plant product derived almost exclusively from the trees found in Africa and Southeast Asia
 - Extremely elastic
 - Can stretch to fit any size
- During manufacturing and product testing condoms are stretched and inflated to several times their natural size and shape
- Put under much more stress during testing than they would usually receive during sexual intercourse
- Molecular make up of the latex condom is such that it does not allow the bacteria and viruses which carry STDs and AIDs to pass through
- Effective means of disease prevention
- Latex condoms could and should only be used with water based lubricants

Polyurethane

- Only recently been used to make condoms
- Stronger, thinner and with no odor or taste
- Only a few manufacturers have developed and marketed them
- Recommended for persons who are allergic to latex
- Currently 3 brands available the SUPRA, AVANTI and the FEMALE CONDOM.

Lamb Skins

- Made from the intestine of animals
- First forms of birth control
- Very natural feeling
- Effective form of birth control
- Various bacteria and viruses which carry STDs and AIDs can pass through the porous walls of the natural membrane
 - Causing them to be ineffective in the prevention of sexually transmitted disease
- There is only one remaining brand - [Trojan Natural Lamb](#)
Natural Lamb Skins should only be used for the prevention of pregnancy

Male Condoms: Mechanisms of Action

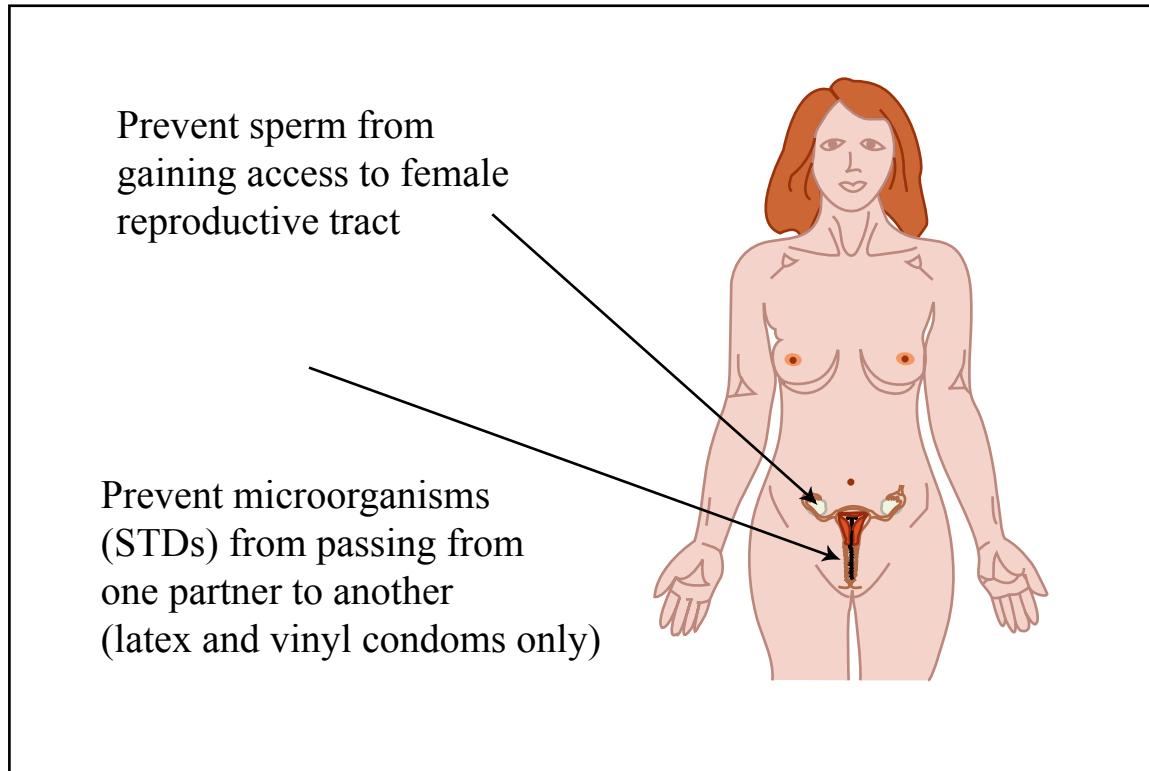


Figure by MIT OCW.

Male Condoms: Contraceptive Benefits

- Effective immediately
- Do not affect breastfeeding
- Can be used as backup to other methods
- No method-related health risks
- No systemic side effects
- Widely available (pharmacies and community shops)
- No prescription or medical assessment necessary
- Inexpensive (short-term)

Male Condoms: Noncontraceptive Benefits

- Promote male involvement in family planning
- Only family planning method that provides protection against STDs (latex rubber and vinyl condoms only)
- May prolong erection and time to ejaculation
- May help prevent cervical cancer

Male Condoms: Limitations

- Moderately effective (3-14 pregnancies per 100 women during the first year¹)
- Effectiveness as contraceptives depends on willingness to follow instructions
- User-dependent (require continued motivation and use with each act of intercourse)
- May reduce sensitivity of penis, making maintenance of erection more difficult

¹Trussell et al 1998.

Male Condoms: Limitations

continued

- Disposal of used condoms may be a problem
- Adequate storage must be available at client's home
- Supplies must be readily available before intercourse begins
- Resupply must be available

Condom Bursting Strength

Image removed due to copyright reasons.

Condom

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Latex vs. Polyurethane Condoms: Breakage and Slippage Rates

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Source: Frezieres et al 1998.

This study of 360 couples in Los Angeles, California compared the breakage and slippage rates of two types of condoms: latex and polyurethane. The slide shows clinical failure rates, all breakages and slippages that occurred during intercourse or withdrawal. Overall, polyurethane condoms were found to be 6.6 times more likely to suffer clinical breakage or slippage than were latex condoms. The study also looked at the characteristics of study participants that were correlated with condom breakage; they were: history of condom breakage with the current partner, with partner for less than 6 months among others. Also of interest is that almost half of the couples preferred the polyurethane condoms.

Latex Condom Breakage and Slippage Rates

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Source: Rosenberg and Waugh 1997.

This study of 92 couples and 4637 episodes of use, reported a clinical breakage rate of 0.28%, total breakage rate of 0.41% and slippage rate of 0.61%. It is important to note that 21 of 29 slippages occurred in one couple; if that couple is removed from the results the total failure rate is halved. These rates are lower than most reported failure rates

Male Condom Contraceptive Failure Rates

Image removed due to copyright reasons.

Source: Glass, Vessey and Wiggins 1974; Hatcher et al 1994.

Condom failure rates vary greatly from study to study. A 1974 study by the British Family Planning Association which followed 2057 couples who had switched to the condom from COCs, IUDs or the diaphragm found a failure rate of 4%. A rate of 12% is more commonly given as the failure rate for typical users. It is important to note that for condom users, typical users include those using condoms inconsistently and incorrectly.

Size Comparison

Spermatozoa 3000 nm

Bacteria:

N. gonorrhoea 1000 nm

C. trachomatis 300 nm

U. urealyticum 200 nm

Viruses:

CMV 150-300 nm

HSV 100-150 nm

HIV 120 nm

HPV 45-55 nm

HBV 42 nm

HB_SAg 22 nm

Frequency of HIV Seroconversion with Condom Use Among Prostitutes

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Source: Ngugi et al 1988.

Female Condom

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Vaginal Sponges

- Real sponges used for centuries
- June 1983 “TODAY” (Two Day)
- 2 inches long by 1.25 inches thick
- Polyurethane - 1 gram nonoxynol-9
- 125-150 ug per 24 hours (10-15%)
- Rare toxic shock
- Bacteriocidal/virocidal/spermicidal
- Not carcinogenic
- Remove 6 hours after the last coitus

Diaphragm

Images removed due to copyright reasons.

Cervical Cap

- 1938 by German gynecologist
- Ivory, metal, rubber, plastic
- Vimule (trauma), Dumas (short cervix)
- Prentiff (cavity rim)
- 22,25,28.5 mm diameter
- Keep on 6 hours after intercourse
- Foul smell by 3 days
- Dislodgement
- No toxic shock

Cervical Cap

The Cervical Cap is thousands of years old. In ancient times, women molded opium into cup-like devices to place over their cervix. Beeswax and oiled paper were also used and shaped into "thimbles" to go over the cervix.

It was Casanova, however, who proposed what was perhaps the most creative "organic" cap. He would take a lime or lemon and cut it in half. The acid of the juice was the spermicidal agent and the skin of the fruit acted as a cap to cover the cervix.

Cervical Cap

The modern cap (**The Prentif Cavity-Rim Cervical Cap**) has been made for seventy years from latex rubber. The manufacturer, Lamberts (Dalston) Ltd. of England, has made these caps for all those years, as well as two other styles not approved for use in the USA.

During the first World War, when materials were in short supply, a shipment of rubber destined for bathroom floors in an exclusive hotel in France was commandeered. With this, the first "designer caps" were made, in colorful marbled patterns in all shades.*

The most exotic of all caps must be those made in Germany at the turn of the century, they were made of gold!

Cervical Cap

Images removed due to copyright reasons.

Lea® Contraceptive

Image removed due to copyright reasons.

- **One size fits all women**
- **Highly rated by Planned Parenthood**
- **Can be inserted up to 8 hrs. before intercourse**
- **Can be left in up to 48 hrs. after intercourse**
- **Reusable-up to six months unlimited use**
- **Non-toxic, free from hormones**

According to the manufacturer, studies have shown it to be excellent if used correctly and with spermicidal jelly (98% effective). Planned Parenthood rates its effectiveness the same as that of a diaphragm or cap with spermicidal jelly (Contraceptive Options, March 1997).

Cervical Cap

Advantages

- 1.Can be left in place for up to 48 hours, allowing spontaneous protected coitus.
- 2.Requires only one small application of spermicide inside the cap at time of insertion. Less messy than the diaphragm, more aesthetic for the user.
- 3.Smaller than a diaphragm and less noticeable to either partner.
- 4.Good alternative for women who cannot use the diaphragm because of poor vaginal muscle tone.
- 5.Use of cervical caps may assist in avoiding urinary tract infections associated with diaphragm use.
- 6.Sturdier than a diaphragm.
- 7.Less spermicide is used than the diaphragm, allowing more pleasant oral sex.
- 8.Fewer and less serious side effects than the pill or IUD.
- 9.It is likely that cervical cap use offers similar noncontraceptive benefits as does diaphragm use; that is, protection against some sexually transmitted diseases.
- 10.No reports of cases of toxic shock syndrome have been associated with cervical cap use.

Cervical Cap

Disadvantages

1. Sometimes more difficult to insert or remove than a diaphragm.
2. Can be dislodged from the cervix during sex.
3. Four percent of women using the cervical cap in clinical trials had an abnormal Pap smear after 3 months of use, as compared to 1.7% among diaphragm users. After 6 months cervical cap usage, the rates of Pap smear change were about the same for both the cap and diaphragm.

- **An unusually long or short cervix.**
- **A history of cervical lacerations or scarring.**
- **Current cervicitis.**
- **An unusually shaped or asymmetrical cervix.**
- **Current vaginal infections.**
- **Unresolved Abnormal Pap smears**

CERVICAL CAP

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CAP vs DIAPHRAGM

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