



Male Contraception

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UNDP/UNFPA/WHO/World Bank
Special Programme of Research
Development and Research Training
in Human Reproduction

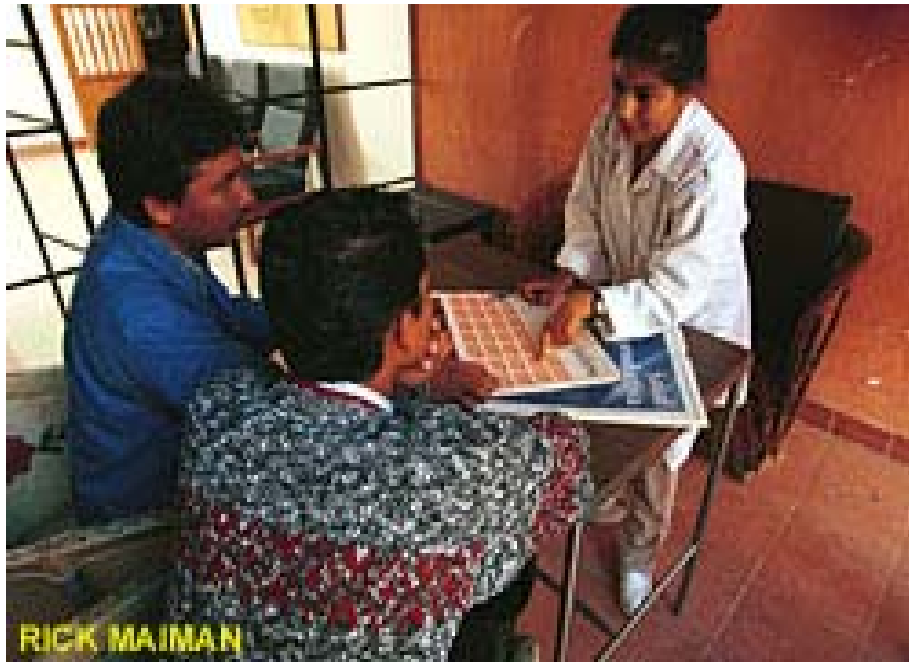


WHO's Male Reproductive Health Research

- **Contraceptive research and development**
- **Targeted basic science**
- **Social science**
- **Men's role in reproductive health**
- **Norms and Standards in Andrology**
- **Training workshops**



Why Men in Family Planning?



- **International Conference on Population and Development, 1994**
- **Disproportionate reproductive disease burden**
- **Shared responsibility and gender equity**



Distribution of Contraceptive Use Prevalence

World wide contraceptive use

Contraceptive	No. of users (Millions)	Users (%)	First year failure rate (%) - Typical use
Total users	550	53	
<u>Modern methods</u>			
Female sterilization	163	30	0.5
IUD	110	20	0.8
Oral contraceptives	91	17	5.0
Condom	49	9	14.0
Male sterilization	45	8	0.15
Injectables/implants	11	2	0.3
Vaginal barriers	8	1	20.0
<u>Traditional methods</u>			
Withdrawal	41	7	19.0
Rhythm	32	6	25.0

UNFPA, 1994



Male Contraception

Research and Development

- Use of existing male methods is low, with regional and country differences
- Men are *aware* of family planning methods
- Men *approve* of the use of family planning
- Low levels of use may be related to the *negative characteristics of existing methods*
- Example: In a study conducted in Fiji, Iran, India and Korea, men considered a male pill or injection to be more acceptable than vasectomy



The Ideal Male Contraceptive

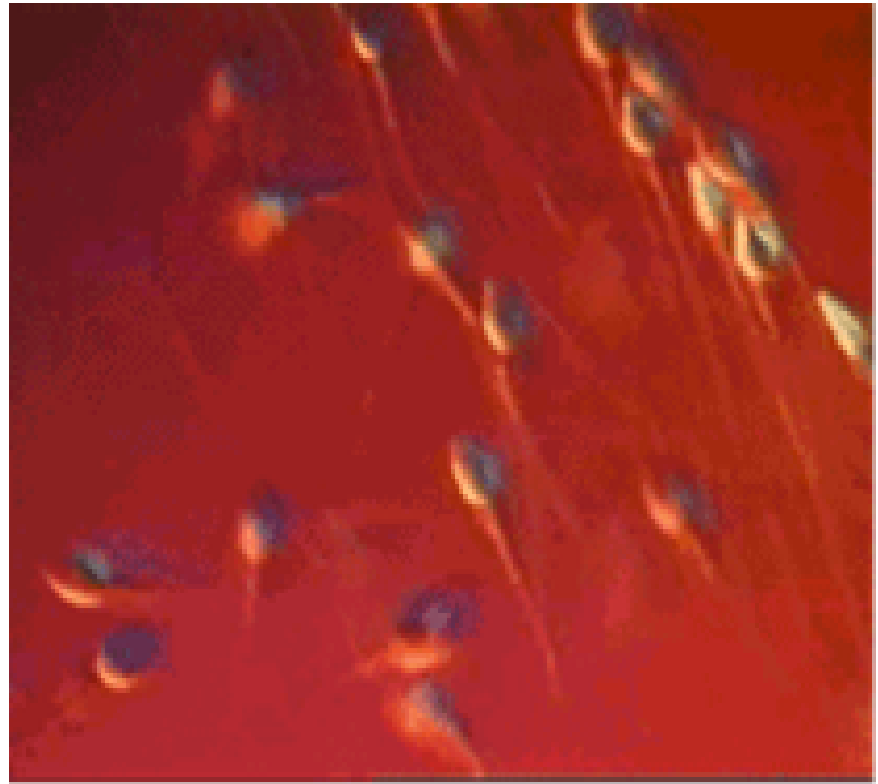
- **Safe** - *no harmful side effects*
- **Effective** - *it works!*
- **Acceptable** - *to men and their partners*
- **Affordable** - *to donors, programs, and potential users*



Approaches to Male Contraception:

Targeting the sperm

- **Inhibit production**
- **Interrupt transport**
- **Block deposition**
- **Disrupt function**
- **Prevent fertilization**





Inhibiting Sperm Production

Hormonal Contraception

Androgen alone

T Enanthate

T Undecanoate

T Buciclate

Pellets

Progestin + Androgen

Norplant

DMPA

Norethisterone Enanthate

GnRH

Agonists

Antagonists

Vaccines

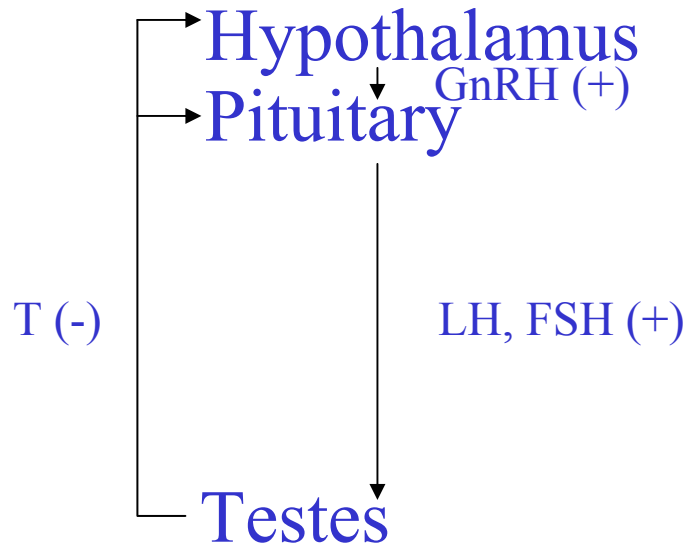
FSH

Antagonists

Vaccines



Hormonal Male Contraception





Hormonal Approaches to Male Contraception

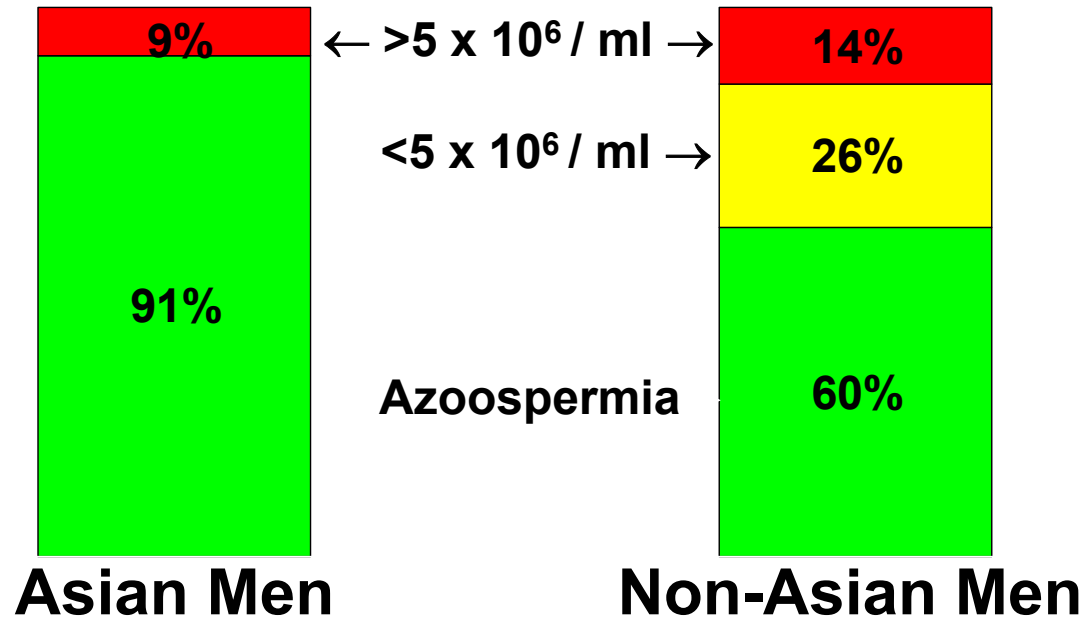
Androgen alone

- 1990: 200 mg testosterone enanthate/week will reduce sperm production in some men
- Sperm concentrations consistently below 1 million/ml result in few or zero pregnancies
- All men do not fully suppress
- Requirement for weekly injections and high T concentrations



Hormonal Approaches to Male Contraception

Androgen alone

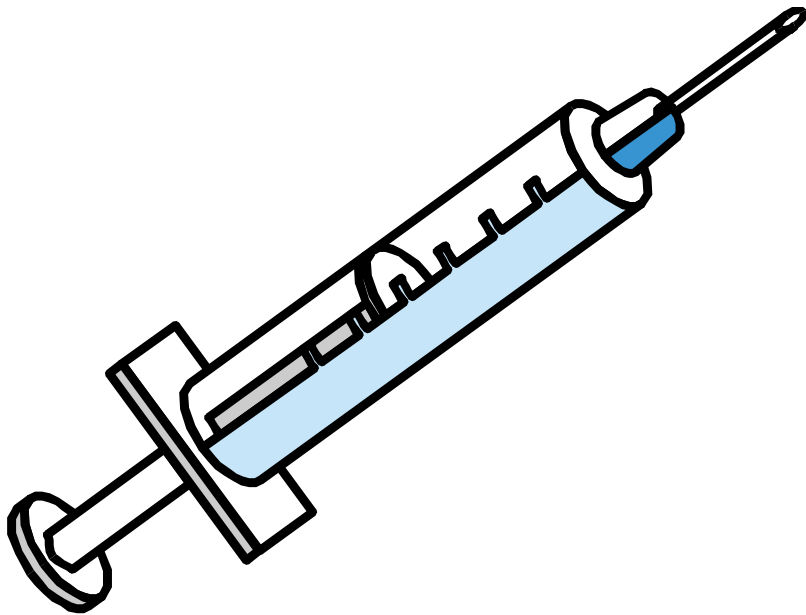


Sperm concentrations following weekly inj. 200 mg T-enanthate



Hormonal Approaches to Male Contraception

Androgen alone



Testosterone Enanthate

- Extensive clinical experience
- “Burst” effect
- Short acting
- Weekly injections
- High levels testosterone



Hormonal Approaches to Male Contraception

Androgen alone

Testosterone Undecanoate

- Oral or injectable
- Longer release profile
- 4-8 week injection intervals may be adequate
- Maintains testosterone in physiological range
- Large dose required

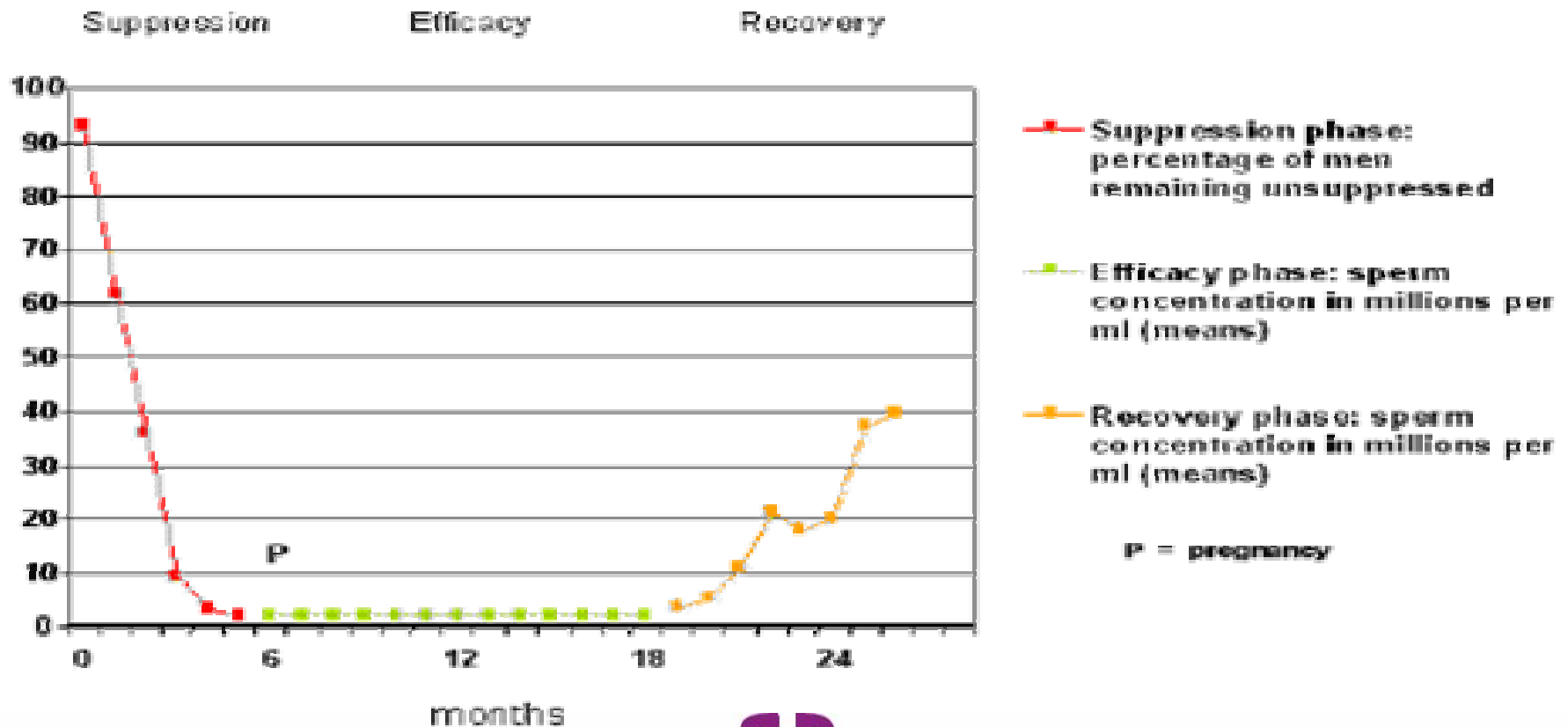
Testosterone Buciclate

- No “burst” effect
- Long-acting injectable
- Injections at 3-4 month intervals may be adequate
- High dose required



Hormonal Approaches to Male Contraception

Androgen alone





Hormonal Approaches to Male Contraception

Androgen with Progestin

- More rapid and effective sperm suppression
- Effective in diverse populations
- Reduced overall drug load
- Physiological testosterone levels
- Requires a 2 drug regimen
- Drugs may have different routes or frequencies of administration



Hormonal Approaches to Male Contraception

Androgen with Progestin

Progestagen	Androgen	% Azoo-spermic	% Oligozoo-spermic	Reference
DMPA 250 mg every 6 weeks	19 NT (200 mg every week x 6/7 weeks, then 200 mg/3 or 4 weeks).	67 (W) 98 (A)	92 (W) 99 (A)	Knuth et al (1987)
	TE (200 mg(IM every week x 6/7 weeks, then 200 mg/4 weeks)	59 (W) 96 (A)	91 (W) 96 (A)	WHO (1993)
DMPA 300 mg	T implant (800 mg)	90 (W)	100 (W)	Handelsman et al (1996)



Hormonal Approaches to Male Contraception

Androgen with Progestin

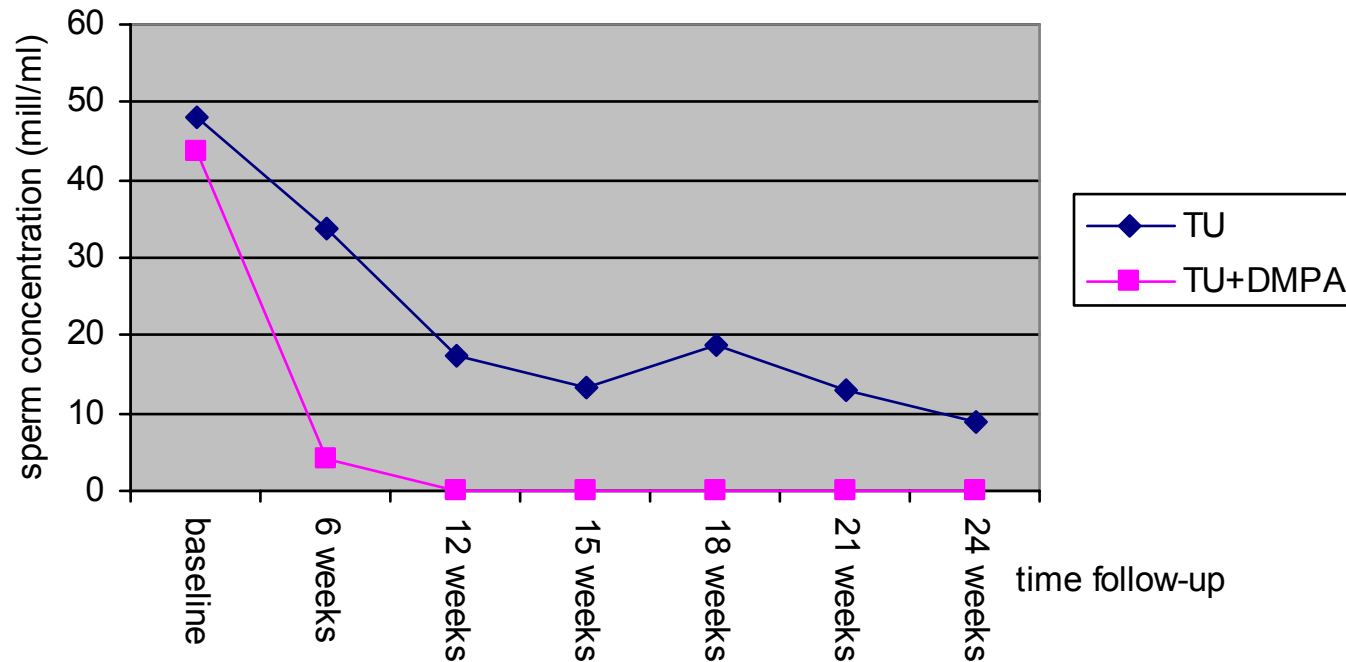
Progestagen	Androgen	% Azoo-spermic	% Oligozoospermic	Reference
Levonorgestrel (oral)				
500 µg/day	TE (100 mg/week IM)	67 (W)	94 (W)	Bebb et al (1996)
250 µg/day	TE (100 mg/week IM)	78 (W)	89 (W)	Anawalt et al (1997)
125 µg/day	TE (100 mg/week IM)	61 (W)	94 (W)	
Desogestrel (oral)				
300 µg/day	TE (100 mg/week IM)	81 (W)	94 (W)	Wu et al (1998)
150 µg/day	TE (50 mg/week IM)	73 (W)	100 (W)	

W=White, A=Asian, DMPA=depotmedroxyprogesterone acetate, TE=testosterone enanthate
19 NT= 19 nortestosterone hexyloxyphenylpropionate



Hormonal Approaches to Male Contraception

Androgen with Progestin





Hormonal Approaches to Male Contraception

Other Approaches

- Androgen with anti-androgen (*cyproterone acetate*)
 - Progestin with anti-androgen properties
 - May block the activity of any residual T in the testis
- Androgen with GnRH Analogue
 - Effective suppression of gonadotrophins
 - High cost; frequent application



Interrupting Sperm Transport

Vasectomy/Sterilization

Worldwide, 42-60 million men (5-8% of married couples) rely on vasectomy

- New Zealand - 23%
- United States - 11%
- The Netherlands - 11%
- South Korea - 11%
- Australia 10%
- China - 8%
- India - 7%
- Nepal - 5%
- Thailand - 5.3%
- Sri Lanka - 4.6%
- Brazil 1.6%

All other developing countries have <1% prevalence of use



Interrupting Sperm Transport

Vasectomy/Sterilization

Contraceptive Prevalence by Methods Used (China 1982, 1988, and 1992 National Family Planning Surveys)

Method	Year of Survey		
	1982 (n=172,788)	1988 (n=406,387)	1992 (n=73,946)
<u>Sterilization</u>	24.5%	35.0%	46.1%
Female	17.6%	27.2%	35.9%
Male	6.9%	7.8%	10.2%
<u>IUD</u>	34.9%	29.5%	33.1%
<u>Others*</u>	10.1%	6.6%	5.2%
<u>Non-users</u>	30.5%	28.9%	15.4%

* The oral pill, condom, spermicide and other methods.



Interrupting Sperm Transport

Vasectomy/Sterilization

- **Conventional vasectomy**
 - highly effective and safe
 - incision required
 - permanent
- **Percutaneous vas occlusion**
 - many compounds evaluated
 - lower efficacy rates
 - some additional complications
- **No-scalpel vasectomy**
 - highly effective
 - Somewhat more acceptable
 - lower complication rates



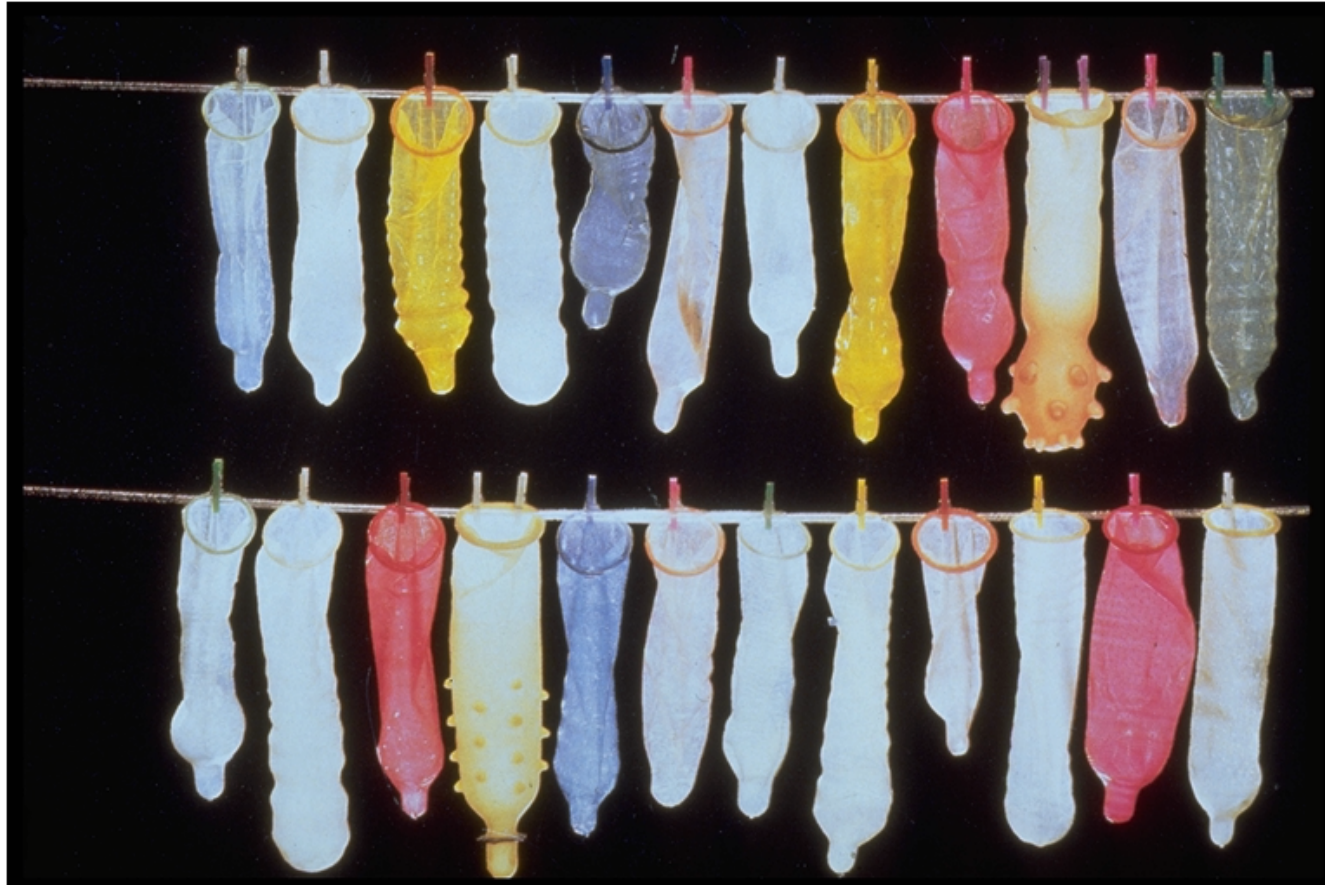
Methods of Vasectomy

Success of Reversal

Method	Follow-up (no and %)	Sperm (no and %)	Normal (no and %)	Pregnancy (no and %)
No-scalpel Vasectomy	19/23 (82.6)	16/19 (84.2)	13/19 (68.4)	15/19 (78.9)
Chemical Vas occlusion	26/31 (83.9)	18/26 (69.2)	12/26 (46.2)	13/26 (50.0)
MPU Vas occlusion	31/34 (91.2)	10/31 (32.3)	10/31 (32.3)	9/31 (29.0)



Blocking sperm deposition





Blocking sperm deposition

Male Condoms

- Condoms are effective at preventing pregnancy and STI/HIV
- Condom use is low even in countries with high prevalence of HIV/AIDS
- How can we increase condom use?





Blocking sperm deposition

Male Condoms

Condom studies

- Randomized comparative studies of “standard” and “new” condoms
 - Acceptability and preference
 - Contraceptive efficacy
 - Prevention of STI
- Reasons for use and non-use of condoms



Disrupting Sperm Function and Preventing Fertilization

- Targeted basic science research on testicular, epididymal or vas approaches:
- Some promising targets:
 - functional development, i.e. motility
 - structural development, i.e. organelles
 - structure and function, i.e. membrane integrity and intracellular pathways



Acceptability/Sociobehavioral Studies

- Current use of male methods
- Preferences for new methods
- Characteristics of new methods
- Continuation and discontinuation of trial
- Effects on mood
- Effects on behavior
- Effects on cognition
- Partner's views on mood and behavior



Acceptability/Sociobehavioral Studies

Reports from 25 Swedish men participating in TE trial

Expectations

- Freedom and security
- Problems with female methods
- Desire for more satisfying sex life
- Need for male control
- Fear of negative side effects

Satisfaction

- Greater freedom
- More ease in sex life
- Would recommend method to others
- Trouble with injections
- Fear of problems with aggressiveness
- Dermatological problems



Acceptability/Sociobehavioral Studies

	<i>Very important</i>	<i>Somewhat important</i>	<i>Not important</i>
Men should share responsibility for contraception	41.2	51.0	7.8
Contributing to solving the population problem	41.6	48.7	9.7
I felt I was doing a good thing for my country	36.7	52.9	7.9
I like to be involved in new things	25.0	56.8	18.2
I felt pride in contributing to scientific advancement	26.9	51.6	21.4
Pioneer of a new method of contraception	24.4	46.1	29.5
My wife wanted me to take responsibility	23.1	44.8	32.1
I joined for getting the financial compensation	12.7	28.6	58.8



Acceptability/Sociobehavioral Studies

	Month 4 %	Month 8 %
Reasons for perceived inconvenience	(n = 78)	(n = 117)
Have to come to clinic	23.1	9.3
Once a month too frequent	70.5	76.3
Wait at the clinic	1.3	5.1
Other	5.1	9.3
Total	100.0	100.0
Reasons for dissatisfaction	(n = 87)	(n = 117)
Side effect	11.5	6.0
Inconvenience	54.0	48.7
Injection pain	21.8	12.0
Others	12.6	33.3
Total	100.0	100.0



Men's Role in Reproductive Health

Men can:

- Inhibit access to and use of FP
 - Expose women and themselves to disease including HIV
 - Act as barriers to women's reproductive health
- OR
- Facilitate use of contraception
 - Protect themselves and their partners from infection
 - Act as partners in promoting reproductive rights and care for all