Assisted reproductive technologies

Basic issues
Infertility

- Infertility is now defined as the inability to conceive after one year of unprotected sex.
- It extends to single people, and homo-gendered couples.
- The definition of infertility has changed over the years, including who is infertile [age range and partnership] and years to conceive.
For instance

• In the 70’s infertility was defined as the inability to get pregnant after two years of heterosexual intercourse if the woman was over 30.

• Now it is 1 year under 30, 6 months over 30, and heterosexual intercourse is not a prerequisite.
Statistics

• **Infertility by Race**
  6.4% of white women are infertile
  7% of Hispanic women are infertile
  10.5% of black women are infertile

• **Infertility among** married women by level of education
  8.5% had no high school diploma or equivalent.
  8.1% had only a high school diploma or equivalent.
  6.6% had some college, but no degree.
  5.6% had a bachelor's degree or higher.

• "Fertility, Family Planning and Women's Health: New Data from the 1995 National Survey of Family Growth," The US Department of Health and Human Services.
Female infertility

- Cancer or tumor
- Clotting disorders
- Diabetes
- Growths (such as fibroids or polyps) in the uterus and cervix
- Birth defects that affect the reproductive tract
- Excessive exercising
- Eating disorders or poor nutrition
- The time after getting off hormonal contraception
Female cont.

- Use of certain medications, including chemotherapy drugs
- Drinking too much alcohol
- Obesity
- Older age
- Ovarian cysts and polycystic ovary syndrome (PCOS)
- Pelvic infection or pelvic inflammatory disease (PID)
- Scarring from sexually transmitted infection or endometriosis
- Thyroid disease
- Too little or too much hormones
Male infertility

- Environmental pollutants
- Being in high heat for prolonged periods
- Birth defects
- Heavy use of alcohol, marijuana, or cocaine
- Too little or too much hormones
- Impotence
Male cont.

- Older age
- Cancer treatments, including chemotherapy and radiation
- Scarring from sexually transmitted diseases, injury, or surgery
- Retrograde ejaculation
- Smoking
- Use of certain drugs
- Infection
Testing for men

- Sperm testing
- Testicular biopsy (rarely done)
Testing for infertility- women

- Blood tests to check hormone levels, including progesterone and follicle stimulating hormone
- Checking body temperature first thing in the morning to check if the ovaries are releasing eggs
- FSH and clomid challenge test
- Hysterosalpingography (HSG)
- Pelvic ultrasound
- Laparoscopy
- Luteinizing hormone urine test (ovulation prediction)
- Thyroid function tests
ART

• Assisted Reproductive Technologies refers to the spectrum of medical advancements in baby-making outside the realm of heterosexual intercourse

• It includes IVF where an ovum is taken from the woman's ovary, fertilized in a glass dish with the husband’s sperm, and then the newly-conceived human being is transferred to the mother’s womb

• Surrogacy, where a fertilized egg is placed in another woman’s womb

• Donor ovum for surrogacy/ IVF
The next step

• Infertility most often cannot be cured the way cancer or the flu can
• Rather a baby can be produced
• Some couples choose hormone therapy, acupuncture, surgery to correct blockage
• Other enjoy child-free life or adopt
• Other pursue reproductive technologies
What the man endures

• Semen is obtained through masturbation,
• aspiration of the testes,
• or use of a sealing condom during intercourse.
What the woman endures

• Hyper-ovulation is induced by hormonal drugs
• The eggs are retrieved from the patient using a transvaginal technique called transvaginal oocyte retrieval, involving an ultrasound-guided needle piercing the vaginal wall to reach the ovaries.
• The embryos judged to be the "best" are transferred to the patient's uterus through a thin, plastic catheter, which goes through her vagina and cervix.
What the woman endures, cont.

• If “too many” embryos implant, abortion is performed to reduce the number
• Pregnancies of multiples are more likely to result in complications for the mother, including mandatory bed rest
• Risks of cancer is increased by the use of hormonal drugs
Other Types of ART

- [PGD] Pre-implantation Genetic Diagnosis, where zygotes are determined to be healthy, or not, and the unhealthy ones are exterminated.
- And AI, artificial insemination, where a woman gets fertilized by a man’s sperm within the womb.
- Possibilities of synthetic wombs and cloning as reproduction are being considered.
IVF

- In vitro fertilisation (IVF) is a process by which egg cells are fertilized by sperm outside the body: *in vitro*. IVF is a major treatment in infertility when other methods of assisted reproductive technology have failed.

- The process involves hormonally controlling the ovulatory process, removing ova (eggs) from the woman's ovaries and letting sperm fertilise them in a fluid medium. The fertilised egg (zygote) is then transferred to the patient's uterus with the intent to establish a successful pregnancy.
IVF complications

• Multiple births- This is directly related to the practice of transferring multiple embryos at embryo transfer. Multiple births are related to increased risk of pregnancy loss, obstetrical complications, prematurity, and neonatal morbidity with the potential for long term damage.

• Also higher incidence of lower birth weights, pre-term births, and cerebral palsy
cont.

- birth defects - significantly more common in infants conceived through IVF, notably septal heart defects, cleft lip with or without cleft palate, esophageal atresia, and anorectal atresia

- heart defects, chromosomal abnormalities like Down syndrome, spina bifida, gastrointestinal abnormalities, musculo-skeletal, dislocated hips, and club feet.
Stats.

- The annual number of ART infant births increased 44% in 1997 to 31,582 in 2000.
- In 2008, IVF produced 61,426 babies, or 1% of all US babies.
- After 6 cycles of IVF, the success rate is 23-72%.
- IVF costs up to $15,000 per cycle, and it usually takes more than one cycle of treatment.
Questions

• Your friend is unable to have a biological child. Do you encourage ART, adoption, fostering, or alternative parenting?
• Can you suggest reasons why they might be happy without children?
• How important is a biological link to a child you raise?
Paying for ART

- VIDEO: http://www.thehastingscenter.org/Bioethicsforum/Post.aspx?
Assisted reproductive technologies

Judaism
Liberal Jewish values

- For the tradition, procreation normatively occurs within marriage and, ideally, conception arises from marital intercourse.
- For those outside this, the value of children, and a sense of compassion for individuals seeking to have a child can be used.
Liberal Jewish values

- Reproductive technology is seen, in Judaism, as partnership with God, allowing for a process of birth that is as natural as the process of producing food by farming.
Conservative Jewish Values

- the use of reproductive technology is untenable in light of the importance of love as a goal and precondition of sex.
- The act of love need be sought or desired for no reason other than the communion it expresses and embodies.
Conservative Jewish Values

• Producing a child in other ways seems to distort the moral meaning of the child; it removes the biological end of marriage from the context in which it is personalized and humanized
• Procreative sex and love must be united
Jewish concerns

- Some writers will express concern with technical issues, such as the manner in which sperm is obtained from the husband [i.e. masturbation]
- Many will note the medical risks, as well as the burdens and uncertainties of many procedures.
IVF – most accepted

• Nonetheless, general support for the legitimacy of the procedures remains strong.

• artificial insemination with a husband's sperm, for example, is almost universally accepted, by very traditionalist Orthodox authorities as well as by more Liberal thinkers

• In vitro fertilization, using a couple's own genetic materials, similarly enjoys wide acceptance.
IVF- problematic

• the use of donated sperm or eggs is more problematic.
• Because it can impinge on the exclusivity of the marital relationship.
• The impact on the relationship of the child with his or her parents, in light of genetic asymmetry is an issue
IVF- problematic

- the corrosive dangers of the secrecy that often accompanies the use of donor gametes is also a problem
- Still, even the use of donor sperm or eggs is accepted by some Orthodox authorities in selected cases, and more broadly among other Jewish thinkers.
Question

• Considering the mass genocides the Jewish people have endured, would you support more rigorous ART for Jewish people as a sort of “affirmative action” to even the numbers in the population?
Assisted reproductive technologies

Christianity
Presuppositions

• Christian churches have given voice to concerns over reproductive technologies and their implications for the family, society, and the church.

• We are responsible for future human beings who will be affected by our present actions and such responsibility obligates us to ensure the existence of future humanity.

• We might consider the possibility that the reason medicine has so much power over our lives is because we have too willingly assumed that suffering is pointless.
Authority

• the official Catholic teaching opposes IVF
• the Protestant churches lack formal consensus
• There are some agreements among Christians about moral behavior towards children
• This guides much in-vitro discussion
Catholic teachings

- natural law says the couple can be the only ones involved in the generation of their children.
- surrogacy and heterologous gamete donation would not be morally right.
- *Dignitas Personae* states that, “With regard to the *treatment of infertility*, new medical techniques must respect fundamental goods... [including] the unity of marriage, which means reciprocal respect for the right within marriage to become a father or mother only together with the other spouse.” This ensures that the bond between the couple is holistically reflected in progeny from them alone.
However....

• Interestingly, with stating the Catholic opposition to in-vitro, even when done under the strictest of auspices, couples choose to nevertheless pursue it.

• In *Donum vitae*, since 1987 the Church declares that “homologous IVF and ET fertilization is not marked by all that ethical negativity found in extra-conjugal procreation... [and] every child which comes into the world must in any case be accepted as a living gift of the divine Goodness and must be brought up with love.”
Sperm donation

• sperm donation required in heterologous protocols epitomizes the tendency to trivialize human sexuality.
• The child falls victim, as a rule the child is denied the right to know his own father. And the father removes himself from any responsibility for the child
• Unmarried couples, those with defective gametes, and single people should therefore not have ART available
Sperm retrieval

• In the most typical cases, semen is obtained from the husband most often through masturbation. This can be done on demand, with no outside instruments and the actual procedure is not costly.
• There is, however, a theological objection to onanism, even for the purposes of IVF.
• The Catholic Church has declared that in the case of gamete retrieval for men, “masturbation, through which the sperm is normally obtained, is another sign of this dissociation: even when it is done for the purpose of procreation, the act remains deprived of its unitive meaning.”
Acceptable sperm retrieval- not for IVF

- self-sealing prophylactic that is used during intercourse. This specialized condom allows semen to pass through the punctured barrier during marital intercourse and promptly seals itself to allow collection of sperm.
- Of course, this method is highly inefficient as the most virile and motile sperm will escape first through the condom, and the slower sperm will be collected in the condom
- sperm retrieval through aspiration of the testis with a needle, or puncturing with an automatic biopsy gun could be accepted by the Christian couple.
The embryo

• Since there is an inviolability of the innocent human beings right to life from the moment of conception until death”” than each embryo must be treated with dignity and respect as a human being

• Therefore creating more embryos than will be implanted is wrong

• On occasion, some of the implanted embryos are sacrificed for various eugenic, economic or psychological reasons. Some embryos are frozen for further use, or frozen and eventually
Although the Catholic Church is certainly against PGD for eugenic purposes, it supports couples by offering genetic counseling to the parents about disease transmission and responsible parenthood.

Genetic counseling may be provided in order to promote responsible parenthood and to prepare for the proper treatment and care of children with genetic defects, in accordance with Catholic moral teaching and the intrinsic rights and obligations of married couples.
Embryo reduction

• For the best chance for their pregnancy, implanting multiple embryos are appealing.
• On the other hand, if all of them would implant, there is likelihood of spontaneous abortion, miscarriage, or prematurity.
• For this reason, when multiple embryos manage to implant and develop into fetuses, selective fetal reduction is often required in order to ensure the survival of just one or two fetuses.
• If life begins at conception, then thus is abortion.
Protestant Teachings

- in parenting a child born of their own genetic material,
- this occurs in a life-long committed relationship.
- Children born of this union have the stability of two biological parents
- extracorporeal embryos should not be created by the process, which are not also transferred for gestation.
- Eugenic sex selection should be prohibited
- these parameters to ensure the maintenance of the unitive and procreative aspects of marriage.
Questions

• Is there a biblical precedent for reproducing?
• Must it be done at any cost?
ART Bibliography

- General
  - Adapted from “Contemporary Approaches to Bioethics”, EXP 0027. Taught at Tufts University, Spring 2012.
- Jewish ART
- Christian ART
  - Stanley Hauerwas, Suffering Presence: Theological Reflections on Medicine, the Mentally Handicapped, and the Church (Notre Dame: University of Notre Dame Press, 1986) 33.
  - William Wagner, “Public Policy Recommendations,” in Reproductive Technologies, Marriage and the Church, ed. Donald G.