Contraceptives are So Much More than ways to avoid unwanted pregnancies.

1. Menstrual cycle problems

1a. Heavy menstrual bleeding (HMB) affects 9-14% of women. *[Nelson A. and Baldwin S. IN Hatcher Contraceptive Technology 20th ed., 2011]*. **Because of missed work, women with HMB earn an average of $1,692 less annually than women with normal menses** *[Cote, 2002].*

CONTRACEPTION: The LNG IUD (Liletta & Mirena) was found to be more effective than prostaglandin inhibitors combined pills, progestin only pills and Depo-Provera at decreasing HMB *[Gupta, 2013]*.

1b. Painful menses (Dysmenorrhea) includes both pain and cramping.

CONTRACEPTIVES that may improve dysmenorrhea include the LNG IUD (Mirena, Liletta, Kyleena, or Skyla), Depo-Provera, Depo-sub Q 104, combined pills, NuvaRings, patches (now Xulan or Mylan), and progestin-only pills. Heat, exercise, wraps, NSAIDs, and alcohol may help to diminish pain. Exercise may increase or decrease dysmenorrhea.

1c. Endometriosis is an important cause of severe dysmenorrhea. It consists of endometrial glands and stroma outside the uterus.

CONTRACEPTION: Treatments that diminish or eliminate menses often successfully reduce symptoms of dysmenorrhea caused by endometriosis: The LNG IUD (most effective *[Vercellini, 2013] [Fidele,1997]*), Depo Provera and Depo sub Q Provera 104 and combined pills preferably taken continuously can all improve a woman's endometriosis. In the 1950's, combined pills taken continuously were used to treat endometriosis before they were approved in 1960 for contraception.

1d. Premenstrual syndrome (PMS)

CONTRACEPTION: Contraceptives most likely to have a beneficial effect are those that suppress ovulation and reduce the number of withdrawal bleeding episodes. Extended-cycle dosing of combined pills, vaginal contraceptive rings and Depo-Provera injections reduce the number of withdrawal bleeding episodes (and associated symptoms).

1e. Perimenopausal Issues If a perimenopausal woman is provided an estrogen, the progestin in a Levonorgestrel IUD may be better tolerated than Provera.

Answer to that riddle: there are still 3 frogs on the log. Deciding to jump is not the same as jumping.

2. Cancer and Contraceptives

2a. Ovarian cancer The most lethal of the female reproductive track cancers, may originate in either the ovary itself or in the fimbriated ends of the fallopian tubes that hover directly over the ovaries.

CONTRACEPTION: Possibly protection against ovarian cancer is the most important noncontraceptive benefit of pills. The protective effect of combined pills ranges from 40-80% and persists for 20-30 years after stopping pills *[Int J. Cancer, 1991] [Vessey,1995]*. Depo-Provera has a comparable protective effect against ovarian cancer.

2b. Endometrial hyperplasia and cancer

CONTRACEPTION: The reduction of endometrial cancer is about 80% in women using combined pills and Depo-Provera *[Int J. Cancer, 1991]*. The LNG IUD (Liletta & Mirena) prevents endometrial hyperplasia and endometrial cancer and is used to treat hyperplasia.

2c. Colon cancer

CONTRACEPTION: The Nurses Health Study reported a 40% reduced risk of colorectal cancer with 8 years of previous use of oral contraceptives. Fritz and Speroff conclude that *"Steriod contraception should be offered to women with a strong family history of colorectal cancer"* *[Fritz, Speroff, Clinical Gynecologic Endocrinology and Infertility 8th Ed., p1001, 2011]*.

3. Fibroids (myomata) of the uterine wall can cause pain, heavy bleeding, anemia, and lead to failure of implantation of a fertilized egg or to repeated early miscarriages. 99.5% of fibroids are benign.

CONTRACEPTION: The LNG IUD (Mirena) has been used to control heavy bleeding from fibroids and may decrease fibroid size *[Stewart, 2015][Mercorio, 2003]*. Some combined pills are associated with reduced risk of hospital referral for fibroids *[Guilleband, 2009]*. Low dose COCs do not stimulate fibroid growth but do decrease menstrual bleeding from fibroids *[Friedman, 1995]*. DMPA effectively decreases blood loss from myomas and may shrink myomas *[Venkatachalam, 2004]*.

4. Polycystic Ovarian Syndrome (PCOS) A common cause of infrequent bleeding that is associated with androgen excess (hirsutism, acne, male pattern balding), anovulation, obesity and infertility. Women with PCOS are at greater risk of developing diabetes, endometrial hyperplasia and endometrial cancer. Lifestyle changes to lose weight for long periods of time are important.

CONTRACEPTION: Progestins from an LNG IUD, Depo-Provera injections, and progestin-only pills provide substantial endometrial protection against endometrial cancer and good contraceptive efficiency. If a woman desires a monthly period and treatment of acne, combined pills may be more appropriate unless a woman is at increased risk for blood clots.

5. Acne is due to hair follicle occlusion. It can lead to follicle distention below the skin or impacted follicles with darkened masses that communicate with the exterior (blackheads). Larger cystic dilitations may lead to scarring. The face and upper torso are the areas most often affected.

CONTRACEPTION: It is generally accepted that all formulations of combined pills cause some improvement in acne in most users. "Low dose OC's improve acne regardless of which product is used" *[Speroff, Darney p.105 IN A Clinical Guide for Contraception and 5 more references!]* Combined pills reduce ovarian production of androgens and increase Sex Hormone Binding Goblulin (SHBG) resulting in greater binding of free testosterone.

6. Sickle Cell disease is a genetic disorder in which an abnormal hemoglobin molecule, hemoglobin S, causes red blood cells to become sickle-shaped.

CONTRACEPTION: Depo-Provera decreases in vivo sickling. Both the frequency and intensity of sickle cell crises are diminished in Depo and combined oral contraceptive users *[deAbood, 1997]*. Progestin only pills have similar beneficial effects.

7. Pelvic inflammatory disease leads to subsequent infertility - 12% after one episode of PID, 23% after 2 episodes and 54% after 3 episodes *[Westrom,1980]*.

CONTRACEPTION: Pills decrease the risk of hospitalization for PID by 50-60%, but at least 12 months of use of combined pills are necessary, and the protection is limited to current users *[Eschenbach, 1977] [Panser, 1991]*. LNG IUDs, such as Mirena, by thickening cervical mucus, having a 50% protective effect against PID *[Sivin,1991] [Toivanen, 1991]*. Thickening cervical mucus in woman using Depo-Provera may prevent ascent of pathogens to the upper genital track *[Lumbi Ganon,1996]*. Condoms are highy efective in protecting women against PID.

Robert A. Hatcher, MD, MPH; Emory University School of Medicine, Williams '59 Last edit - October 16, 2017
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World Population Growth and the History of Contraception

fhi Family Health International

"No woman can call herself free who does not own and control her body. No woman can call herself free until she can choose consciously whether she will or will not be a mother." *Margaret Sanger, 1920*

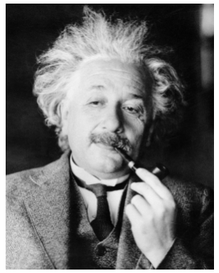
Robert A. Hatcher, MD, MPH; Emory University School of Medicine October 16, 2017

Presentation in Williamstown, MA , Oct. 17, 2017

Right Now

CONSIDER THIS RIDDLE

A riddle: Three frogs were sitting on a log. Two of them decided to jump off into the water. How many frogs were now on the log?



Today about half of all pregnancies in the United States are still unintended and close to half of all unintended pregnancies lead to abortions.

If the world wants to avoid the consequences of unintended and unwanted pregnancies, we will need to approach sex and contraception in a new way. Just remember Albert Einstein's definition of ***Insanity: doing the same thing over and over again and expecting different results.*** Here is what Jeffrey Peipert and Gina Secura did differently in St. Louis:

Gina Secura and Jeffrey Peipert

The remarkable **ST. LOUIS CONTRACEPTIVE CHOICE PROJECT** did provide contraceptives to 9,256 women very differently and 75% of them chose to use one of the long-acting reversible contraceptives. How did they accomplish this on a completely voluntary basis? Gina Secura and Jeffrey Peipert suggest three answers:

1. The **effectiveness** of IUDs and implants is the first thing a woman is told about when she is considering entering this project.
   "A woman is more than 20 times more likely to become pregnant if she uses pills, patches, or rings than if she uses an IUD or an implant."
2. **Access.** At all the sites it was possible for women to receive an IUD or an implant. Trained personnel were there. The IUDs and implants were there. Delay was minimized.
3. The price was right! Contraceptives and all other services were provided at **no cost at all**.

(Winner, Peipert, NEJM 2012) (Renee Mestad, et al. Contraception, 2011) (Peipert Obstet Gynecol, 2012)

Teen births fell to 6.3 per 1,000 in the Choice/St. Louis cohort vs. 34.3 per 1,000 in the U.S. (Peipert, Madden Obstet Gynecol, 2012)

Repeat abortions fell to less than half the national average. (Peipert, Madden Obstet Gynecol, 2012)

So what can we do differently to decrease the number of unintended pregnancies? Seven possibilities:

1. **Use more Long Acting Reversible Contraceptives: IUDs and implants.** These are also called the **forgettable** methods.
2. **ParaGard is the emergency contraceptive of choice.** When a woman has had unprotected sex, we can offer her an intrauterine contraceptive not emergency contraceptive pills. In one Asian study, IUD insertion within several days of unprotected sex led to not one pregnancy in 1,963 women (Godfrey 3 JOG 2010) and provides them long term highly effective contraception. Emergency contraceptive pills have almost no global effect at all.
3. **Place IUDs or an implant right after delivery.** Within 10 minutes of the delivery of the placenta, whether delivery is by caesarian section or vaginally, a copper T IUD or a levonorgestrel IUD may be placed. This may be done for breastfeeding and non-breastfeeding women. This has been accomplished for 4,000 women delivering vaginally using a sponge forceps that is longer so that it reaches all the way to the top of the fundus. The expulsion rate was 1.6%, and the cost of the forceps is $7. Immediately following uterine aspiration for an induced abortion or a miscarriage, place an IUD or an implant. (Bednarek NEJM June 9, 2011)
4. **Accurately describe the duration of effectiveness of our contraceptive options:**
   - ParaGard, the Copper T 380-A, is effective for at least 12 years
   - Mirena, the levonorgestrel IUD, is effective for at least 7 years
   - Nexplanon implants, the etonogestrel implants, are effective for at least 5 years
   - Depo-Provera injections are effective for 15 weeks
   - NuvaRings, ethinyl estradiol and etonogestrel rings, prevent ovulation for 35 days
5. **Quick start is the right way to start contraception.** Avoid delays: start each method NOW whenever possible.
6. **Tonight, use a condom, withdrawal, abstinence or outercourse.** Advice for anyone: if you are considering having unprotected vaginal sex when you do not want to become pregnant. **Make No mistakes. Not once. Not ever.**
7. **The money vein runs through the heart.** Since free contraceptives, sterilization or abortion are not available for everyone, here is a message for all sexually active women and men: If your heart is committed to never, ever having an unintended pregnancy, start a savings account dedicated to that goal. **Each girl, boy, woman and man should have such a savings account!** Sometimes contraception, sterilization or abortion can be quite expensive.

1 AD: 250 Million World population reaches 250 million, abstinence (particularly postpartum), withdrawal, lactation, intrauterine stones in camels, homosexuality and polygamy, lemons for their mechanical and spermicidal effect, unsafe abortion 5000 years ago using molokhia (same plant stem used in Egypt today). Stems of the molokhia plant range from .5 to 1.5 cm. The stems are pushed up into the uterine cavity through the cervix leading to an abortion (often to a septic abortion).

Molokhia

The History of Contraception and of Population Growth

2050: World population will reach 9.8 billion. By 2050, Africa's population is expected to be 2.5 billion, up from 1.2 billion in 2015. U.S. population is expected to be 398 million, up from 321 million in 2015. *[Population Reference Bureau, www.prb.org]*

2025: World population to reach 8 billion (this billion will take 14 years)

2017: Hurricane Harvey: over 50 inches of rain in Houston. Unprecedented surges in Florida. How did population contribute to this?
2016: FDA approves 19.5mg LNG IUD, Kyleena, for 5 years contraceptive use. Same size as Skyla but approved for more years
2016: 83% of people in the world are born in less developed countries [Population Reference Bureau, www.prb.org]
2015: Liletta, the latest LNG IUD available, less expensive than Mirena
2013: The mini-Mirena IUD called Skyla (13.5mg LNG) arrives in the USA. Inserter barrel 15% smaller. Approved for 3 years of contraceptive use
2012: Brooke Winner, Peipert, Zhao, Buckel, Maddon, Allsworth, Secura published the classical paper on the effectiveness of long acting reversible contraceptive in the St. Louis Contraceptive CHOICE Project. *[NEJM May 24, 2012]*

2011: World population reaches 7 billion (this billion took 12 years)
2011: 20th Edition of *Contraceptive Technology*
2006: First HPV vaccine, Gardasil, released
2002 and 1996: Forest, Hubacher and Grimes point out A GLOBAL PARADOX. "Although the most common reversible contraceptive in the world, it (the IUD) has the worst reputation of all contraceptives... except among those using IUDs." *[Hubacher D., Grimes DA. 2002; Forest JD. 1996]*
2001: Ortho Evra Patch and NuvaRing approved
2000: Women can vote in all but 3 countries (see 1898!!)

1999: World population hits 6 billion (this billion took 12 years)
1997: FDA approves emergency contraception pills
1996: World Health Organization publishes evidence-based guidelines on the safety of contraceptives for women with over 150 characteristics and medical conditions
1992: FDA approve Depo Provera Injections
1992: First female condom, Femidom, marketed in Denmark (Reality in USA)
1991: Sivin describes 7 year cumulative failure rate of LNG IUD of 1.1%

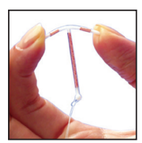
Nexplanon and Implanon Implants
The etonogestrel Implant
The most effective of all reversible methods. And for 4-5 years, more effective than most male or female sterilization procedures.

1988: Five years after its approval marketing of Copper T-380A begins
1987: World population reaches 5 billion (this billion took 12 years)
1983: FDA approves Copper T-380A IUD in the United States
1983: Implanon implant developed by Population Council and first approved in Finland (leads to Nexplanon)
1983: Jadelle implant developed by Population Council and first approved in Finland
1982: Baulieu describes medical abortion using mifepristone followed by misoprospol
1981: First case of HIV/AIDS described in MMRW (CDC)
1981: Garret Hardin writes "nobody ever dies of overpopulation" after 500,000 die from flooding of an overcrowded East Bengal River delta
1980s: Per capita caloric consumption starts to fall (held off for decades by the green revolution)

Jadelle Implant
The Levonorgestrel Implant
The least expensive of all implants.

1975: World population reaches 4 billion (this billion took 15 years)
1974: Al Yuzpe in Canada describes emergency contraception using Ovral pills
1973: FDA approves progestin-only pills (mini-pills)
1973: U.S. Supreme Court abortion decision: Roe v. Wade (TX) and Roe v. Bolton (GA)
1969: First edition of *Contraceptive Technology*
1969: Jaime Zipper in Chile describes suppression of fertility by intrauterine copper IUD *[Am J Obstet Gynecol, 1969]*
1968: Vatican pronouncement reaffirms opposition of Catholic Church to artificial contraception
1964: Dr. Alexander Langmuir makes family planning a public health priority at the Centers for Disease Control leading to training of Phillip Darney to whom with his wife Uta Landy, this edition of *Managing Contraception* is dedicated.

1960: It took but 30 years to add the 3rd billionth person to our little spaceship Earth
1960: Combined birth control pills (Enovid) formally approved by FDA
1950s: Birth control pills taken continuously to treat endometriosis
1942: American Birth Control League renamed Planned Parenthood
1937: American Medical Association ends long standing oppistion to contraception
1936: German gynecologist Friedrich Wilde describes first cervical cap (fitted from a wax impression)
1936: John Rook opens rhythm birth control clinic in Boston



The Copper T IUD

1930: World population now 2 billion (this billion took 100 years)
1930: Knaus (Austria) and Ogino (Japan) develop rhythm method
1930: Pope Pius XI in Of Chaste Marriage virulently attacks both contraception and abortion
1927: Novak (Hopkins) describes suction as means of performing an abortion
1920: Women can vote in the United States
1914: Margaret Sanger coins phrase "birth control" and fights for women's suffrage
1909: German surgeon Richard Richter reports success with silkworm-gut shaped into a ring
1898: New Zealand becomes the first country in the world where **women can vote**
1893: First vasectomy by Harrison in London
1882: First contraceptive clinic established in Amsterdam
1880: First tubal ligation and Dr. Wilhelm Mensinga invents a larger cervical cap eventually known as the diaphragm

Harrison found that vasectomy made a vast difference in a man's vas deferens

1800: It took many thousands of years, perhaps 300 to 400 thousand years, for world population to reach 1 billion people
1798: Thomas Robert Malthus proposes dismal economic theory that population growth eventually will exceed the ability of the earth to provide food, resulting in starvation
Late 1770's: Casanova popularizes condoms for infection control and contraception. He recounts his attempts to use the shelled out rind of a lemon as a cervical cap. Lemon juice is a strong spermicide.

LARC methods: IUDs and implants are highlighted yellow.

2040: 9 Billion
2025: 8 Billion
2017: 7.5 Billion
2011: 7 Billion
1999: 6 Billion
1987: 5 Billion
1975: 4 Billion
1960: 3 Billion
1930: 2 Billion
1800: 1 Billion

Each 100 years in the millennia prior to Christ, the total population on our little spaceship Earth increased by one-half of 1%. Births virtually equaled deaths.

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