Hot Topics in Contraceptives

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DISCLAIMER

- The term ‘*woman*’ or ‘man’ may be used throughout this presentation. It should be read as including nonbinary, gender diverse and transgender people who have the sexual and reproductive organs appropriate for the information.

Objectives

- Describe recent advances in contraceptive technology.
  - Participants will be able to identify at least three new or emerging contraceptive methods and explain their clinical applications for males and females.
- Analyze current challenges and disparities in contraceptive access
  - Participants will discuss systemic, cultural, and policy-related barriers to equitable contraception and propose strategies to address them.
- Apply patient-centered approaches to contraceptive counseling
  - Participants will demonstrate understanding of shared decision-making principles and tools that support individualized contraceptive care.

Advances in Contraceptive Methods

- Long-acting options
- Innovations
  - Male and Female
  - Hormonal and non-hormonal
- Emerging trends

Long Action Options

- Annovera®
- Hormonal IUDs
- Biodegradable implants

Annovera®

Feature	**Annovera®**	**NuvaRing®**
Duration of Use	1 ring lasts **1 year (13 cycles)**	Each ring lasts **1 cycle (3 weeks)**
Regimen	Insert for 21 days, remove for 7 days; reuse same ring	Insert for 21 days, remove for 7 days; **new ring each cycle**
Storage	**No refrigeration required**	Requires refrigeration before dispensing
Hormones	Segesterone acetate + Ethinyl estradiol	Etonogestrel + Ethinyl estradiol
Insertion/Removal	Self-managed, reusable	Self-managed, disposable
Cost & Access	Higher upfront cost, but cost-effective over 1 year	Lower per ring, but recurring cost
BMI Limitation	Limited data for BMI >29 kg/m²	Similar caution for high BMI

Hormonal IUDs

- New levonorgestrel systems effective up to 8 years (Mirena)
  - Still 99% effective
  - Only approved for up to five years for treating heavy periods.

Biodegradable implant under development

- Prototype is called Casea S
- Deliver a contraceptive hormone (typically etonogestrel)
- Intermediate duration (about 18–24 months)
- No removal procedure
  - Naturally dissolve in the body, eliminating the need for surgical removal reducing pain, scarring, and cost
- Challenges
  - Biodegradation concerns that assures the material dissolves safely without side effects
  - Regulatory approval will require extensive safety data and long-term studies
  - Extensive education and trust

Non-hormonal innovations---Phexxi

- What is it?
  - **FDA-approved,** hormone-free vaginal gel indicated for on-demand contraception
  - Active ingredients: lactic acid (1.8%), citric acid (1%), potassium bitartrate (0.4%)
  - Supplied in pre-filled, single-use 5 g applicators; each box contains 12 applicators
- MOA: First-in-class vaginal pH modulator (not a spermicide)
  - Maintains acidic vaginal pH (3.5–4.5)
  - Acidic environment + viscous gel reduces sperm motility and creates a physical barrier
- Dosing
  - One applicator intravaginally immediately before or up to 1 hour before intercourse
  - If intercourse does not occur within 1 hour, or if repeated acts occur, apply a new dose.
  - Can be used any time in menstrual cycle and with most barrier methods (condoms, diaphragms)
- Effectiveness
  - Typical-use failure rate: Pearl Index 27 (similar to condoms)
  - Perfect use: 6.7% pregnancy rate over 7 cycles.
- Safety
  - Avoid in women with recurrent UTIs or urinary tract abnormalities.
  - Common adverse effects (≥2%): vulvovaginal burning, pruritus, mycotic infection, UTI, bacterial vaginosis, discharge, dysuria.
  - No systemic hormonal side effects;
  - Safe for breastfeeding
  - Avoid use with vaginal rings (Material incompatibility)
- Counseling
  - Does not protect against STIs
  - Teach proper insertion technique and emphasize one dose per act.
  - Discuss potential for mild local irritation and when to seek care for UTI symptoms

Non-Hormonal in development

- Immunocontraceptives
  - Vaccines targeting proteins or sperm antigens to prevent fertilization
- Barrier Methods
  - New diaphragm designs---Silicone-based, easier self-insertion, and paired with non-spermicidal gels.
  - Reusable cervical caps with improved fit and comfort.
- Copper Based
  - Next-generation copper IUDs
    - Smaller, lower-dose copper designs to reduce cramping and bleeding while maintaining efficacy.
  - Copper microneedle patches (in development)
    - Deliver localized copper ions transdermally for temporary contraception.

Male Contraceptives---In Development and Clinical Trials

- Why does this matters?
  - Expands male contraceptive options beyond condoms and vasectomy
  - Promotes shared responsibility in family planning.
  - Surveys show >70% of men would use a novel male contraceptive if available.
- Hormonal
  - Topical Gel that combines a synthetic progestin and testosterone and is applied daily to the shoulders to suppress sperm creation while maintaining healthy testosterone levels.
  - Oral pill that with dual action of androgens and progestins to suppress the hormones luteinizing hormone (LH) and follicle-stimulating hormone (FSH) that are necessary for sperm production.
- Non-Hormonal
  - Oral pill to prevent sperm production by blocking RAR-α, which interferes with vitamin A signaling, which is essential for male fertility and sperm production
  - Injectable hydrogel designed to act like an IUD for men, blocking sperm in the vas deferens. It is a long-lasting, reversible non-hormonal contraceptive.

Testosterone-Progestin Gel (Hormonal Approach)

- Nestorone®
  - A transdermal gel combining progestin and testosterone.
- Mechanism:
  - Progestin suppresses luteinizing hormone (LH) and follicle-stimulating hormone (FSH), reducing sperm production.
  - Testosterone maintains normal androgen-dependent functions (libido, muscle mass) while preventing side effects of low testosterone.
- Application: Daily on shoulders/upper arms; absorbed through skin.
- Efficacy:
  - Clinical trials show sperm counts drop below 1 million/mL (contraceptive threshold) in most men within 8–15 weeks.
  - Reversible after discontinuation.
- Safety:
  - Mild side effects: acne, mood changes, weight fluctuations.
  - No major adverse events reported in Phase II trials.
- Status:
  - Large Phase IIb trials funded by NIH NICHD and Population Council are ongoing internationally
  - If approved, this would be the first male-controlled, reversible hormonal method

EPPIN Inhibitors (Non-hormonal)

- EPPIN (Epididymal Protease Inhibitor)
  - Protein on sperm surface essential for motility
  - Medication targets sperm motility
- Mechanism:
  - Small molecules (e.g., EP055) bind EPPIN, blocking interaction with semenogelin, which immobilizes sperm
  - Does not affect testosterone or libido, avoiding hormonal side effects
- Delivery:
  - Oral formulations and long-acting injectable implants under development
  - Rapid onset
  - Reversible
  - User-controlled
- Research Status:
  - Preclinical studies show temporary sperm immobilization without systemic toxicity
  - Human trials anticipated
- Advantages:
  - Non-hormonal, fewer systemic effects
  - Potential for on-demand contraception or sustained-release implants
- Challenges:
  - Ensuring complete reversibility and safety.
  - Scaling from animal models to human trials.

Emerging Trends

- Digital health tools
  - Apps for fertility awareness and telehealth counseling are expanding access.
- Self-managed contraception
  - OTC progestin-only pills and IUD self-removal options are gaining traction.
- Multipurpose prevention technologies
  - Combining contraception with STI protection is a major research focus.
- Personalization
  - Movement toward patient-centered and shared decision-making rather than efficacy-only counseling

Current Challenges and Disparities in Contraceptive Access

- Systemic
- Cultural
- Policy
- Strategies

Systemic

- Cost and Insurance Gaps
  - High out-of-pocket costs for certain methods
  - Inconsistent coverage under private plans and Medicaid
- Provider Shortages
  - Limited access in rural areas (contraceptive deserts)
- Infrastructure Issues
  - Lack of stocked methods in clinics
  - Supply chain disruptions

Cultural

- Misinformation and Myths
  - Social media and AI amplifies fears about hormonal methods and infertility
- Language and Literacy
  - Counseling materials often not culturally tailored or in a variety of languages
- Trust and Autonomy
  - Historical coercion and bias in family planning create distrust among marginalized communities

Policy

- State-Level Restrictions (Post-Dobbs)
  - Clinic Closures
  - Service disruption
    - Provider risk
  - Decrease funding
  - Insurance and coverage threats
  - Confusion on legality
    - Plan B example
- Age and Consent Laws
  - Adolescents face parental consent requirements in some states.
- Telehealth Limitations
  - Regulatory hurdles for prescribing contraception remotely.
- Providers not practicing to the full extent of license

Strategies to Address Disparities

- Expand OTC access
- Implement greater access to telehealth
- Train providers in bias-awareness and trauma-informed care
- Advocate for policy reforms ensuring coverage and eliminating consent barriers
  - Vote
  - Get involved
- Develop education programs to counter misinformation
  - Community based

Patient Centered Counseling

- Respect Autonomy
  - Prioritize the patient’s values, preferences, and reproductive goals
- Shared Decision-Making
  - Present options clearly
  - Discuss benefits/risks
  - Support informed choice
- Non-Directive Approach
  - Avoid steering patients toward specific methods
  - Focus on what matters most to them

Key Strategies

- Start with Patient Goals
  - One Key Question
- Address Patient Personal Barriers
  - Cost, access, cultural beliefs, and health concerns
- Communication
  - Ask open-ended questions
    - “What matters most to you about birth control?” (effectiveness, reversibility, side effects)
  - Use gender-neutral language and respect diverse identities
  - Incorporate trauma-informed care principles for patients with sensitive histories
  - Provide language access and culturally relevant materials
  - Create a safe space for discussing myths, fears, and misconceptions

Provider Tools to Support Tools to Support Individualized Care

- Decision Aids (Tools)
  - MyBirthControl.org
  - Bedsider.org
- Tiered Counseling with Personalization
  - Present most effective methods first
  - Tailor based on patient priorities
- Teach-Back Method
  - Confirm understanding by asking patients to explain their plan in their own words.

Teach-Back Method Steps for Providers

1. Explain the Information Clearly
    - Use plain language and avoid jargon
    - Break down complex concepts into smaller parts (MOA, side effects, dosing)
2. Ask the Patient to Repeat in Their Own Words
    - Example: *“Just so I know I explained it well, can you tell me how you’ll use this method?”*
    - Avoid yes/no questions like “Do you understand?”
3. Check for Accuracy
    - Listen for gaps or misunderstandings
    - Clarify and correct any errors without judgment
4. Re-Explain if Needed
    - Use different words if the patient struggles
    - Visuals tolls can be very helpful
    - Repeat until the patient demonstrates accurate understanding
5. Document Understanding
    - Note that teach-back was performed and patient demonstrated comprehension

Case Study Scenario

- Maria, a 28-year-old patient identifying as female and living in a rural area, visits your clinic seeking birth control. She has two male partners. She expresses concern about hormonal methods due to side effects she read about online and fears future restrictions on contraception after recent policy changes in her state. She wants something effective, reversible, and easy to manage without frequent clinic visits.

Case Study Discussion

- Identify Challenges/Barriers
- Patient-Centered Approach Strategies
- Management Options
- Take-Away

Case Study “Answers”

- Identify Challenges
  - Limited local access to providers and contraceptive options.
  - Misinformation about hormonal methods and legality of emergency contraception.
  - Cultural and systemic barriers: distrust of healthcare system, cost concerns.
- Patient-Centered Approach Strategies
  - Use open-ended questions: “What matters most to you about birth control?”
  - Apply shared decision-making: Present options (Annovera®, copper IUD, Phexxi®) with pros/cons.
  - Use Bedsider comparison chart and teach-back method to confirm understanding.
- Management Options
  - Discuss non-hormonal options (Phexxi®, copper IUD) and long-acting methods (Annovera®).
  - Counseling---Address myths and clarify legality of emergency contraception
  - Explore telehealth for ongoing access
- Take-Away
  - Empower Maria with accurate information and tools to choose a method aligned with her values and lifestyle

Take Home message

“By embracing innovative contraceptive options, breaking down access barriers, and empowering patients through shared decision-making patients will truly benefit from individualized contraceptive care.”

References

- Agency for Healthcare Research and Quality. (2020). Health literacy universal precautions toolkit, 2nd edition: Teach-back. Retrieved from https://www.ahrq.gov/health-literacy/improve/precautions/tool5.html
- Anderson, D. (2022, November 30). *A new breed of nonhormonal birth control*. Boston University Contraceptive Development Research Center. Retrieved from https://sites.bu.edu/bostoncrc/2022/11/30/a-new-breed-of-nonhormonal-birth-control/ [sites.bu.edu]
- Contraceptive Technology. (2018, August 10). The scoop on two new FDA-approved contraceptive methods. Retrieved from https://contraceptivetechnology.org/the-scoop-on-two-new-fda-approved-contraceptive-methods/
- Evoke Biosciences. (2023). *Phexxi vaginal gel: Full prescribing information*. Retrieved from https://www.phexxi.com/hubfs/PhexxiUSPI.pdf [phexxi.com]
- FHI 360. FHI 360 conducting trial for Casea S, a biodegradable contraceptive implant. Published February 20, 2024. Accessed November 21, 2025. https://www.fhi360.org/news/fhi-360-conducting-trial-casea-s-biodegradable-contraceptive-implant [fhi360.org]
- FHI 360. Development of a Biodegradable Implant for Contraception. Project page. Accessed November 21, 2025. https://www.fhi360.org/projects/development-biodegradable-implant-contraceptionU.S. Food and Drug Administration. (2018). Annovera (segesterone acetate and ethinyl estradiol vaginal system) prescribing information. Retrieved from https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/209627s000lbl.pdf
- Gao, W., Shen, X., Li, P., Xiao, C., & Wang, Y. (2025). Advances in contraceptive vaccine development: A comprehensive review. *Vaccines, 13*(7), 692. https://doi.org/10.3390/vaccines13070692
- Guttmacher Institute. (2023). Impacts of the Dobbs decision on contraceptive access and reproductive health services. Retrieved from https://www.guttmacher.org/article/2023/impacts-dobbs-decision-contraceptive-access
- Jackson, W. (2025, March 14). Novel male contraceptives — hormonal or non-hormonal? A summary of research and new developments. *The Oxford Scientist*. Retrieved from https://oxsci.org/novel-male-contraceptives-hormonal-or-non-hormonal-a-summary-of-research-and-new-developments/ [oxsci.org]
- Kaiser Family Foundation. (2023). Contraceptive access in the post-Dobbs era: State-level policy changes and implications. Retrieved from https://www.kff.org/womens-health-policy/issue-brief/contraceptive-access-post-dobbs/
- Male Contraceptive Initiative. (2024). Non-hormonal male contraceptive development pipeline. Retrieved from https://www.malecontraceptive.org
- O'Rand, M. G., & Silva, E. J. (2020). Eppin: An epididymal protease inhibitor and a target for male contraception. Biology of Reproduction, 103(2), 230–238. https://doi.org/10.1093/biolre/ioaa070
- Population Council. (2022). Advancing male contraceptive research: Hormonal and non-hormonal approaches. Retrieved from https://www.popcouncil.org/research/male-contraceptive-development
- U.S. Food and Drug Administration. (2018). Annovera (segesterone acetate and ethinyl estradiol vaginal system) prescribing information. Retrieved from https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/209627s000lbl.pdf