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Advantages and Disadvantages of Long-Acting Reversible Contraceptives (LARC): An Evidence-Based Review

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ABSTRACT

Long-acting reversible contraceptives (LARCs)—including copper intrauterine devices (IUDs), levonorgestrel-releasing IUDs, and the etonogestrel implant—are the most effective reversible methods of contraception. This narrative review synthesizes clinical efficacy and safety data together with evidence on awareness and misconceptions, with emphasis on adolescents and young adults. LARCs offer top-tier effectiveness (<1% typical-use failure), high continuation and satisfaction, rapid return to fertility, and important non-contraceptive benefits (e.g., treatment of heavy menstrual bleeding). Disadvantages include insertion requirements, bleeding changes, rare complications (expulsion and perforation), and persistent knowledge gaps that limit uptake. Evidence-informed counseling, trained providers, and removal of cost barriers are key to maximizing benefits while minimizing harms.

Keywords: *LARC; intrauterine device; etonogestrel implant; contraceptive counseling; adolescents; effectiveness; safety.*

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1. INTRODUCTION

Beyond individual efficacy, LARCs affect population health by reducing unintended pregnancies, spacing births, and decreasing abortion rates where access and counseling are optimized [3,19,20]. These downstream effects translate into measurable improvements in maternal and neonatal outcomes, especially where access to comprehensive reproductive services is uneven [1,22]. LARCs comprise hormone-free copper IUDs, levonorgestrel intrauterine systems (LNG-IUS), and subdermal etonogestrel implants. Their high real-world effectiveness results from minimal user dependence, narrowing typical- versus perfect-use gaps [1]. Contraceptive surveillance highlights continued reliance on user-dependent methods, indicating opportunity for LARC expansion [3,19]. Guidelines and technical resources designate LARCs as first-line options when person-centered counseling is provided [1,16,18,22].

2. METHODS

We conducted a narrative synthesis centered on two comprehensive sources: a clinical review of LARC efficacy and safety [1] and a systematic review/meta-analysis of awareness, knowledge, and misconceptions among adolescents and young people [2]. To enhance breadth, we integrated additional primary and secondary studies cited within these works, prioritizing large cohorts, randomized or quasi-experimental evidence, and authoritative guidelines where available. Citations are presented in Vancouver style and numbered by order of appearance.

3. LARC METHODS AND MECHANISMS

Design refinements include smaller-frame LNG-IUS options and improved inserters intended to lower procedure time and discomfort, potentially enhancing acceptability among nulliparous users [1,5]. Pharmacokinetic studies of etonogestrel document a gradual decline in release rates over time while maintaining levels sufficient for ovulation suppression throughout labeled duration [5]. Copper IUDs release copper ions that impair sperm motility/viability and inhibit fertilization [1]. LNG-IUS thickens cervical mucus, suppresses endometrium, and may inhibit ovulation; it also reduces menstrual blood loss [1]. The etonogestrel implant provides steady systemic levels with ovulation suppression and cervical-mucus effects; pharmacokinetic data document sustained release compatible with multi-year contraception [5].

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Ultrasound and ovarian-function studies during implant use show occasional follicular activity without contraceptive failure [8,9].

4. EFFECTIVENESS AND CONTINUATION

Continuation is a composite outcome shaped by counseling quality, early side-effect management, and access to same-day services. Programs that pair anticipatory guidance with easy removal on request report higher satisfaction and lower discontinuation due to bleeding [2,12,18,22]. Typical-use failure rates for LARCs are <1% per year, surpassing short-acting methods and rivaling sterilization [1,2]. Across 11 clinical trials of the etonogestrel implant, pregnancy indices were extremely low over >20,000 cycles [4,10]. Four-year pilot cohorts reported no in-use pregnancies, supporting durable effectiveness [6,7]. National datasets and international analyses also show lower failure with IUDs compared with short-acting methods [21]. Continuation/satisfaction improve with method-neutral counseling and reduced cost/logistical barriers [2,18,22].

5. ADVANTAGES

Top-tier effectiveness without daily, weekly, or pericoital action; long duration of action and favorable cost per year; rapid return to fertility after removal; and non-contraceptive benefits (LNG-IUS reduces heavy menstrual bleeding by ~80–90% and improves dysmenorrhea) [1]. Copper IUDs provide emergency contraception when inserted within five days of unprotected intercourse [1]. Absence of estrogen broadens eligibility among those with contraindications to combined hormonal methods [1,16].

6. DISADVANTAGES AND ADVERSE EFFECTS

Early irregular bleeding typically abates over time for LNG-IUS and implants; offering short courses of NSAIDs or combined hormonal pills (where medically eligible) can help manage unscheduled bleeding episodes [1,12]. Post-marketing data emphasize the importance of correct insertion technique and awareness of drug interactions with enzyme-inducing medications for implant users [14,15,17]. Bleeding changes are the most frequent adverse effect: heavier menses/dysmenorrhea with copper IUDs; irregular, frequent, or prolonged bleeding—and later amenorrhea—with LNG-IUS and implants [1,12]. Non-menstrual adverse events on implants are generally infrequent and mild [14]. Insertion/removal are office procedures with low complication rates under trained providers [1,17]. Post-marketing case series identified rare unintended pregnancies with implants, often due to insertion errors or drug interactions; training and verification mitigate these risks [15]. PID risk after IUD insertion is low and largely limited to the initial weeks in the setting of an untreated STI, manageable with guideline-based screening/treatment [16,22].

7. SPECIAL POPULATIONS AND TIMING

Adolescents and nulliparous individuals are candidates for LARC with high satisfaction/continuation when counseling sets realistic bleeding expectations [2,22]. Immediate postpartum and post-abortion initiation expands uptake but requires counseling on a modestly higher expulsion risk for immediate postpartum IUDs [1,22]. LNG-IUS and implants also provide symptom benefits in selected conditions such as heavy menstrual bleeding and endometriosis [1,11].

8. AWARENESS, KNOWLEDGE GAPS, AND COUNSELING

Provider education remains central. Structured, simulation-based workshops increase confidence and procedural competence, narrowing the gap between evidence and routine practice [18,22]. Public messaging that normalizes expectable bleeding changes can counter myths without minimizing patient concerns [2]. Awareness remains incomplete among adolescents/young adults; persistent misconceptions include infertility risk, unsuitability for nulliparous users, and STI protection [2]. Practice and policy barriers—cost, clinic workflows for same-day insertion, and provider comfort—limit adoption [18,22]. Regional attitudes toward IUDs vary (e.g., Europe vs. U.S.), reflecting historical experiences and public messaging [19,20].

9. IMPLEMENTATION AND PROGRAME DESIGNING

Cost-removal policies (public financing or insurance coverage) consistently improve uptake and reduce method-switching. Clinic readiness also includes reliable inventory systems, follow-up protocols, and quality assurance for insertion/removal procedures [1,18,22]. Task-sharing models that empower trained nurses and midwives have expanded access in diverse settings [1,2].

Programs that ensure same-day availability, trained inserters, analgesia options, removal on request, and low/no

out-of-pocket costs see higher uptake/continuation [1,2,18,22]. Clinic readiness, inventory, and clear management pathways for troublesome bleeding (e.g., short NSAID courses where appropriate) support continuation [1,12,18]. Pharmacokinetic and interaction counseling are important for implant users on enzyme-inducing drugs [5,14,15].

10. ETHICAL CONSIDERATIONS

Care must be voluntary and free from coercion. Counseling should align method attributes—bleeding patterns, side-effects, reversibility, and condom-based STI protection—with user preferences, and guarantee timely removal on request [2,18].

11. CONCLUSION

Given the weight of evidence, integrated strategies spanning counseling, financing, training, and supply chains are likely to yield the greatest gains in LARC uptake and satisfaction, while preserving patient autonomy [1–3,16,18,22].

LARCs combine unmatched contraceptive effectiveness with favorable safety and acceptability. Addressing awareness, access, and expectation-setting—rather than device design—is central to broader uptake. Scaling evidence-based counseling and streamlined access models can help realize LARCs' public-health potential while protecting autonomy [1–3,16,18,22].

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