

UNDERSTANDING PROVIDER KNOWLEDGE AND AWARENESS ABOUT LONG-  
ACTING REVERSIBLE CONTRACEPTIVES

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**Title**

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ABOUT LONG-ACTING REVERSIBLE CONTRACEPTIVES

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## **ABSTRACT**

Unplanned pregnancies have individual, familial, and societal consequences and continue to occur in the United States with over two million women experiencing an unplanned pregnancy each year (GI, 2016). Long-acting reversible contraceptives (LARCs) are highly effective methods yet underutilized within the United States. LARCs are considered a safe form of contraception that is not reliant upon the user for efficacy (Strasser et al., 2016). Provider interest, beliefs, knowledge, and training pose a significant barrier to LARC utilization (Shoupe, 2016).

This practice improvement project aimed to understand the current knowledge and beliefs of healthcare providers as well as provide information about evidence-based contraceptive counseling and LARCs. Following collection of an online LARC questionnaire, the project intervention included design and implementation of an educational hands-on training session. The online LARC questionnaire was sent to healthcare providers across Minnesota and North Dakota with the goal to assess the provider's knowledge, training, beliefs, and interests related to LARC utilization. The training session consisted of an educational presentation followed by insertion and removal training for one specific LARC method with nurse practitioners from across the region.

A total of 166 individuals initiated the questionnaire and 147 responses were considered eligible for analysis. Results demonstrated providers in family medicine report less comfort providing LARC counseling than providers within the OB/GYN specialty. Fewer family medicine providers were trained to perform LARC insertion; consistent with findings in the review of literature. An assessment of the provider's knowledge on recommending LARCs in females with coexisting conditions demonstrated uncertainty with current medical eligibility

criteria published by the Center for Disease Control and Prevention. Tiered-effectiveness counseling is underutilized with only 18.6% reporting it as their primary contraceptive counseling method. The educational presentation had 14 participants in the audience; a total of eight participants completed the post-training evaluation questionnaire. Following the training, 100% of participants planned to utilize tiered-effectiveness counseling and insert LARCs in their practice.

Knowledge gaps and barriers to LARC utilization continue to exist. Additional interventions targeting the provider and patient-linked barriers are needed to decrease unintended pregnancies in the United States.

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## **DEDICATION**

I dedicate this dissertation to my daughter, Ellie.

## TABLE OF CONTENTS

ABSTRACT .....	iii
ACKNOWLEDGEMENTS .....	v
DEDICATION .....	vi
LIST OF TABLES .....	x
LIST OF FIGURES .....	xi
LIST OF ABBREVIATIONS.....	xii
CHAPTER ONE. BACKGROUND AND SIGNIFICANCE .....	1
Unintended Pregnancies in the United States.....	1
Long-Acting Reversible Contraception.....	2
Contraceptive Recommendations .....	3
Significance of Proposed Project .....	3
Project Purpose and Objectives .....	4
Objectives .....	5
CHAPTER TWO. LITERATURE REVIEW .....	6
Long-Acting Reversible Contraceptives .....	6
Method Types .....	6
Mechanism of Action .....	7
Efficacy, Safety, Side Effects and Benefits.....	8
Barriers to Long-Acting Reversible Contraception Use .....	10
Provider Knowledge.....	11
Myths and Misconceptions.....	14
Economic Considerations .....	14
Improving Uptake.....	17
Theoretical Framework .....	17

Diffusion of Innovations Theory .....	18
CHAPTER THREE. PROJECT DESCRIPTION.....	22
Project Design .....	22
Logic Model .....	24
Institutional Review Board.....	25
CHAPTER FOUR. EVALUATION.....	26
Evaluation.....	26
Objective One .....	27
Objective Two .....	28
Objective Three .....	28
Objective Four .....	29
CHAPTER FIVE. RESULTS .....	30
Presentation of Findings .....	30
Participant Demographics .....	30
Participant LARC Training Response .....	31
Counseling Comfort Level .....	32
Recommendations for Medical Conditions .....	35
Frequency of LARC Discussion.....	36
Contraceptive Counseling Approach.....	38
IUD and Implant Insertion.....	40
Barriers to Increasing LARC Utilization.....	42
LARC Eligibility and Safety Concerns .....	42
Educational Needs .....	44
Post-Training Questionnaire Results .....	45
CHAPTER SIX. DISCUSSION AND RECOMMENDATIONS .....	46



Interpretation of Results .....	46
Objective One .....	46
Objective Two .....	46
Objective Three .....	49
Objective Four .....	50
Limitations.....	50
Recommendations .....	51
Implications for Practice .....	53
Implications for Future Research .....	53
Application to Other Doctor of Nursing Practice Roles.....	55
REFERENCES .....	57
APPENDIX A. ONLINE LARC NEEDS ASSESSMENT .....	65
APPENDIX B. INSTRUMENT PERMISSION.....	72
APPENDIX C. POST TRAINING QUESTIONNAIRE.....	73
APPENDIX D. IRB DETERMINATION .....	74
APPENDIX E. LARC TRAINING PRESENTATION.....	75
APPENDIX F. EXECUTIVE SUMMARY .....	79

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Demographic of Participants.....	31
2. LARC Training .....	32
3. Counseling Comfort Level.....	33
4. Recommendations for LARC in Coexisting Condition .....	35
5. LARC Discussion for Females Seeking Contraception .....	36
6. Barriers to Increasing LARC Utilization .....	42
7. IUD Eligibility .....	43
8. Concerns Preventing IUD Recommendation.....	44
9. Post-Training Evaluation Questionnaire Response .....	45

## LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Effectiveness of Family Planning Methods. Reprinted from ‘Center for Disease Control and Prevention,’ by U.S. Department of Health and Human Services, n.d., Retrieved from <a href="https://www.cdc.gov">https://www.cdc.gov</a> .....	12
2. Innovation-Decision Process (Rogers, 2003) .....	19
3. Project Interventions Integrated into Innovation-Decision Process.....	24
4. Logic Model.....	25
5. Objectives and Evaluation Method.....	27
6. Counseling Comfort, Copper T IUD .....	33
7. Counseling comfort, Levonorgestrel-releasing IUD.....	34
8. Counseling comfort, Etonogestrel implant .....	34
9. Frequency of Implant Discussion by Specialty .....	37
10. Frequency of IUD Discussion by Specialty .....	37
11. Primary Approach to Contraceptive Counseling by Specialty .....	38
12. Recommending IUDs or Implants as First-Line Contraception by Specialty .....	39
13. Providers Inserting IUDs by Specialty .....	40
14. Providers Inserting Implants by Specialty .....	41

## LIST OF ABBREVIATIONS

AAFP .....	American Academy of Family Physicians
AAP.....	American Academy of Pediatrics
ACA .....	Affordable Care Act
ACOG .....	American Congress of Obstetricians and Gynecologists
APHA.....	American Public Health Association
CDC .....	Center for Disease Control and Prevention
DNP.....	Doctor of Nursing Practice
FDA.....	United States Food and Drug Administration
GI .....	Guttmacher Institute
HHS.....	US Department of Health and Human Services
IUD .....	Intrauterine Device
LARC .....	Long-acting reversible contraceptive
MEC.....	Medical eligibility criteria
PID .....	Pelvic inflammatory disease
SARC .....	Short-acting reversible contraceptive
STI.....	Sexually transmitted infection
WHO.....	World Health Organization

## **CHAPTER ONE. BACKGROUND AND SIGNIFICANCE**

### **Unintended Pregnancies in the United States**

Unintended pregnancies are a public health challenge within the United States.

Decreasing unintended pregnancies is a national priority addressed in Healthy People 2020 and defined as any pregnancy which is mistimed or unwanted (US Department of Health and Human Services [HHS], 2018). The United States has higher rates of unintended pregnancies and abortions than many other developed countries (American Congress of Obstetricians and Gynecologists [ACOG], 2016). Approximately 49 percent of pregnancies are unintended in the United States resulting in an additional 21 billion dollars in health care spending (ACOG, 2016; Guttmacher Institute [GI], 2016). It is estimated half of the United States population will experience an unintended pregnancy by age 45 (GI, 2016). In North Dakota, 44 percent of all pregnancies were unintended in 2010 with 17% of the unintended pregnancies resulting in abortion (GI, 2016).

Unintended pregnancies have individual, family, and societal implications. An unintended pregnancy has been associated with many negative health outcomes, including delayed prenatal care, maternal depression, decreased likelihood of breastfeeding, and increased risk of physical violence (HHS, 2018). The large number of unintended births within the United States is placing a large burden on state and federal governments. Public insurance plans, including Medicaid and Children's Health Insurance Program (CHIP), are essential to funding care for unintended pregnancies and births. Approximately two-thirds of unintended pregnant females utilized public insurance plans in 2010 (Sonfield & Kost, 2015). Following an unintended birth, a mother is less likely to graduate high school and college, more likely to earn less than those who delay childbearing, and require federal assistance (HHS, 2018).

## **Long-Acting Reversible Contraception**

Approximately half of the unintended pregnancies across the United States occur due to not utilizing contraception or contraception misuse. The other half occur in women who become pregnant despite contraception use (Center for Disease Control and Prevention [CDC], 2016). Many forms of contraception exist. Two major classes include short-acting reversible contraceptives and long-acting reversible contraceptives. Short-acting reversible contraceptives (SARCs) include oral contraceptives, contraceptive patch, vaginal ring, and injectables. SARCs have historically been the most popular options for contraception within the United States (Peck, 2013). Long-acting reversible contraceptives (LARCs) includes intrauterine devices (IUD), both hormonal and non-hormonal options, and subcutaneous hormonal implants. The percentage of women utilizing LARC methods has remained relatively low in the past 50 years. Current estimates report between seven and eleven percent of women utilized LARC options in 2013 (HHS, 2015; Daniels, Daugherty, Jones, & Mosher, 2015).

Trussell et al. (2013) reported imperfect adherence or improper use as a leading cause of unintended pregnancy, which is common among SARC methods. LARCs are highly effective options for contraception. Less than one in one hundred women will become pregnant while utilizing LARC methods (ACOG, 2016; CDC, 2016). The efficacy on SARC methods varies greatly. Approximately nine in one hundred women will become pregnant while utilizing oral contraceptives, contraceptive patches, and vaginal rings (CDC, 2016). LARC methods last for several years with the subcutaneous hormonal implant lasting three years, hormone-releasing IUD options lasting three to five years, and non-hormonal IUD option lasting ten years (CDC, 2016). Noncompliance and a higher failure rate have been associated with SARC methods due to

the user's required intervention daily, weekly, or monthly. Unlike SARC methods, LARCs do not require regular compliance and do not result in improper adherence (Trussell et al., 2013).

### **Contraceptive Recommendations**

The use of contraception allows women to space and limit pregnancies, decrease abortions, and decrease risks of endometrial and ovarian cancer (American Public Health Association [APHA], 2015; ACOG, 2016). Long-acting reversible contraceptives (LARCs) are considered the most effective method to prevent unintended pregnancies (HHS, 2018). The CDC, along with the World Health Organization (WHO), recommend LARC methods as a first-line option and assert that LARCs are appropriate for most women (CDC, 2016; WHO, 2016). The American Congress of Obstetricians and Gynecologists (ACOG) recommends the LARC methods as the most effective option for parous and nulliparous women (2015). The American Academy of Pediatrics (AAP) released recommendations in 2014 for LARCs as a first-line option for adolescents choosing not to be abstinent; the agency reports LARC methods have demonstrated safety and efficacy in adolescents over the past decade (2014).

The CDC has endorsed and adapted the WHO's contraceptive flow chart to be utilized in family planning counseling. The flow chart, considered the tiered-effectiveness approach, provides a visualization of contraceptive options ranging from most effective to least effective (WHO, 2016). The American Academy of Family Physicians (AAFP) recommends contraceptive counseling in a tiered approach with most effective or LARCs presented first (2015).

### **Significance of Proposed Project**

Effective family planning has the power to decrease maternal mortality, reduce infant mortality, slow population growth, increase socioeconomic status, and empower women (APHA,

2015; WHO, 2016). Utilization of long-acting reversible contraceptives (LARCs) has the potential to improve the health of our country while decreasing health care costs. In 2010, the United States expenditures on unintended pregnancies totaled 21 billion dollars. This included the costs of the births, abortions, and miscarriages resulting from unintended pregnancies (Sonfield & Kost, 2015). Cost analysis studies have determined cost benefits exist when utilizing highly effective contraceptive methods, specifically LARCs (Shoupe, 2016).

LARCs, specifically IUDs, are one of the most popular methods throughout the world but are underutilized in the United States (Stoddard, McNicholas, & Peipert, 2011). LARC use among American women ages 15 to 44 is estimated to be between 6 and 8 percent (HHS, 2015; Eeckhaut, Sweeney, & Gipson, 2014). In European countries, including Austria, France, Bulgaria, and Georgia, statistics differ greatly with much higher utilization of IUDs ranging from 17.6 to 25.0 percent (Eeckhaut et al., 2014). The slow uptake of LARC methods within the United States is multifaceted. Provider education, knowledge, training, cost, and patient interest are all factors leading to low utilization among American women (Shoupe, 2016). The United States healthcare system has slowly shifted the focus to preventative medicine. Family practice providers have become pivotal in providing women's preventative care and contraception education (Harper et al., 2012). Education to healthcare providers, patients, and society is fundamental to overcoming the negative aspects and increasing knowledge associated with LARC methods.

### **Project Purpose and Objectives**

Unplanned pregnancies have individual, familial, and societal consequences and continue to occur in over two million women each year (GI, 2016). Long-acting reversible contraceptives (LARCs) are highly effective methods yet underutilized within the United States. LARCs are



considered a safe, non-user dependent form of contraception (Strasser et al., 2016). The literature review revealed a gap in knowledge among healthcare providers regarding their contraceptive counseling methods, available LARC methods, and medical eligibility criteria for LARC methods. This practice improvement project aimed to understand the current knowledge and beliefs of healthcare providers as well as design an educational session to provide information about evidence-based contraceptive counseling and hands-on LARC insertion training.

### **Objectives**

The purpose of this practice improvement project was to understand and improve nurse practitioners' knowledge and awareness about long-acting reversible contraceptives (LARCs).

The purpose of this project was met through the following objectives:

1. Recognize current provider practices, knowledge, and beliefs on LARC utilization.
2. Identify knowledge gaps and barriers existing to LARC utilization by comparing the needs assessment responses to CDC's medical eligibility criteria for contraceptive care.
3. Design an educational, pre-conference session for the pharmacology conference hosted by the North Dakota Nurse Practitioner Association to disseminate findings and provide hands-on training by a qualified representative.
4. Evaluate the impact of the pre-conference session by assessing provider intention to implement LARCs into practice.

## **CHAPTER TWO. LITERATURE REVIEW**

### **Long-Acting Reversible Contraceptives**

Long-acting reversible contraceptives (LARCs) first emerged in the 1960s in the form of an intrauterine device (IUD) (Shoupe, 2016). The first-generation IUDs were non-hormonal and composed of plastic and copper. IUDs were initially a popular option for contraception in the 1970s but declined rapidly following associated health concerns (Strasser, Borkowski, Couillard, Allina, & Wood, 2016). Pelvic inflammatory disease (PID), septic miscarriages, IUD expulsion, and removal difficulty were a few complications associated with first-generation IUDs (Shoupe, 2016). Norplant was the first subcutaneous hormonal implant available within the country in 1991. Many women experienced incorrect placement, insertion site infections, and side effects following insertion. Norplant was removed from the market in 2002 (Strasser et al., 2016).

The first-generation IUDs and initial implant history have had profound effect on uptake within the United States (Strasser et al., 2016). Healthcare providers and patients current perception of risks may be shaped the initial LARC options and complications. New regulations and products have emerged over the past 50 years to ensure safety and efficacy in LARC methods. The United States Food and Drug Administration (FDA) had minimal authority over medical devices when the first IUD emerged in 1968. Currently, the FDA has the ability to require pre-market reviews and ban devices if needed (Strasser et al., 2016).

#### **Method Types**

Two types of LARC methods exist: intrauterine devices (IUDs) and subcutaneous hormonal implants. IUDs can be further classified as non-hormonal or hormone-releasing IUDs. The Paragard is the only non-hormonal IUD available within the United States and is approved for use up to 10 years (Strasser et al., 2016). The newest research indicates the Paragard may be

effective up to 12 years (United Nations Development Programme, 1997). Four types of hormone-releasing IUDs are currently available within the United States: Mirena, Skyla, Liletta, and Kyleena (Strasser et al., 2016; Bayer, 2017). The Mirena IUD became available in 2001 and is considered effective for five years. The Skyla and Liletta IUDs became available within the United States in 2013 and 2015 respectively; the Skyla is considered effective for three years and Liletta effective for four years (Strasser et al., 2016; Stoddard et al., 2011). Kyleena is the newest IUD becoming available in 2016 and is considered effective for five years (Bayer, 2017). Nexplanon is the only subcutaneous hormonal implant available within the United States and is approved effective for three years. The Nexplanon has been available since 2011 when it replaced the Implanon. The functionality of the Nexplanon is very similar to the Implanon but is able to be viewed on x-ray (Strasser et al., 2016).

### **Mechanism of Action**

The non-hormonal IUD or Paragard is a T-shaped IUD containing copper. A monofilament thread is present on the tail of the IUD to aid in detection and removal (Stoddard et al., 2011). The Paragard is 36 mm vertical by 32 mm horizontal and weighs less than one gram (Strasser et al., 2016). The mechanism of action for the non-hormonal IUD is interference with fertilization due to the copper element. The copper ions present in the non-hormonal IUD can cause sperm death and decreased motility as well as increase cervical mucous (Stoddard et al., 2011; Strasser et al., 2016).

The hormone-releasing IUDs, Mirena, Skyla, Liletta, and Kyleena, have similar mechanism of actions but differ in size and hormone concentration. All hormone-releasing IUDs are T-shaped plastic frames. Mirena and Liletta are similar in size and measure 32 mm vertical by 32 mm horizontal. Likewise, Skyla and Kyleena are similar in size and measure 30 mm

vertical by 28 mm horizontal (Strasser et al., 2016; Bayer, 2017). All hormone-releasing IUDs contain a levonorgestrel reservoir which releases the drug at a consistent rate through a permeable membrane (Strasser et al., 2016). Levonorgestrel is thought to thicken cervical mucus which prevents sperm from entering the uterus (ACOG, 2016). The endometrial lining also becomes atrophied resulting in less likelihood of a fertilized egg to attach to the uterine wall (ACOG, 2016; Stoddard et al., 2011). Mirena has the highest daily hormone release at 20 mcg followed by Liletta at 18.6 mcg, Kyleena 17.5 mcg, and Skyla at 14 mcg (Strasser et al., 2016; Bayer, 2017). Both non-hormonal and hormone-releasing IUDs must be inserted into the uterus and removed by a trained medical professional.

The subcutaneous hormonal implant, Nexplanon, is a single flexible rod composed of a polymer. Nexplanon measures four centimeters vertically and is two millimeters in diameter (Stoddard et al., 2011). A trained medical profession subdermally inserts the implant on the inner side of the non-dominant upper arm (Merck, 2017). Nexplanon is similar to all hormone-releasing IUD options and is progesterone-only contraceptive (Stoddard et al., 2011). Etonogestrel is the active ingredient in the hormonal implant that is released at 60 to 70 mcg daily (Strasser et al., 2016). While the hormone-releasing IUDs prevent fertilization of the egg, the subcutaneous hormonal implant primarily prevents ovulation. The implant is also thought to increase cervical mucous and keeps the endometrial lining thin (ACOG, 2016).

### **Efficacy, Safety, Side Effects and Benefits**

LARCs are the most effective, reversible contraception options available (ACOG, 2016). Less than one in 100 women will become pregnant while utilizing a LARC method; making LARC methods more effective at preventing pregnancy than permanent options of vasectomy for males or hysteroscopic sterilization for females (CDC, 2016). The combined hormonal

contraceptive pill, a popular SARC option among American women, has a much higher failure rate. With typical use of the contraceptive pill, nine out of 100 women become pregnant during the first year (CDC, 2016). Women under the age of 21 are at increased likelihood of contraceptive failure while utilizing short-acting options. The increased risk of contraception failure among adolescents is linked to lower adherence to taking a daily pill (Winner et al., 2012). The Mirena and Kyleena, which are both five year IUD options, would replace 1,826 once daily pills required by oral contraceptive users (Bayer, 2017).

Decades of research, along with new regulations, have demonstrated LARCs to be a very safe method for contraception. Adverse events associated with LARCs are rare (Strasser et al., 2016). The possible risks associated with IUD insertion includes: uterine perforation, spontaneous expulsion, and pelvic inflammatory disease (PID) (ACOG, 2016). The overall risk of uterine perforation is less than one per 1000 women and spontaneous expulsion less than 10 percent during the first year (Stoddard et al., 2011). If an existing bacterial sexually transmitted infection (STI) is present; women are at a small increased risk for PID during the first 20 days following insertion (Strasser et al., 2016; ACOG, 2015). Women at risk for chlamydial or gonococcal infections should be screened at the time of LARC insertion (CDC, 2016). Jatlaoui, Simmons, and Curtis (2016) reported evidence demonstrating no increased risk for PID in women at high risk of STIs or asymptomatic infections. Insertion of a LARC should not be delayed unless a female has purulent cervicitis or a known STI (CDC, 2016).

Side effects associated with the non-hormonal IUD include menstrual pain, increased menstrual bleeding, and spotting between periods. Menstrual pain and increased menstrual bleeding typically decrease after the first year following insertion (ACOG, 2016). Hormone-releasing IUDs have possible side effects of irregular bleeding, menstrual pain, headaches, and

nausea (ACOG, 2016). Amenorrhea, or the absence of menstruation, is common and can occur in months following insertion of hormone-releasing IUDs; this side effect can be considered an advantage or disadvantage depending on the patient population (Shoupe, 2016; Stoddard et al., 2011). Amenorrhea may cause concern or stress in sexually-active adolescents and women who correlate amenorrhea as the first sign of pregnancy. The hormonal implant has potential side effects of unscheduled bleeding, headaches, mood changes, acne, and weight gain (ACOG, 2016). Many of the potential side effects are not exclusive to LARC methods but also occur in SARC methods including oral contraceptives (CDC, 2016; ACOG, 2016).

Women quickly return to fertility following removal of each LARC method (Strasser et al., 2016). Beyond the reversibility and efficacy features, noncontraceptive benefits have been associated with LARC use. The hormone-releasing IUD has a recognized benefit in decreasing blood loss during menstruation. The Food and Drug Administration (FDA) approved the hormone-releasing IUDs for treatment of menorrhagia in 2009 (Yoost, 2014). Additional noncontraceptive benefits associated with IUD use include improved anemia, improved dysmenorrhea, and endometrial protection against hyperplasia (Yoost, 2014). The hormonal implant may have noncontraceptive benefits, as well. Women have reported reduction in acne, improvement in dysmenorrhea, and decreases in symptoms associated with endometriosis (Stoddard et al., 2011).

### **Barriers to Long-Acting Reversible Contraception Use**

Within the United States LARC use remains relatively low compared to other developed countries across the world (United Nations, 2013). LARC utilization among American women ages 15 to 44 was approximately 7.2 percent (HHS, 2015). Approximately 14 percent women worldwide are estimated to be using LARC methods (Strasser et al., 2016). European countries,

including Austria, France, Bulgaria, and Georgia, have much higher utilization of IUDs ranging from 17.6 to 25.0 percent (Eeckhaut et al., 2014).

Unintended pregnancies are a public health concern leading to billions of dollars in medical costs and over one million abortions annually (Trussell et al., 2013). Increased utilization of LARCs has the potential to decrease medical costs and abortions nationwide (Peipert, Madden, Allsworth, & Secura, 2012; Trussell et al., 2013). The low prevalence of LARC use in the United States is multifactorial with provider knowledge and skill level playing a crucial role in the utilization of LARCs (Strasser et al., 2016). Patient perspectives, misperceptions, and financial barriers also contribute to the low uptake and utilization among American woman (Strasser et al., 2016; Yoost, 2014).

### **Provider Knowledge**

Research has indicated that provider interest, beliefs, knowledge, and training pose a significant barrier to LARC utilization (Shoupe, 2016). Strasser et al. (2016) reported women have increased access to LARC methods when providers are knowledgeable about methods, provide comprehensive counseling, are trained on insertion, and provide same day service. Providers in the obstetrics and gynecology area are major sources of family planning and reproductive healthcare services. Healthcare reform within the United States is shifting the focus of our healthcare system to preventative medicine. A new emphasis is being placed on primary care, as front-line providers, to deliver comprehensive family planning services (Wood et al., 2018).

In 2014, the CDC released clinical guidelines to providing quality family planning services. Tiered-effectiveness counseling is the recommended method of contraceptive counseling (Gavin et al., 2014). Tiered-effectiveness counseling consists of providing education

about the most effective forms of contraception before discussing less effective methods. The CDC and WHO recommend incorporation of the contraceptive flow chart to be utilized in all contraceptive counseling (Figure 1). Research has demonstrated family practice providers are providing LARC education at lower rates than providers in obstetrics and gynecology. Harper and associates (2012) reported only 47 percent of family medicine providers routinely discuss IUDs with patients while 95 percent of women are receptive to learning about IUD options.

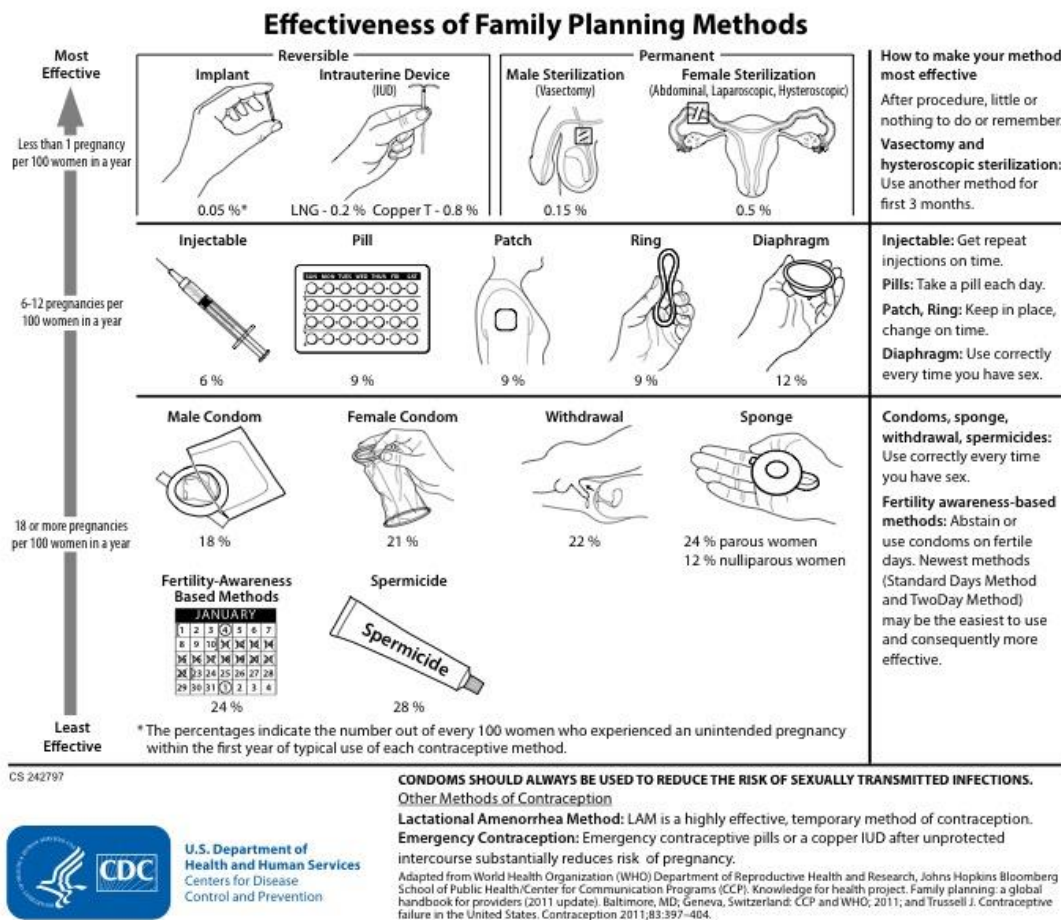


Figure 1. Effectiveness of Family Planning Methods. Reprinted from ‘Center for Disease Control and Prevention,’ by U.S. Department of Health and Human Services, n.d., Retrieved from <https://www.cdc.gov>.

Eligibility criteria for contraceptive use has changed over the past decade. Most women and adolescents are eligible for LARC methods. Harper and associates (2012) conducted a



national survey to approximately 1200 family medicine and obstetrics-gynecology physicians to measure the counseling and practices of intrauterine contraception. Researchers determined most family practice physicians did not have adequate knowledge on LARC eligibility. Less than half of family medicine physicians would consider hormone-releasing IUDs for patients with diabetes, obesity, history of PID, or smoking. This study points to a knowledge deficit in family medicine physicians and the increased need for education and hands-on training (Harper et al., 2012). Harper and associates (2013) later performed the same survey to nurse practitioners across the United States. Primary care nurse practitioners had lower knowledge of patient eligibility and higher perception of risks with IUD utilization compared to women's health nurse practitioners (Harper et al., 2013).

Medical eligibility criteria (MEC), specific to contraceptive use, has been developed by the CDC, including MEC charts and wheels to utilize in daily practice (Curtis et al., 2016). Women with a past or current deep vein thrombosis (DVT), pulmonary embolism, diabetes, human immunodeficiency virus (HIV), hypertension, multiple sclerosis, past pelvic inflammatory disease, stroke, or systemic lupus are eligible for LARC methods. Women with a current or past history of breast cancer are still eligible for the Paragard due to the nonhormonal function (CDC, 2016). Many healthcare providers continue to erroneously consider adolescents and nulliparous women ineligible for IUDs. Harper and associates (2013) found only 29 percent of nurse practitioners in primary care and 51 percent of nurse practitioners in women's health considered teenagers eligible for an IUD (Harper et al., 2013). Evidence has demonstrated IUDs are highly effective and safe in adolescents and nulliparous women, and current recommendations from the CDC and WHO include utilization of LARCs as first-line options for most females including adolescents who are sexually active (ACOG, 2012).

Provider training and skill level are additional provider-linked barriers to LARC utilization. Inserting and removing LARCs requires additional training and skill not required with utilization of SARC options. Online insertion and removal videos, as well as in-person demonstrations, can be requested through Liletta, Mirena, Kyleena, Nexplanon, Paragard, and Skyla (ACOG, 2016). Providers who receive formal training and do not regularly perform insertions report decreased confidence in skill (Garrett, Keogh, Kavanagh, Tomnay, & Hocking, 2015). Recruiting and training a mentor within each clinic may assist with uptake and motivation of fellow healthcare providers. (Shelton & Burke, 2016).

### **Myths and Misconceptions**

Lack of information, myths, and exaggerated complications have contributed to low LARC uptake within the United States (Strasser et al., 2016). Social norms play a significant role in contraceptive choices for women. Women often report utilizing oral contraceptives most often due to popularity among their friends (Garrett et al., 2015). Russo, Miller, and Gold (2013) report common misconceptions about LARCS, including IUDs causing abortions, PID, and infertility. The complications arising following use of first-generations IUDs in the 1970s has led to exaggerated safety concerns with modern-day IUDs among providers and users (Yoost, 2014). Modern nonhormonal IUDs, hormone-releasing IUDs, and subcutaneous hormonal implants are considered safe and highly-effective and should be utilized as a first-line contraceptive methods for all women (Strasser et al., 2016). Healthcare providers play an important role in providing contraceptive counseling, resolving myths and exaggerated complications.

### **Economic Considerations**

Cost is a considerable factor leading to low uptake of LARC methods within the United States. Affordability is commonly cited as a consideration toward using contraception (APHA,

2015). LARCs come with a high upfront cost. Wholesale costs associated with various LARC methods include: \$844 for the Mirena IUD, \$718 for the Paragard IUD, and \$791 for the Nexplanon IUD (Trussell, 2012). The wholesale prices do not include costs associated with the office visits and insertion. The average total cost to initiate a LARC method is approximately \$1000 wholesale (Eisenberg, McNicholas, Peipert, 2013). Despite initial costs associated with LARC placement, researchers have determined a cost-effectiveness in women who switch from oral contraceptives to a LARC option and utilize the method greater than one year (Trussell et al., 2013)

The federal government in the United States is currently a facilitator and barrier towards universal access to contraception. In 2012, the Affordable Care Act (ACA) improved access to contraception by making a full range of contraceptive measures affordable (Kaiser Family Foundation [KFF], 2017). All private health insurances were required to provide full coverage to the full range of contraceptives and services with few exemptions (KFF, 2017; Strasser et al., 2016). Further provisions were enacted following the initial release of the ACA to allow grandfathered plans to not comply with the requirements, thus allowing limited or no coverage for contraceptive measures. In October of 2017, the Trump Administration enacted new regulations which further expanded the employers who have the ability to be exempt from contraceptive coverage requirements. The lack of contraceptive coverage in Americans' private insurance plans will continue to decrease the ability to obtain the most effective contraceptive options (Sobel, Salganicoff, & Rosenzweig, 2017).

Individual state governments have also contributed to facilitating the universal access of contraception. Following the enactment of the ACA, many state governments initiated Medicaid expansion programs. Eighty-eight percent of Medicaid expansion programs cover all prescription

contraceptive methods, including LARCs and emergency contraception (KFF, 2016). Programs and facilities are available to women who lack insurance coverage, contraceptive coverage, or ability to pay out-of-pocket expenses associated with LARC insertion. Publicly funded family planning clinics often include public health departments, federally qualified health centers, and Planned Parenthood (Zolna & Frost, 2016). Most publicly funded family planning clinics receive Title X funding, which provides family planning services for low-income men and women (Strasser et al., 2016; Zolna & Frost, 2016). Publicly funded family planning clinics are often able to provide services on a sliding scale based on income and household size.

The Contraceptive CHOICE Project (CHOICE) was an observational cohort study with the goal to promote LARCs and reduce unintended pregnancies in St. Louis, Missouri (Birgisson, Zhao, Secura, Madden, & Peipert, 2015). Healthcare providers at the clinic provided comprehensive and unbiased counseling. The financial barrier to LARC options was eliminated during the project. Women overwhelmingly selected the LARC options compared to the short-acting options when cost was not a factor. The continuation rate for women utilizing LARC methods was 87 percent at one year compared to 57 percent using non-LARC options (Birgisson, Zhao, Secura, Madden, & Peipert, 2015).

The Colorado Family Planning Initiative (CFPI) was started in 2008 in an effort to provide low- to no-cost LARCs (Colorado Department of Public Health and Environment, 2017). The program is ongoing; an estimated 36,000 women received a LARC method by 2015. As a result of the program, the teen birth and abortion rates were decreased by 50 percent. Substantial economic impacts occurred including 52.3 to 53.7 million dollars in Medicaid costs avoided by 2015 (Colorado Department of Public Health and Environment, 2017).

## **Improving Uptake**

Research has demonstrated knowledge gaps regarding contraceptive effectiveness existing with women overestimating the effectiveness of oral contraceptive pills, patches, rings, and condoms (Eisenberg et al., 2012). Contraceptive counseling by primary care providers should include utilization of tiered-effectiveness tools with the most effective options, LARCs, discussed first (Hathaway et al., 2014). The Contraceptive CHOICE Project in St. Louis indicated women continue the use of LARC methods at a higher rate than SARC methods (Birgisson et al., 2015). Presenting detailed discussions about the benefits and side effects of each contraceptive option may ensure satisfaction and continuation of selected LARC method (Hathaway et al., 2014).

Improving LARC uptake in a primary care setting requires a further understanding of the providers' knowledge, awareness, and beliefs of LARC methods. Each region of the United States possesses a unique set of healthcare providers and experiences different challenges related to LARC utilization. This makes obtaining data specific to healthcare providers in Minnesota and North Dakota integral to determining the unique knowledge, awareness, and beliefs of our region. The knowledge gaps and barriers were identified when data was compared to the CDC's medical eligibility criteria (MEC) for contraceptive care. An educational training session was designed to disseminate findings and provide hands-on training by a qualified representative.

## **Theoretical Framework**

Evidence-based practice allows the highest quality health care to be delivered with the best patient outcomes (Melnyk & Fineout-Overholt, 2015). Successful implementation of an evidence-based practice requires application of a theory or conceptual model. The Diffusion of

Innovations Theory assisted with the development, implementation, and evaluation of the practice improvement project.

### **Diffusion of Innovations Theory**

Diffusion of Innovations is a theory developed by Everett Rogers examining the spread of new innovations and applicable to women's contraceptive choices. Rogers described diffusion as the means of communicating innovation through channels among members of a social system (Rogers, 2003). Four main elements build the Diffusion of Innovations: the innovation, the communication channel, the time, and a social system. An innovation can take many forms, such as an idea or practice. Attributes of innovation consist of relative advantage, compatibility, complexity, trialability, and observability. Relative advantage can be measured in economic terms, social factors, or satisfaction and is considered the perceived degree to which the innovation is better than other ideas (Rogers, 2003). Compatibility is determined by how the innovation aligns with a person's preexisting values or past experiences. Complexity refers to how understood the innovation is among a group of people (Rogers, 2003). Trialability entails the amount you are able to trial an innovation and observability is determined by how visible the innovation is to others (Rogers, 2003). Rogers (2003) discusses that often innovations with less complexity and greater relative advantage, compatibility, trialability, and observability will be adopted more quickly.

Many communication channels exist to share information, ideas, or practices. Rogers (2003) differentiates communication channels into mass media and interpersonal. Mass media channels are often able to inform a large audience in an efficient manner. Social media has evolved over the past decade and is considered a form of a mass media channel. Interpersonal channels refer to face-to-face communication. Time is the third element in the theory and refers

to the time a person first obtains knowledge until the time a person adopts or rejects the innovation (Rogers, 2003). The innovation-decision process consists of five steps: knowledge, persuasion, decision, implementation, and confirmation. The time process associated with the innovation-decision process varies from person to person (Rogers, 2003). A visual depiction of the Innovation-Decision process is available in Figure 2. Furthermore, a person or adopter can be classified into five categories developed by Rogers: innovators, early adopters, early majority, late majority, and laggards (2003). The final element of Diffusion of Innovations is a social system, which is the individuals, groups, or subsystems attempting to accomplish a common goal (Rogers, 2003). The social and communication structure within each social system plays a role in diffusion. Rogers (2003) discusses that contraceptive methods vary greatly between two villages who received the same promotion and family planning programs due to the individual innovativeness within each village or system.

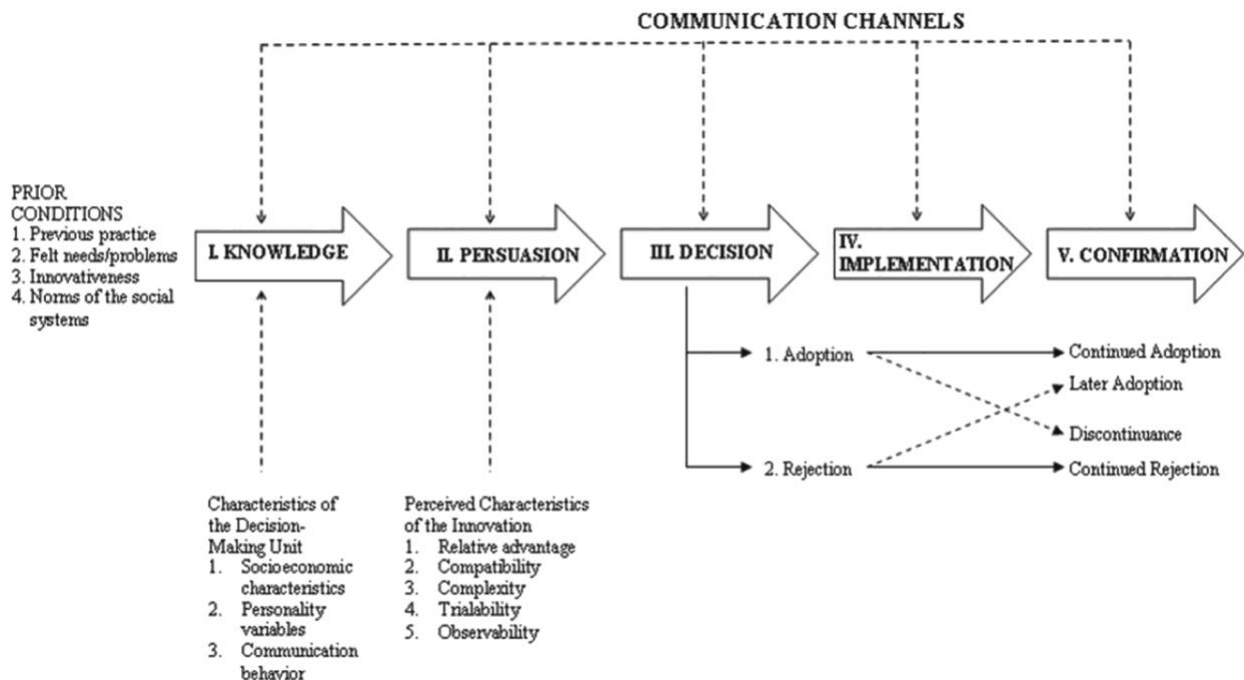


Figure 2. Innovation-Decision Process (Rogers, 2003)

The process of innovation diffusion is applicable to women's contraceptive choices, specifically LARCs, and understanding why potential users adopt or reject LARC methods despite LARCs being recommended as first-line by experts and guideline producers (Murphy, Burke, & Haider, 2017). Passive and active diffusion may occur. Passive diffusion being the unplanned spread of innovation and active diffusion being the planned, formal spread of innovation (Murphy et al., 2017). Contraceptive counseling by a healthcare provider would be considered active diffusion. If a female discusses LARC methods with her college roommate, passive diffusion occurs.

The attributes of relative advantage, compatibility, complexity, trialability, and observability can be applied to the innovation of LARCs. In regard to relative advantage, LARC methods have been determined highly effective and more effective than oral contraceptives, contraceptive patches, vaginal rings, and injectables (Trussell, 2011). Convenience is a relative advantage for LARC methods as they do not require daily, weekly, or monthly adherence needed for SARC methods. The economic component may be considered a relative advantage or disadvantage for LARC methods. High up-front costs are associated with LARC methods. The ACA as well as Title X funding has helped millions of American women receive low to no cost family planning services, including LARC methods. Trussell et al. (2013) determine LARC methods are more cost-effective than oral contraceptives when utilized for over a year. Compatibility is the degree in which the innovation or LARCs are consistent with a person's values and past experiences (Rogers, 2003). The compatibility attribute will require education from a healthcare provider as many myths and misconceptions are associated with LARC methods primarily due to first-generation IUDs (Russo et al., 2013; Yoost, 2014). Comprehensive and evidence-based contraceptive education may increase the compatibility



attribute and assist with the rate of adoption. The complexity of LARC utilization is different for providers versus patients. Provider skill and training is required for subcutaneous implant and IUD insertion. Low complexity is required for patients utilizing LARCs as they require minimal upkeep and adherence. Trialability and observability may both be positive attributes. LARCs can be trialed on a limited basis and discontinued by a provider if requested (Murphy et al., 2017). Many women may prefer contraceptive measures be invisible versus observable; LARC methods are not visible once inserted (ACOG, 2016).

Healthcare providers are one of the primary communication channels in the diffusion of LARCs. In order to increase the uptake of LARC methods, healthcare providers should possess the most up to date information regarding all contraceptive options including eligibility, cost, benefits, and side effects. Healthcare providers delivering evidence-based contraceptive counseling will provide active diffusion which may lead to passive diffusion. Murphy et al. (2017) reported participants stated information received from their healthcare provider was more influential than peers. Diffusion of Innovations by Everett Rogers (2003) provides a guide for intervention by involving all attributes building an innovation, or LARC methods, as well as addressing the diffusion through a proper communication channel, time, and social system.

## **CHAPTER THREE. PROJECT DESCRIPTION**

### **Project Design**

The project consisted of two components: 1) collection and analysis of an electronic questionnaire about LARCs to healthcare providers and 2) design and implementation of an educational hands-on LARC training session. The LARC needs assessment questionnaire was sent to health care providers throughout Minnesota and North Dakota to assess the provider's knowledge, training, beliefs, and interests related to LARC utilization. The information collected in the questionnaire incorporated the provider's preferred method of contraceptive counseling, perceived barriers to LARC uptake, and concerns related to utilization. The purpose of the questionnaire was to determine the knowledge gaps and barriers existing to LARC utilization for healthcare providers as well as to guide the content development for the educational hands-on LARC training session.

A variety of platforms were utilized to recruit participants for the electronic LARC questionnaire. Facebook, electronic newsletters, and email listservs were all used for dissemination. The North Dakota Nurse Practitioner Association advertised the questionnaire via their Facebook and electronic newsletter. The Minnesota Board of Nursing's email listserv was an additional avenue utilized for dissemination. All answers remained anonymous. An incentive was offered for completion. Participants were entered into a drawing for one of two, 100 dollar gift cards following completion of the questionnaire. The participants' contact information was not linked to questionnaire data.

A pre-conference educational training session was designed and hosted at the North Dakota Nurse Practitioner Association Pharmacology Conference. Previous and current nurse practitioner preceptors, graduate school faculty, and family nurse practitioner students were

invited to the educational training session. The session was first offered to rural nurse practitioner preceptors of the university with a goal of addressing the shortage of trained LARC providers in rural areas. Due to the low response from this cohort, email invitation was extended to urban nurse practitioners and DNP program faculty. Nurse practitioner students were also invited to join the training session. Education was provided on current unintended pregnancy statistics, evidence-based contraceptive counseling, and the results determined by the LARC needs assessment questionnaire. Following the presentation, a qualified representative provided a hands-on training for the subcutaneous hormonal implant, Nexplanon. At the completion of the educational training session, participants were asked to complete a post-training questionnaire to evaluate the intervention.

Prior to providing knowledge, a thorough understanding must be gained of a providers' prior practices, knowledge, and beliefs. The collection and analysis of the LARC needs assessment questionnaire assisted with the first stage of Rogers' Innovation-Decision process, knowledge. During the knowledge stage of Roger's model, the focus is on awareness, how-to-knowledge, and principals of the innovation (Rogers, 2003). The persuasion stage requires examination of relative advantage, compatibility, complexity, trialability, and observability of an innovation. Each component was addressed during the educational training session. The aforementioned components assisted with moving through Roger's knowledge and persuasion stages. During the decision stage, participants may choose to adopt or reject the innovation. Participants were asked to complete a post-training questionnaire following the educational training session to assess their planned change or Roger's decision stage. A visualization of the project interventions integrated within the Innovation-Decision Process is available in Figure 3.

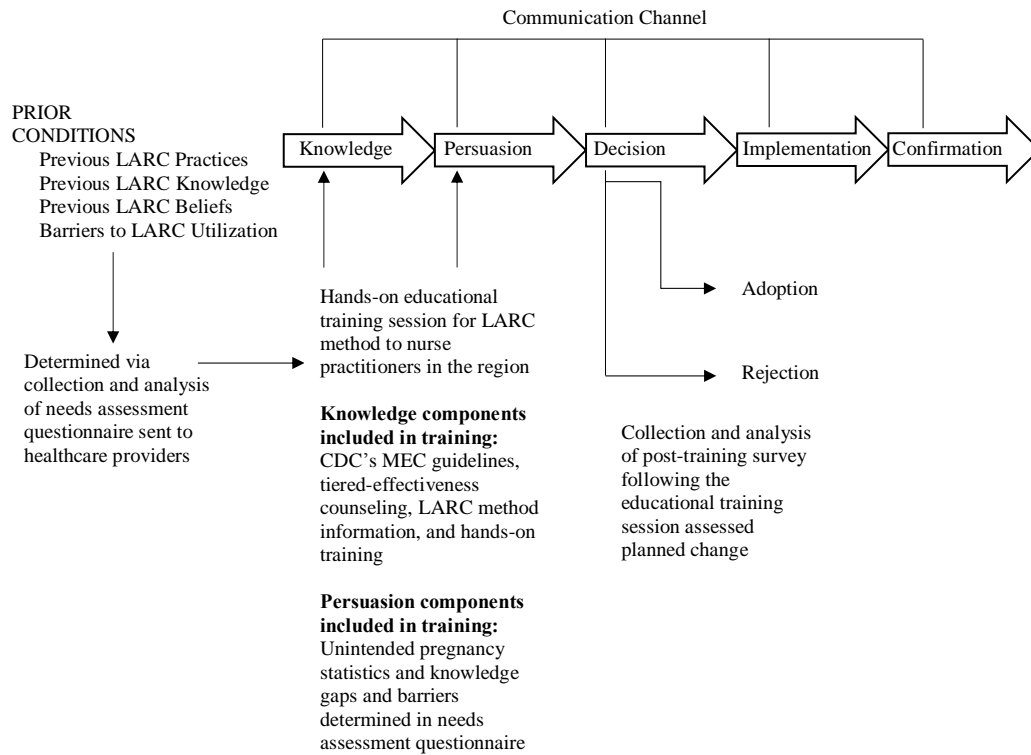


Figure 3. Project Interventions Integrated into Innovation-Decision Process

### Logic Model

Logic models are a tool used to guide program development and evaluation (CDC, 2007). Logic models assist with design, planning, implementation, and evaluation of the practice improvement project. A logic model provides a visualization of the relationship between the process and outcome components (CDC, 2007). The process component, also considered planning elements, can be further divided into inputs, activities, and outputs. The outcome component refers to the planned effects. The logic model developed to guide the practice improvement project is displayed in Figure 4.

Outcomes are the changes in knowledge, attitude, or skill resulting from the program and can be further classified as short-term, intermediate, and long-term outcomes (W.K. Kellogg, 2004). Short-term outcomes of the project included gaining a comprehensive understanding of

healthcare provider LARC knowledge, increasing provider knowledge and awareness about LARCs, and providing training opportunity for healthcare providers. Intermediate outcomes of the project were increasing provider counseling for LARC placement and increasing the number of LARCs placed. The long-term outcomes or impacts of the Logic Model are the community or system-level change resulting from program development (W.K. Kellogg, 2004). In terms of the project, long-term outcomes were reducing unplanned pregnancies, increasing population acceptance of LARCs, decreasing infant and maternal morbidity and mortality rates, decreasing healthcare costs, and empowering females across the United States.

INPUTS	OUTPUTS		OUTCOMES		
	Activities	Participation	Short Term	Medium Term	Long Term
People: -Graduate student -Committee chair -Committee members -Pharmaceutical Representative -Providers across MN and ND  Time -Planning process  Technology: -Questionnaire creation and dissemination  Incentive prizes	Electronic questionnaire completion  Pre-conference training session  Analysis and interpretation of electronic questionnaire  Analysis and interpretation of training session questionnaire	Healthcare Providers throughout ND and MN: -Physicians -Nurse Practitioners -Physician Assistants  Doctor of Nursing Practice Students  Merck & Co. Representative	Gaining a comprehensive understanding of healthcare provider LARC knowledge  Increasing provider knowledge and awareness about LARCs  Providing training opportunity for healthcare providers	Increasing provider counseling for LARC placement  Increasing the number of LARCs placed	Reducing unplanned pregnancies  Increasing population acceptance of LARCs  Decreasing infant and maternal morbidity and mortality rates  Decreasing healthcare costs  Empowering females across the United States

Figure 4. Logic Model

### Institutional Review Board

The practice improvement project was conducted in accordance with the regulations and policies of the North Dakota State University Institutional Review Board (IRB) The project approval was granted on March 19<sup>th</sup>, 2018 (Appendix D). In accordance with federal regulations, the questionnaire of healthcare providers was considered exempt under category 2b.

## **CHAPTER FOUR. EVALUATION**

### **Evaluation**

Participants were asked to complete an electronic questionnaire, consisting of demographic information and questions regarding knowledge, beliefs, and utilization of LARCs in their practice. The questionnaire is an instrument utilized in 2015 by the Vermont Child Health Improvement Program (VCHIP) at the University of Vermont and Vermont Department of Health. The questionnaire consisted of 34 multiple choice questions (Appendix A). Permission has been attained by Adrienne Woike, the project contact, to partially-adopt and utilize the instrument (Appendix B). The instrument was previously utilized to identify gaps between evidence-based guidelines and provider knowledge and their practices in the state of Vermont (VCHIP, 2015). Three additional questions were asked to participants who wish to receive further information, training, or results from the assessment. If the participant wished to receive further information, their name, mailing address, and email address was requested. The participants' information was not linked to previous questionnaire answers.

Questionnaire data were collected from March 28<sup>th</sup>, 2018 to July 5<sup>th</sup>, 2018. The questionnaire was administered via Qualtrics and estimated to take approximately 10 minutes from beginning to end. Collection and analysis of the LARC needs assessment questionnaire assisted with designing an educational training session for nurse practitioners across our region. The knowledge gaps and barriers to LARC utilization determined by the questionnaire were incorporated into the content discussed by the presenter at the training session.

An evaluation was also performed following the educational training session. The questionnaire was compiled with two questions assessing the provider's use of tiered-effectiveness contraceptive counseling in their practice and an assessment of whether the

provider inserted LARCs prior to the training. The remaining two questions assessed the provider’s plan to utilize tiered-effectiveness contraceptive counseling and plan to insert LARCs following the training (Appendix C). A summary of the objectives with the corresponding evaluation method is available in Figure 5.

Objective	Evaluation
1. Recognize current provider practices, knowledge, and beliefs on LARC utilization.	Measured via participation and responses of needs assessment questionnaire
2. Identify knowledge gaps and barriers existing to LARC utilization by comparing the needs assessment responses to CDC’s medical eligibility criteria (MEC) for contraceptive care.	Measured by analysis of questionnaire and comparing responses to the CDC’s MEC
3. Design an educational, pre-conference session for the pharmacology conference hosted by the North Dakota Nurse Practitioner Association to disseminate findings and provide hands-on training by a qualified representative.	Completion of pre-conference, hands-on training session
4. Evaluate the impact of the pre-conference session by assessing provider intention to implement LARCs into practice.	Measured by analysis of post-training questionnaire and participants planned change

*Figure 5. Objectives and Evaluation Method*

**Objective One**

The first objective was to recognize current provider practices, knowledge, and beliefs on LARC utilization. The VCHIP (2015) instrument was utilized to gain an understanding of current practices, knowledge, and beliefs of health care providers in North Dakota and Minnesota. Questions addressed previous training in LARC counseling and insertion, knowledge of individual LARC methods, comfort level in providing LARC counseling, and understanding of current LARC medical eligibility criteria. Rogers (2003) discusses the importance of obtaining the prior conditions, such as previous practices and innovativeness, before opening the communication channel. A comprehensive understanding of current knowledge and practices was collected and provided the framework for Roger’s Innovation-Decision process.

## **Objective Two**

The second objective, identify knowledge gaps and barriers existing to LARC utilization by comparing the questionnaire responses to CDC medical eligibility criteria (MEC) for contraceptive care, was evaluated through interpretation of the LARC needs assessment questionnaire. A comparison was made between the assessment responses and current evidence-based recommendations by the CDC. Specifically, questions 16, 20, 31, 32, and 33 were analyzed and compared to recommendations within the MEC guidelines to determine knowledge gaps. Questions 21, 25, and 29 were reviewed and analyzed to determine barriers to LARC utilization. The identification of knowledge gaps and barriers led to a deeper understanding of the educational needs of healthcare providers across the region, providing groundwork for objective three.

## **Objective Three**

The third objective was to design an educational, pre-conference session for the pharmacology conference hosted by the North Dakota Nurse Practitioner Association to disseminate findings and provide hands-on training by a qualified representative. Previous and current nurse practitioner preceptors, graduate school faculty, and family nurse practitioner students were invited to the educational training session. The findings of the LARC needs assessment questionnaire assisted with designing the session and incorporating content to address the knowledge gaps and barriers of providers in the region. The session included an educational presentation discussing unintended pregnancy statistics, tiered-effectiveness contraceptive counseling, and the results of the LARC needs assessment questionnaire. Following the presentation, a qualified representative provided a hands-on training for a LARC method.



## **Objective Four**

The fourth and final objective was to evaluate the impact of the educational training session by assessing provider intention to implement LARCs into practice. Following the educational presentation and hands-on training, participants were asked to complete a post-training questionnaire. The post-training questionnaire consisted of four questions. The first two questions assessed the providers' previous use of the tiered-effectiveness contraceptive counseling and their planned adoption or rejection following the presentation. The last two questions assessed their previous insertion of LARC methods and their planned adoption or rejection following the hands-on training session. The objective was measured by comparing question one and two, to determine planned use of tiered-effectiveness contraceptive counseling, and comparing question three and four, to determine planned utilization of LARCs in their practice.

## **CHAPTER FIVE. RESULTS**

### **Presentation of Findings**

A total of 166 individuals initiated the questionnaire and 147 responses were considered eligible for analysis. Participants not consenting to begin the questionnaire, not providing direct patient care, or not practicing in the states of Minnesota or North Dakota were all excluded from participating in questionnaire in its entirety and excluded from analysis.

### **Participant Demographics**

The majority of the respondents were nurse practitioners, with 144 nurse practitioners, 2 nurse midwives, and 1 physician completing the questionnaire. Family medicine was most frequently selected as the respondent's area of practice, with 43.5% selecting family medicine as their specialty, followed by internal medicine, obstetrics/gynecology, and pediatrics all at 12.9%. Most respondents had been practicing for greater than 5 years with over 80% of respondents reporting 6-10, 11-15, 16-20, or 21 or more years of practice. The majority of participants reported working in a community hospital/clinic or private clinic/multispecialty clinic at 41.5% and 21.1% respectively (see Table 1).

Table 1

*Demographic of Participants*

<b>Demographics</b>	<b>(n)</b>	<b>(%)</b>
<b>Professional Qualification</b>		
Physician	1	0.7
Nurse Midwife	2	1.3
Nurse Practitioner	144	98.0
<b>Specialty</b>		
OB/GYN	19	12.9
Internal Medicine	19	12.9
Family Medicine	64	43.5
Pediatrics	19	12.9
Midwifery	1	0.7
Other	25	17.0
<b>Years in Practice</b>		
0-5	29	19.7
6-10	52	35.4
11-15	15	10.2
16-20	23	15.7
21 or more	28	19.0
<b>Main Clinical Practice Setting</b>		
Community Hospital/Clinic	61	41.5
University Medical Center/Clinic	16	10.9
Private Clinic/Multispecialty Clinic	31	21.1
Family Planning Clinic	1	0.7
Federally Qualified Health Center	4	2.7
Rural Health Center	8	5.4
University/College Health Center	10	6.8
School-Based Health Center	4	2.7
Other	12	8.2

**Participant LARC Training Response**

When asked about having previous training to provide IUD counseling, 53.7% of respondents reported yes (See Table 2). The majority of respondents who received prior training reported the training occurred at a CME or conference (39.24%) followed by in practice (26.6%)

and in school (25.3%). Fewer respondents had previously received training to provide IUD insertion with 42.1% receiving prior training. The prior training occurred in the practice setting or was arranged by employer 43.6% of the time.

Fewer respondents had previous training to provide implant counseling with 44.5%. The majority had received the implant counseling training within the last 0-5 years (58.5%). The implant counseling training occurred in practice or was arranged by employer 46.9% of the time followed by at a CME or conference 42.2% of the time. Fewer respondents had previously received training to provide implant insertion with 39.3% receiving prior training.

Table 2

*LARC Training*

<b>LARC Training</b>	<b>(n)</b>	<b>(%)</b>
<b>Received Training for IUD Counseling</b>		
Yes	79	53.7
No	68	46.3
<b>Received Training for IUD Insertion</b>		
Yes	61	42.1
No	84	57.9
<b>Received Training for Implant Counseling</b>		
Yes	65	44.5
No	81	55.5
<b>Received Training for Implant Insertion</b>		
Yes	57	39.3
No	88	60.7

**Counseling Comfort Level**

Participants were asked about their comfort level with counseling women about the various LARC methods. The results of the questionnaire demonstrated participants more comfortable discussing hormone-releasing IUDs (43.0% reporting being very comfortable) and hormonal implants (43.7% reporting being very comfortable) than the non-hormonal IUD

(33.1% reporting being very comfortable) (See Table 3). The results from question were further analyzed according to specialty (See Figure 6, 7, and 8).

Table 3

*Counseling Comfort Level*

How comfortable do you feel counseling a woman about:	Copper T IUD		Levonorgestrel-releasing IUD		Etonogestrel implant (Nexplanon)	
	(n)	(%)	(n)	(%)	(n)	(%)
Very Comfortable	45	33.1	58	43.0	59	43.7
Comfortable	46	33.8	42	31.1	34	25.2
Uncomfortable	30	22.1	22	16.3	29	21.5
Very Uncomfortable	15	11.0	13	9.6	13	9.6

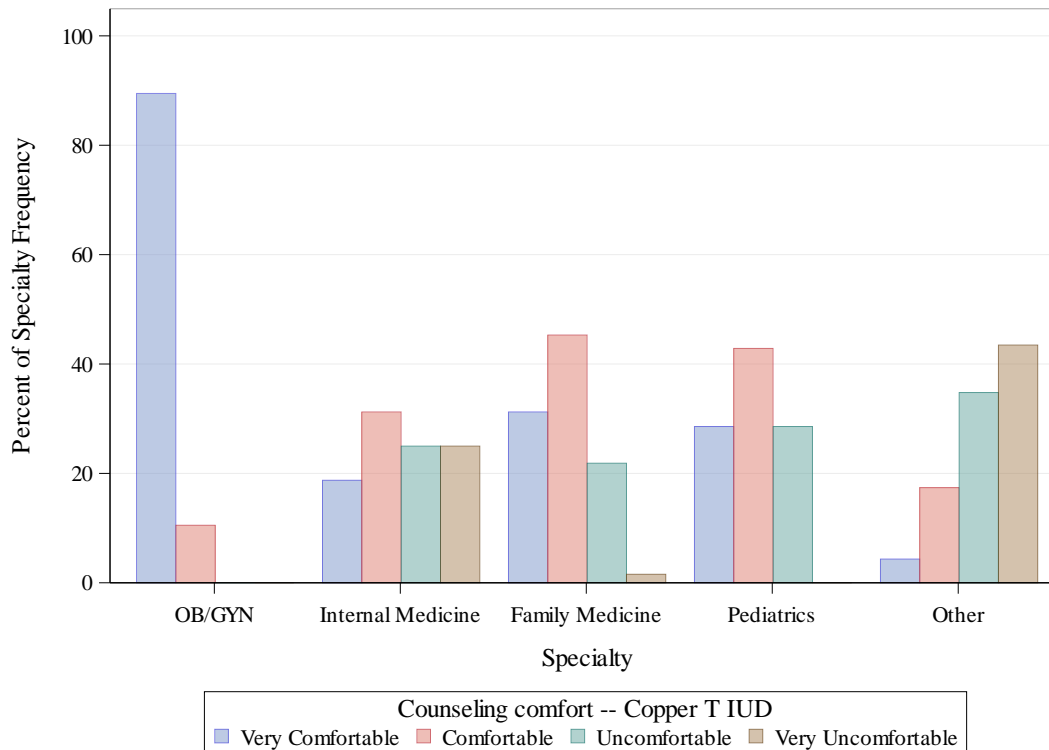


Figure 6. Counseling Comfort, Copper T IUD

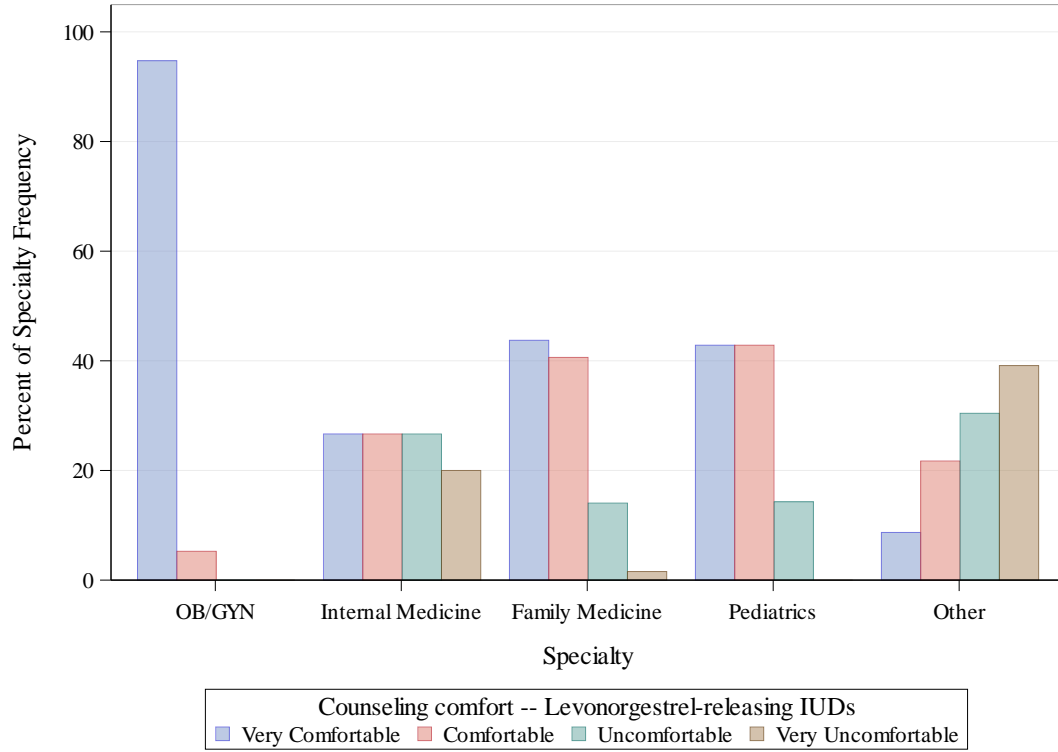


Figure 7. Counseling comfort, Levonorgestrel-releasing IUD

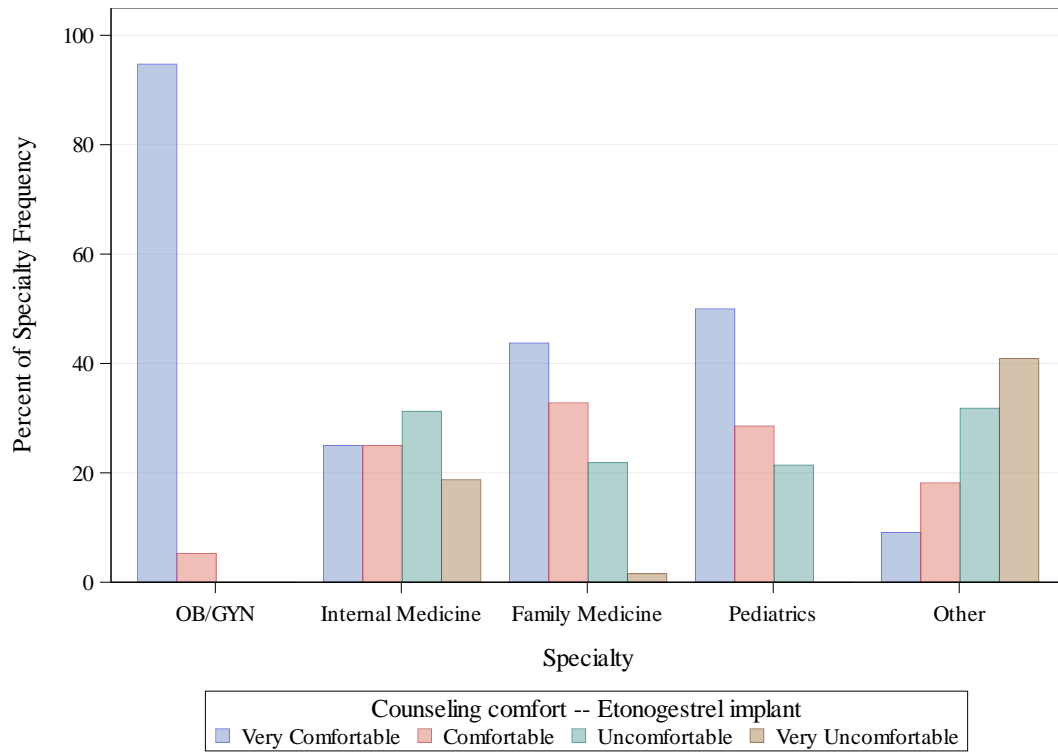


Figure 8. Counseling comfort, Etonogestrel implant

## Recommendations for Medical Conditions

Question 16 asked participants about their recommendations for the non-hormonal IUD, hormone-releasing IUD, and hormonal implant in women with a coexisting medical condition. The medical conditions included menorrhagia, dysmenorrhea, fibroids, diabetes, obesity, tobacco use, hypertension (HTN), iron-deficiency anemia (IDA), and breastfeeding immediately postpartum. According the CDC, all of the previously mentioned conditions are considered a 1, meaning there is no restriction and the method can be used, or a 2, meaning advantages generally outweigh theoretical or proven risks. Participants of the questionnaire were able to select “yes”, “uncertain”, or “no” for if they would recommend the LARC option for the specific medical condition (Table 4).

Table 4

### *Recommendations for LARC in Coexisting Condition*

Would you recommend for women with the following:	Copper T IUD			Levonorgestrel-releasing IUD			Etonogestrel implant (Nexplanon)		
	Yes (%)	Unsure (%)	No (%)	Yes (%)	Unsure (%)	No (%)	Yes (%)	Unsure (%)	No (%)
Menorrhagia	15.2	28.8	56.1	71.6	23.9	4.5	66.9	26.3	6.8
Dysmenorrhea	17.4	32.6	50.0	74.6	23.1	2.2	74.6	21.6	3.7
Fibroids	11.4	34.9	53.8	31.8	53.8	14.4	61.2	31.3	7.5
Diabetes	62.7	29.9	7.5	63.9	31.6	4.5	59.7	35.8	4.5
Obesity	64.2	29.1	6.7	64.9	29.1	6.0	51.5	35.8	12.7
Tobacco Use	70.2	23.9	6.0	58.2	31.3	10.5	56.7	33.6	9.7
HTN	68.4	26.3	5.3	60.2	32.3	7.5	58.2	35.8	6.0
IDA	25.0	34.9	40.2	72.2	23.3	4.5	70.7	26.3	3.0
Breastfeeding	53.8	31.1	15.2	46.2	32.6	21.2	38.6	40.2	21.2

## Frequency of LARC Discussion

When asked about providing contraceptive counseling to their patients, 102 providers or 75.6 percent reported “yes” and 33 providers reported “no”. Participants were asked about their frequency of discussing LARC options with females seeking contraception. Question 18 pertained to hormone-releasing and non-hormonal IUD discussion, and question 19 assessed hormonal implant discussion. The options were “always”, “usually”, “sometimes”, and “never” (See Table 5). Each LARC method was further analyzed according to specialty (Figure 9 and 10).

Table 5

### *LARC Discussion for Females Seeking Contraception*

<b>Among your female patients seeking contraception, how frequently do you discuss IUDs and implants. Choose one of the following answers:</b>	<b>IUDs</b>		<b>Implants</b>	
	<b>(n)</b>	<b>(%)</b>	<b>(n)</b>	<b>(%)</b>
Always	54	52.9	52	50.1
Usually	28	27.5	26	25.5
Sometimes	19	18.6	18	17.7
Never	1	1.0	6	5.9



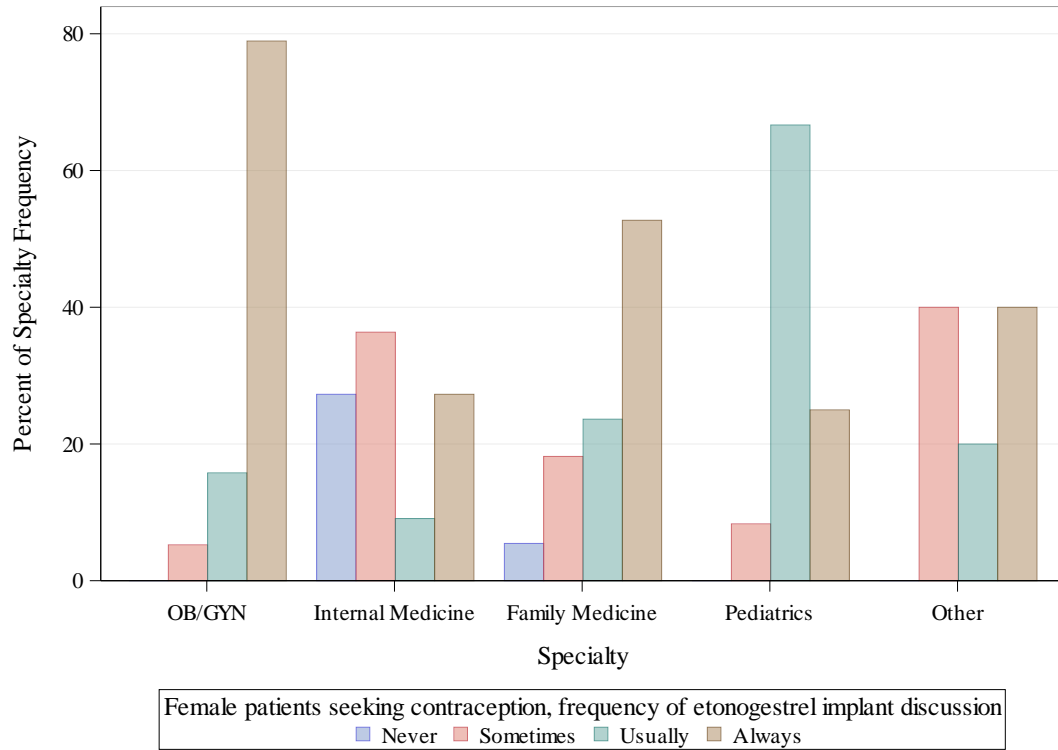


Figure 9. Frequency of Implant Discussion by Specialty

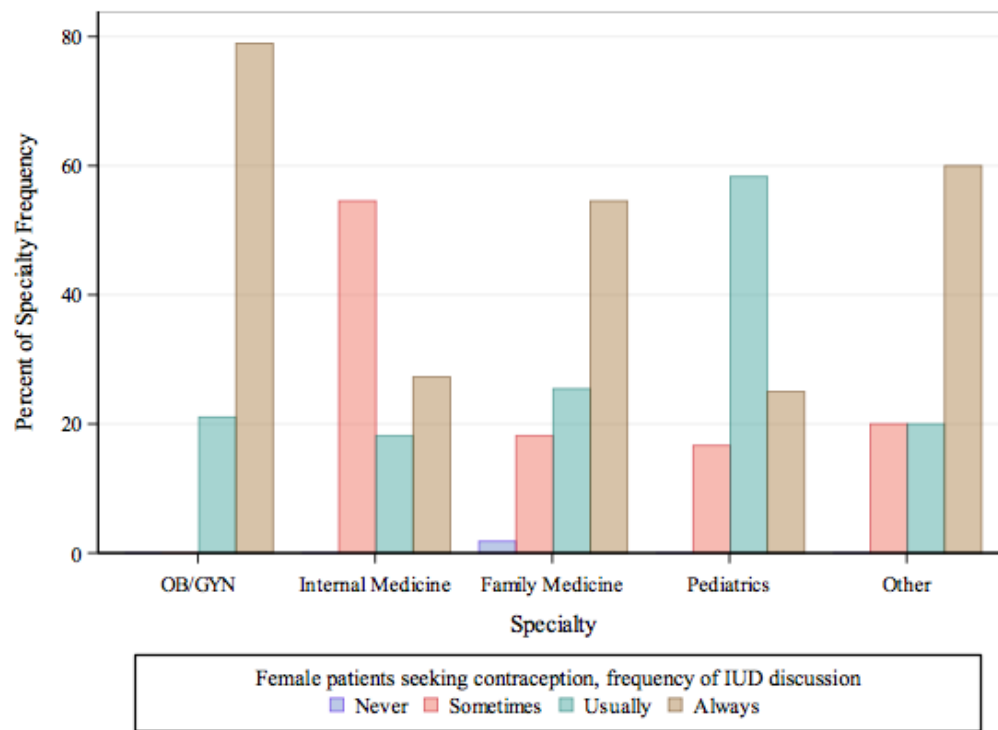


Figure 10. Frequency of IUD Discussion by Specialty

## Contraceptive Counseling Approach

Participants were asked to select their primary approach to contraceptive counseling. The different options included patient-directed, tiered approach (most to least effective), most commonly used to least commonly used, personal provider preference, don't have a specific approach, and other. The majority selected "patient-directed" with 66.7% of respondents followed by "tiered approach (most to least effective)" with 18.6% of respondents. The remainder of respondents selected "don't have a specific approach" (6.9%), "most commonly used to least commonly used" (3.9%), "personal provider preference (2.0%), and "other" (2.0%). The responses were further analyzed according to specialty (See Figure 11).

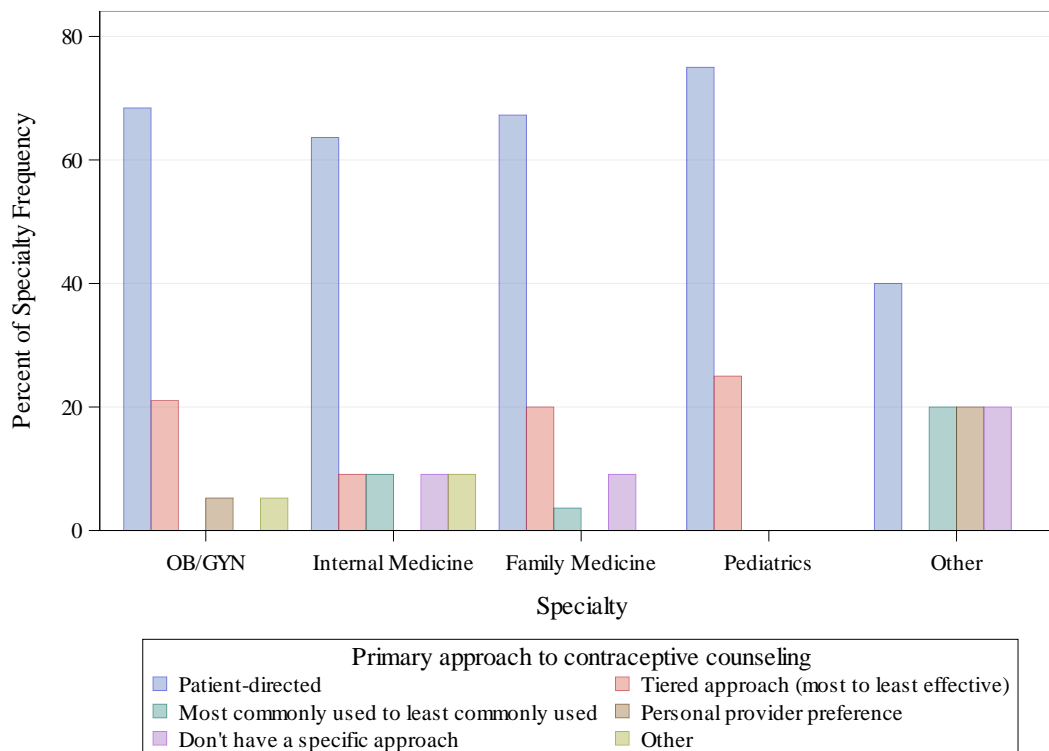


Figure 11. Primary Approach to Contraceptive Counseling by Specialty

Providers were asked to select the top three methods of contraception utilized by their female patients as the primary method. The respondents reported their female patients choosing the oral contraceptive pill most often followed by hormone-releasing IUD, injection, hormonal implant, and condom. Question 22 asked providers how often they recommended IUDs or implants as first-line contraception. Participants of the questionnaire were able to select “always”, “usually” “sometimes”, or “never”. A majority of the respondents selected “sometimes” at 37.3% followed by “usually” at 35.3%; the remainder of respondents selected “always” (22.6%) and “never” (4.9%). Further analysis was performed by specialty (See Figure 12).

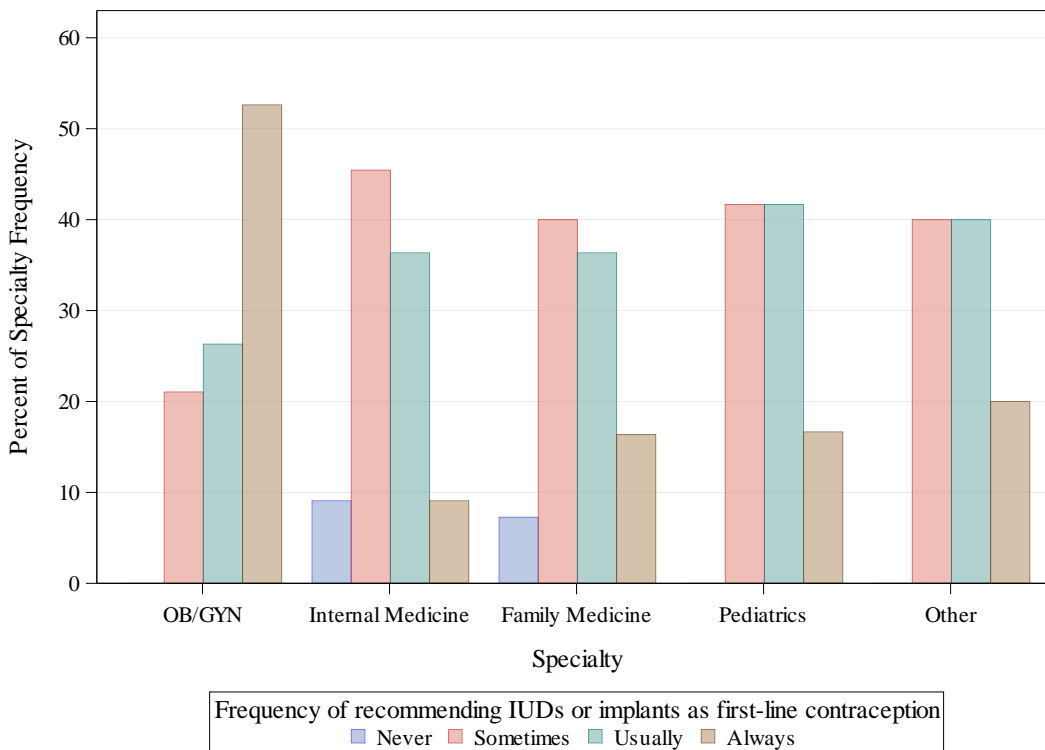


Figure 12. Recommending IUDs or Implants as First-Line Contraception by Specialty

## IUD and Implant Insertion

Question 23 and 27 asked participants if they inserted IUDs and implants. More respondents insert the hormonal implant than IUDs with 42 respondents inserting hormonal implants (42.0%) compared to 39 respondents inserting IUDs (38.6%). The insertion data was further analyzed according to specialty and type of LARC method (See Figure 13 and 14). The majority of providers reported “yes” when asked if they refer another provider or practice for IUD (67%) or implant (57.1%) insertion.

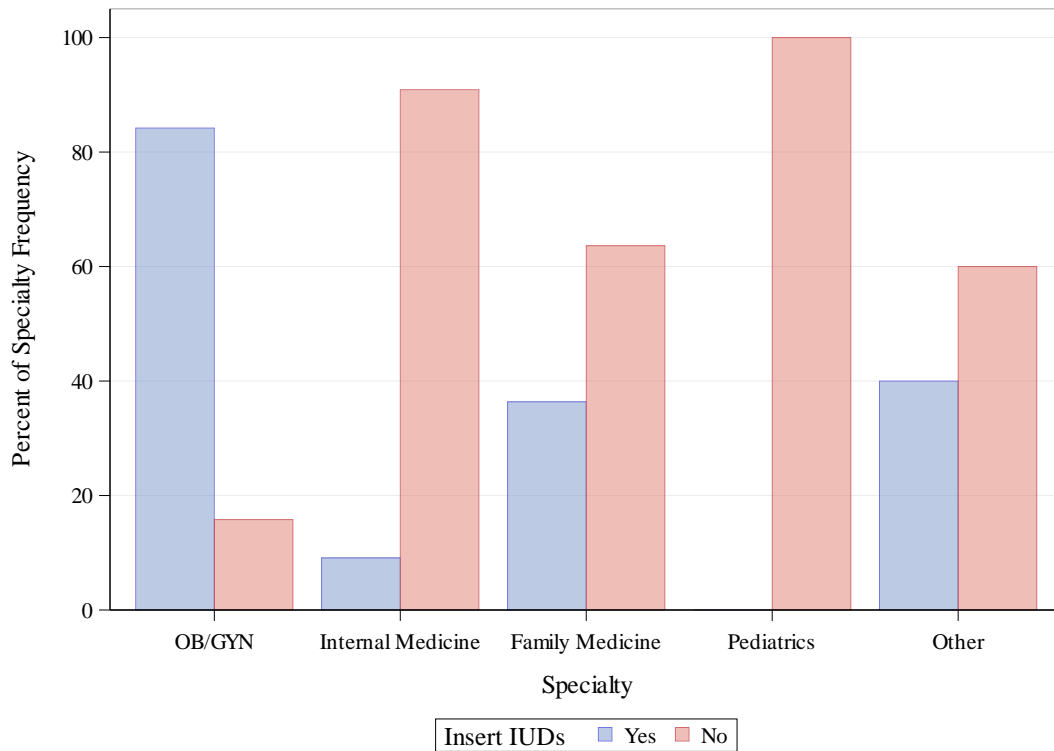


Figure 13. Providers Inserting IUDs by Specialty

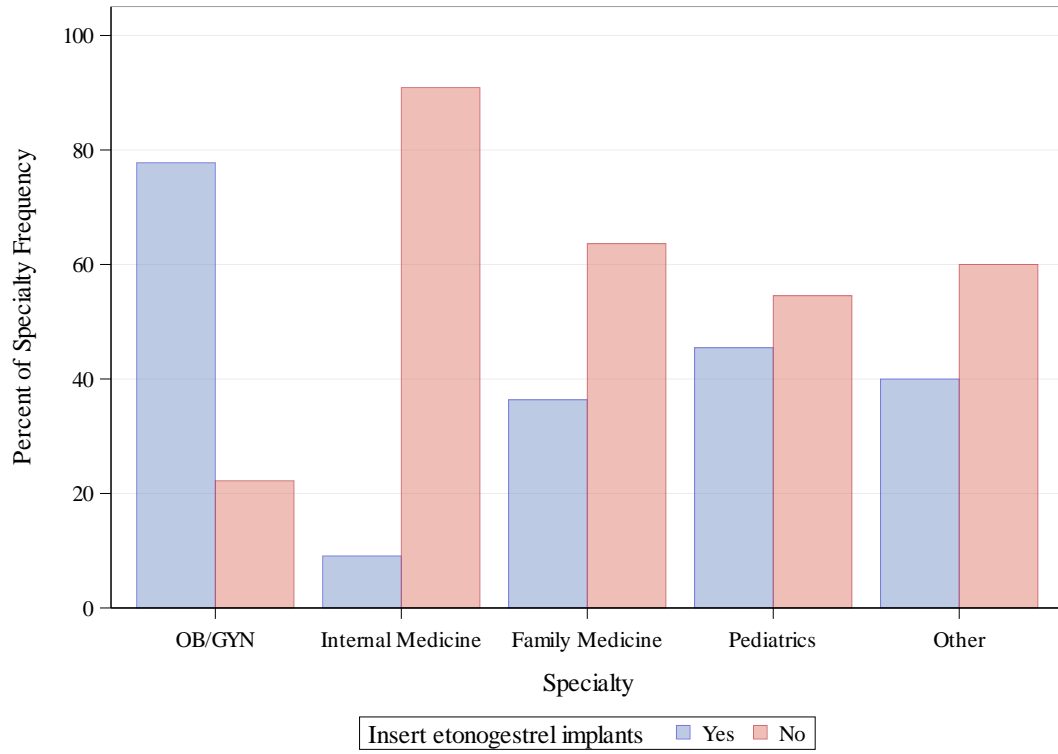


Figure 14. Providers Inserting Implants by Specialty

## Barriers to Increasing LARC Utilization

Participants were asked about barriers to increasing the use of IUDs and implants within their practice. Potential barriers were listed and participants could select “strongly agree”, “somewhat agree”, “neither agree nor disagree”, “somewhat disagree”, and “strongly disagree”. A few barriers identified, included patient preference, not enough need or desire in my patient population, lack of provider knowledge/training, lack of comfort with insertion, and cost of the method (See Table 6).

Table 6

### *Barriers to Increasing LARC Utilization*

<b>The following are barriers to increasing the use of IUD/implant in my practice:</b>		Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
		(%)	(%)	(%)	(%)	(%)
Patient preference	IUD	32.3	35.4	13.5	9.4	9.4
	Implant	31.3	47.9	5.2	9.4	6.3
Not enough need/desire in my patient population	IUD	22.5	26.5	15.3	18.4	17.4
	Implant	17.9	33.7	16.8	17.9	13.7
Lack of provider knowledge/training	IUD	17.0	18.0	12.0	21.0	32.0
	Implant	11.3	17.5	12.4	15.5	43.3
Lack of comfort with insertion	IUD	25.0	14.0	13.0	13.0	35.0
	Implant	21.7	11.3	12.4	13.4	41.2
Cost of the method	IUD	12.0	24.0	25.0	16.0	23.0
	Implant	9.3	16.5	33.0	14.4	26.8

## LARC Eligibility and Safety Concerns

Question 58 assessed the participants’ knowledge regarding IUD eligibility. Participants were able to select “yes”, “uncertain”, or “no” when asked about IUD eligibility in a variety of

patient populations (See Table 7). Question 59 asked participants about whether concerns of uterine perforation, expulsion, discomfort during insertion, sexually transmitted infections, pelvic inflammatory disease, infertility, changes in bleeding patterns, adolescence, non-monogamous, or interference with breastfeeding prevented the provider from recommending an IUD (See Table 8).

Table 7

*IUD Eligibility*

<b>Do you consider the following patients eligible for an IUD?</b> (NC) – Not contraindicated (C) – Contraindicated	<b>Yes</b>		<b>Uncertain</b>		<b>No</b>	
	<b>(n)</b>	<b>(%)</b>	<b>(n)</b>	<b>(%)</b>	<b>(n)</b>	<b>(%)</b>
Nulliparous women (NC)	107	83.6	16	12.5	5	3.9
Non-monogamous (NC)	91	71.7	20	15.8	16	12.6
Immediate postpartum (NC)	67	52.3	34	26.6	27	21.1
Immediate post-abortion (NC)	55	43.0	49	38.3	24	18.8
Post septic abortion (C)	2	1.6	53	41.7	72	56.7
History of STI in past 2 years (NC)	68	53.1	30	31.3	20	15.6
Current symptomatic gonorrhea or chlamydia infection (C)	5	3.9	26	20.3	97	75.8
Asymptomatic positive gonorrhea or chlamydia screening test (C)	15	11.7	33	25.8	80	62.5
History of ectopic pregnancy (NC)	50	39.1	56	43.8	22	17.2
History of pelvic inflammatory disease (NC)	50	39.1	49	38.3	29	22.7
Current pelvic inflammatory disease (C)	1	0.8	24	18.8	103	80.5
Adolescents (NC)	90	70.3	25	19.5	13	10.2

Table 8

*Concerns Preventing IUD Recommendation*

<b>How often do concerns about the following issues prevent you from recommending the IUD?</b>	<b>Always (%)</b>	<b>Usually (%)</b>	<b>Sometimes (%)</b>	<b>Never (%)</b>
Uterine perforation (at insertion)	8.1	2.4	38.2	51.2
Expulsion	3.3	2.5	40.2	54.1
Discomfort during insertion	1.6	7.3	39.0	52.0
STI	10.7	13.9	37.7	37.7
Pelvic inflammatory disease	20.3	13.0	41.5	25.2
Infertility	10.7	4.1	23.1	62.0
Changes in bleeding patterns	5.0	13.3	35.0	46.7
Adolescence	5.7	7.3	28.5	58.5
Non-monogamous	5.7	13.8	25.2	55.3
Interference with breastfeeding	4.1	7.3	22.0	66.7

**Educational Needs**

The final questions, 34 and 35, asked participants if they would consider providing IUDs and implants if additional training was provided. The majority of participants reported considering providing IUDs with 79 respondents (61.2%) reporting “yes”, 28 respondents (21.8%) reporting “no”, and 22 respondents (17.1%) reporting “uncertain”. Similar responses were gathered for participants considering providing implants with 81 respondents (62.3%) reporting “yes”, 31 respondent (23.9%) reporting “no”, and 18 respondents (13.9%) reporting “uncertain”.



## Post-Training Questionnaire Results

The training session consisted of an educational presentation followed by an insertion and removal hands-on training for one specific LARC method. The educational presentation had 14 participants in the audience. The LARC insertion and removal training was hosted by a qualified representative and training assistant. A post-training questionnaire (Appendix C) was administered at the conclusion of the session. A total of eight nurse practitioners completed the post-training questionnaire. The qualified representative, training assistant, and graduate students were excluded from the questionnaire. Following the training, 100% of participants planned to utilize the tiered-effectiveness counseling and insert LARCs in their practice (Table 8).

Table 9

### *Post-Training Evaluation Questionnaire Response*

<b>Post-Training Evaluation</b>	<b>(n)</b>	<b>(%)</b>
<b>Prior to the training, did you utilize the tiered approach for contraceptive counseling?</b>		
Yes	4	50
No	4	50
<b>Following the training, do you plan to utilize the tiered approach for contraceptive counseling?</b>		
Yes	8	100
No	0	0
<b>Prior to the training, did you insert LARCs in your practice?</b>		
Yes	1	12.5
No	7	87.5
<b>Following the training, do you plan to insert LARCs in your practice?</b>		
Yes	8	100
No	0	0

## **CHAPTER SIX. DISCUSSION AND RECOMMENDATIONS**

The purpose of this practice improvement project was to understand and improve nurse practitioners' knowledge and awareness about LARCs. Diffusion of Innovation by Everett Rogers (2003) was used to assist with the development and implementation of the project. The process of diffusion is applicable to LARCs and understanding why potential users adopt or reject LARC methods as well as developing an intervention to increase utilization.

### **Interpretation of Results**

#### **Objective One**

The first objective, recognize current provider practices, knowledge, and beliefs on LARC utilization, was completed. Completion of this objective was met via collection of the LARC needs assessment questionnaire by providers. A total of 147 responses were analyzed to better understand the current provider practices, knowledge, beliefs on LARC utilization. Furthermore, a majority (144) of the respondents were nurse practitioners bringing forth new information to understand the knowledge gaps present for nurse practitioners in Minnesota and North Dakota.

#### **Objective Two**

The second objective of the practice improvement project, identify knowledge gaps and barriers existing to LARC utilization by comparing the LARC needs assessment responses to CDC's medical eligibility criteria for contraceptive care, was met. Knowledge gaps were determined in the following categories: recommendations for LARC in coexisting condition, LARC eligibility, and safety concerns. Rogers (2003) discusses the importance of obtaining a thorough understanding of prior practices and beliefs before disseminating knowledge about an innovation, in this case LARCs.

### ***Recommendations for LARC in Coexisting Condition***

A knowledge gap was present in regard to the providers' knowledge of current medical eligibility criteria (MEC) guidelines published by the CDC. Participants of the questionnaire were asked if they would recommend a LARC to women with the following conditions: menorrhagia, dysmenorrhea, fibroids, diabetes, obesity, tobacco use, history of hypertension (HTN), iron-deficiency anemia (IDA), and breastfeeding immediately postpartum. According the CDC, all of the previously mentioned conditions are considered a 1, meaning there is no restriction and the method can be used, or a 2, meaning advantages generally outweigh theoretical or proven risks. Providers possessed uncertainty with many of the conditions demonstrated by selection of "unsure"; over 30% of providers were "unsure" if a hormone-releasing IUD or hormonal implant should be utilized in patients with diabetes, hypertension, and tobacco use.

### ***LARC Eligibility***

Similar to uncertainty in recommendations for women with coexisting conditions, inaccurate patient eligibility was determined as a knowledge gap. Over 40% of providers reported being "unsure" or "no" to recommending a LARC to women who were immediate postpartum, post-abortion, history of STI in the past 2 years, history of ectopic pregnancy, and history of PID; all conditions being a 1 or 2 on MEC guidelines and not a contraindication to LARC use. Participants were knowledgeable about contraindications to LARC use, including post-septic abortion, current symptomatic gonorrhea or chlamydia infection, and current PID.

### ***Safety Concerns***

Elevated safety concerns were demonstrated following analysis of the questionnaire. Uterine perforation, expulsion, STI, PID, and change in bleeding pattern being the highest

concerns. Over 45% of participants selected “always”, “usually”, or “sometimes” to the concern of uterine perforation and expulsion preventing them from recommending an IUD. Over 75% of participants selected “always”, “usually”, “sometimes” to concerns of pelvic inflammatory disease. The risk for uterine perforation is less than one per 1000 women and risk for spontaneous expulsion less than 10 percent during the first year (Stoddard et al., 2011). Risks exist with all methods of contraception. Providers must have an accurate understanding of the risks for each contraceptive method and discuss these risks and benefits with their patients.

### ***Barriers to LARC Utilization***

Analysis of the questionnaire results demonstrated the following barriers to LARC utilization: lack of LARC training, lack of comfort with LARC counseling, frequency of LARC discussion, contraceptive counseling approach, and patient preference. Over 57% providers had not received previous training to insert IUDs; the percentage of providers reporting no previous training for implants was higher at over 60%. Additionally, over 30% of providers reported being “uncomfortable” or “very uncomfortable” providing counseling to women about the non-hormonal IUD and hormonal implant. Similar to the literature review findings, fewer providers in family medicine, pediatrics, and internal medicine are discussing LARC options compared to providers in OB/GYN (Harper et al., 2012).

One important finding was the lack of providers utilizing tiered-effectiveness counseling. Only 18.6% of providers reported use of this method; a majority of providers reporting “patient-directed approach” for contraceptive counseling. Patient-directed contraceptive counseling involves the patient relaying their preferred method and the provider expanding on information about that specific method. The recommended method of contraceptive counseling is the tiered-effectiveness approach and is endorsed by CDC, WHO, AAFP, and ACOG. (Gavin et al., 2014).

One study found approximately 50 percent of females preferred provider involvement in their contraceptive decision (Dehlendorf, Diedrich, Drey, Postone, & Steinauer, 2010). Thus, use of the “patient-directed approach” may in turn limit females selecting LARC methods due to lack of knowledge on available methods. When asked about barriers to increasing utilization, patient preference was selected by the most providers followed by lack of need or desire in their practice and lack of training and/or comfort with insertion. All barriers are consistent with those discovered in the review of literature (Garrett et al., 2015; Yoost, 2014).

### **Objective Three**

The third objective of the project “design an educational, pre-conference session for the pharmacology conference hosted by the North Dakota Nurse Practitioner Association to disseminate findings and provide hands-on training by a qualified representative” was met. The goal of the pre-conference session was to address the knowledge gaps determined in the questionnaire, educate providers on current evidence-based contraceptive counseling recommendations, and provide a hands-on training opportunity.

The pre-conference session was first offered to previous rural nurse practitioner preceptors of the university. The goal was to target nurse practitioners practicing in rural settings. Due to the low response from this cohort, invitation was extended to urban nurse practitioners. Nurse practitioner students were also asked to join the training session but were unable to complete the post-training questionnaire. The educational presentation was attended by 14 participants with 8 participants being eligible to complete the post-training questionnaire.

An educational presentation was provided to participants and lasted approximately 10 minutes in length. The PowerPoint presentation is available in Appendix E. To move through Rogers’s (2003) knowledge and persuasion stage, discussion included awareness, how-to

knowledge, and principals of the innovation. The presentation included the topics of unplanned pregnancy statistics, current recommendations, contraceptive counseling flow charts, project description, project results, and identified knowledge gaps. Each participant was provided with a contraceptive flow chart to utilize in their practice. The qualified representative was present along with a certified trainer to assist with the education and hands-on training for the hormonal implant. The certified trainer utilizes LARC methods within her practice and was able to provide practical examples and troubleshooting tips to providers at the training event.

#### **Objective Four**

The final objective, evaluate the impact of the pre-conference session by assessing provider intention to implement LARCs into practice, was met. Collection and analysis of the post-training questionnaire demonstrated 100% of the providers in attendance planned to incorporate tiered-effectiveness counseling and insertion of LARCs into their practice. One of the eight participants reported previously inserting LARCs prior to the training session. The post-training questionnaire following the educational presentation and hands-on training assessed the participants planned change or Roger's decision stage. Participants chose to adopt or reject the innovation. In this case, 100% of participants chose to adopt the innovation of LARCs. Due to the time constraints of the project, Roger's implementation and confirmation stages were not assessed.

#### **Limitations**

Several limitations exist when examining this practice improvement project. Limitations are influences or impacts the researcher cannot control (Price & Murnan, 2004). Some participants did not answer all of the questions within the LARC needs assessment questionnaire. The questions unanswered by participants may have yielded slightly different results. Future

research utilizing the questionnaire should require participants to answer the question before moving forward.

In order to gain participation for the electronic questionnaire, Facebook, electronic newsletters, and email listservs were used for advertisement and invitation. The electronic questionnaire had an incentive for completion, which may have led to inaccurate reporting. Participants may have answered the questions quickly or potentially without reading the question in its entirety. The questionnaire was long with an estimated time for completion of approximately 10 minutes. The length of the questionnaire may have led to survey fatigue and skewed the results. The title of the practice improvement project may have yielded more participants with interests in women's health topics and/or LARCs. Participants with interest in women's health topics may possess a higher knowledge of current guidelines, evidence-based practice, and medical eligibility criteria surrounding LARCs.

The next limitation was the number of participants attending the educational training session. The class size for the hands-on training session was not as large as initially planned. A few different factors may have affected participation, including provider schedule conflict, required distance to travel, previous insertion/removal training for the specific LARC method, or perceived knowledge or beliefs of LARCs. The final limitation was the post-training questionnaire completed by providers attending the training session. Providers were asked if they planned to incorporate tiered-effectiveness counseling and insert LARCs in their practice. The providers may have overstated their planned adherence, potentially altering the results.

### **Recommendations**

The LARC needs assessment questionnaire demonstrated knowledge gaps and barriers to LARC utilization exist. Recommendations include further development and implementation of

education to target the knowledge gaps and barriers. Further hands-on training opportunities with supplemental contraceptive counseling education should be offered. The post-training questionnaire demonstrated providers plan to incorporate both tiered-effectiveness counseling and insertion of LARCs in their practice. Additional training opportunities within multiple clinic sites may increase participation due to convenience. Training opportunities should incorporate both IUD and implant methods to increase the providers' ability to offer comprehensive family planning services at each clinic site.

The integration of comprehensive contraceptive education should be incorporated into medical school, nurse practitioner, and physician assistant programs. This includes discussion on tiered-effectiveness counseling, the benefits of LARC utilization in adolescents and adult females, medical eligibility criteria, and insertion/removal training. Exposure to LARCs during education may be effective in increasing utilization of LARCs. New MDs, NPs, and PAs entering the workforce may become mentors to other providers in the clinic setting.

Furthermore, incorporation of patient education throughout medical facilities is recommended. Posters, brochures, and short videos would assist with targeting the patient-based barrier. Wait times should be utilized as an educational opportunity; providing education during wait times may result in improved provider-patient communication and better outcomes (Sherwin, McKeown, Evans, & Bhattacharyya, 2013). Examples include incorporation of the contraceptive flow chart published by the WHO and CDC in exam rooms, a short video on contraception choices prior to a yearly physical or contraception visit, or the nurse asking the patient "would you like to become pregnant in the next year?". The addition of education within the clinic setting may engage patients to take further ownership of their health and wellbeing (Sherwin et al., 2013).



### **Implications for Practice**

This practice improvement project added to the literature by provided a further understanding of provider knowledge and awareness of LARCs, specifically nurse practitioners practicing in Minnesota and North Dakota. The online questionnaire assisted with the development of a small pilot program to target early adopters. Nurse practitioners attending the hands-on training session were targeted as potential early adopters. The results from the online questionnaire were discussed with a goal of bridging the knowledge gaps surrounding LARC utilization. Dissemination of the research findings also assisted with active and passive diffusion of the LARC innovation. Nurse practitioners attending the training session may perform contraceptive counseling in the tiered-effectiveness approach, perform LARC insertion, or educate a coworker on current medical eligibility criteria guidelines.

Many implications exist for advanced practice nursing regarding LARC utilization. The focus of healthcare in the United States has shifted to preventative medicine. With the new emphasis being placed on primary care, nurse practitioners are the front-line providers to delivering comprehensive family planning services. Nurse practitioners providing primary care services should possess comprehensive knowledge of all forms of contraception and ideally be trained to insert LARC methods. Nurse practitioners trained on the insertion and removal of LARC methods can serve as preceptors to other providers in the clinic including physicians, physician assistants, and fellow nurse practitioners. Nurse practitioners providing and promoting evidence-based care leads to better patient outcomes and demonstrates leadership.

### **Implications for Future Research**

The underutilization of LARC methods is a multifaceted problem. Ongoing efforts and research must continue in order to increase LARC utilization and decrease unintended pregnancy

rates. The literature review and LARC needs assessment questionnaire demonstrated many barriers to LARC utilization, including provider, patient, and financial barriers. Future research on this subject should focus on addressing each of these barriers. To target the provider-linked barrier, research supported increasing the number of nurse practitioners participating in hands-on training opportunities. Greater than 60% of family medicine providers reported not inserting IUDs or implants in their practice. Additionally, providers reported lack of training and lack of comfort with insertion as a barrier to increasing LARC utilization. Women have increased access to LARCs when providers are knowledgeable about methods, provide comprehensive counseling, trained on insertion, and provide same day service (Strasser et al., 2016). Additional research targeting increasing provider competence and confidence via in-services, conferences, or workshops is needed.

Patient-linked barriers were apparent during the review of literature and LARC needs assessment questionnaire. Social norms play a significant role in contraceptive choices for women; women report using oral contraceptives due to popularity among friends (Garrett et al, 2015). Misconceptions and exaggerated health concerns surround LARC methods (Russo, Miller, & Gold, 2013). Providers reported patient preference to be the biggest barrier to increasing LARC utilization. The oral contraceptive pill was the primary method choice reported by providers completing the questionnaire. LARC utilization may increase if healthcare providers perform tiered-effectiveness counseling prior to asking the patients about their preference. Once the provider relays the information about effectiveness and longevity of each method, the patient may change from their original preference.

Development of a comprehensive contraception educational session for females with childbearing potential may be beneficial to increase their knowledge and target misconceptions

regarding LARC methods. Financial barriers have also contributed to low uptake for LARC methods across the United States. Research in Colorado and St. Louis, Missouri has demonstrated providing LARCs at low- or no-cost increases uptake. Assisting females with answering insurance questions and/or finding coverage for the most effective forms of contraception would target the financial-linked barrier.

### **Application to Other Doctor of Nursing Practice Roles**

The Doctor of Nursing Practice has many different roles; many of which were required throughout the process of designing and implementation of the practice improvement project. Knowledge was gained by collection and analysis of the LARC needs assessment questionnaire. The findings of the questionnaire were disseminated to nurse practitioners to assist with furthering the knowledge of healthcare providers and potentially increasing the health of their patients. Innovation and collaboration were demonstrated by nurse practitioners attending the educational, hands-on training session. Nurse practitioners learned about insertion of a LARC method, allowing them to implement the innovation within their practice. Collaboration occurred throughout the practice improvement project between the author and healthcare providers, as well as among nurse practitioners attending the training session.

Unintended pregnancies have immediate and life-long implications. Nurse practitioners play an integral role in providing comprehensive contraceptive counseling to all females with childbearing potential. Increasing the percentage of women aged 15 to 44 years that adopt or continue use of the most effective method of contraception is an objective of Healthy People 2020 (HHS, 2018). Nurse practitioners within all setting and specialties must be knowledgeable about the different forms of contraception along with the efficacy, safety, and side effect profile of each method. All nurse practitioner may not be trained to insert LARC methods; appropriate

and timely referrals assist with increasing LARC utilization and decreasing unintended pregnancies. Over time, the adoption of the LARCs by healthcare providers and patients may decrease infant and maternal morbidity and mortality rates, decrease healthcare costs, and empower females across the United States.

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## APPENDIX A. ONLINE LARC NEEDS ASSESSMENT

### Understanding provider knowledge and awareness about long-acting reversible contraceptives

Welcome to the research study! We are interested in understanding provider knowledge and awareness about long-acting reversible contraceptives. You will be presented with information relevant to long-reversible contraceptives and asked to answer some questions about it. Please be assured that your responses will be kept completely confidential.

The study should take you around 10 minutes to complete, and you will be entered into a drawing for one of two \$100 gift cards for your participation. Your participation in this research is voluntary. You have the right to withdraw at any point during the study, for any reason, and without any prejudice.

Mykell Barnacle, DNP, FNP-BC is an assistant professor at NDSU's School of Nursing and serves as the principal investigator. Sarah Hanson, RN is a graduate student in the DNP program at NDSU and serves as co-investigator. If you would like to contact the principal investigator or co-investigator in the study to discuss this research, please e-mail Mykell.Barnacle@ndus.edu or Sarah.Hofer@ndus.edu. Participants may contact the IRB office with questions or concerns about the research (phone: 701.231.8995, toll-free: 855.800.6717, or email: ndsu.irb@ndsu.edu).

By clicking the button below, you acknowledge that your participation in the study is voluntary, you are 18 years of age, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.

Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device.

- I consent, begin the study
- I do not consent, I do not wish to participate

#### Demographics

1. How many years have you been in practice (post-training)? Choose one of the following answers:

<input type="checkbox"/> 0-5
<input type="checkbox"/> 6-10
<input type="checkbox"/> 11-15
<input type="checkbox"/> 16-20
<input type="checkbox"/> 21 or more

2. What are your professional qualifications? Choose one of the following answers:

<input type="checkbox"/> Attending physician
<input type="checkbox"/> Fellow/resident
<input type="checkbox"/> Nurse Practitioner
<input type="checkbox"/> Nurse Midwife
<input type="checkbox"/> Physician Assistant
<input type="checkbox"/> Other _____

3. Do you practice in the state of Minnesota or North Dakota?

<input type="checkbox"/> Yes
<input type="checkbox"/> No

**If No – hard stop, survey complete**

4.

Do you provide direct patient care?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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**If No – hard stop, survey complete**

5. What is your specialty? Choose one of the following answers:

<input type="checkbox"/> OB/GYN or Women’s Health
<input type="checkbox"/> Internal Medicine/Adult
<input type="checkbox"/> Family Medicine
<input type="checkbox"/> Pediatrics
<input type="checkbox"/> Midwifery
<input type="checkbox"/> Other _____

6. What type of setting is your main clinical practice? Choose one of the following answers:

<input type="checkbox"/> Community hospital/clinic
<input type="checkbox"/> University medical center/clinic
<input type="checkbox"/> Private clinic/Multispecialty clinic
<input type="checkbox"/> Family planning clinic
<input type="checkbox"/> Federally Qualified Health Center (FQHC)
<input type="checkbox"/> Rural Health Center (RHC)
<input type="checkbox"/> University/College Health Center
<input type="checkbox"/> School-based health center
<input type="checkbox"/> Other

7. What is the age range of your patients? Check any that apply:

<input type="checkbox"/> 0-18 years
<input type="checkbox"/> 18-24 years
<input type="checkbox"/> 25-49 years
<input type="checkbox"/> 50 years and older

**Knowledge**

8.

Have you received any training to provide IUD counseling?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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If yes, check any that apply

How long ago was this training?	<input type="checkbox"/> 0-5 years	<input type="checkbox"/> 6-10 years	<input type="checkbox"/> 11-15 years	<input type="checkbox"/> 16-20 years	<input type="checkbox"/> >20 years
How would you describe this training?	<input type="checkbox"/> Introductory		<input type="checkbox"/> Intermediate		<input type="checkbox"/> In-depth
Where did you receive this training?	<input type="checkbox"/> In school	<input type="checkbox"/> In residency/ fellowship/ clinical training		<input type="checkbox"/> In practice/ arranged by employer	<input type="checkbox"/> Other (CME, conference)

9.

Have you received any training to provide IUD insertion?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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If yes, check any that apply

How long ago was this training?	<input type="checkbox"/> 0-5 years	<input type="checkbox"/> 6-10 years	<input type="checkbox"/> 11-15 years	<input type="checkbox"/> 16-20 years	<input type="checkbox"/> >20 years
How would you describe this training?	<input type="checkbox"/> Introductory		<input type="checkbox"/> Intermediate		<input type="checkbox"/> In-depth
Where did you receive this training?	<input type="checkbox"/> In school	<input type="checkbox"/> In residency/ fellowship/ clinical training		<input type="checkbox"/> In practice/ arranged by employer	<input type="checkbox"/> Other (CME, conference)

10.

Have you received any training to provide etonogestrel implant (Nexplanon®) counseling?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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If yes, check any that apply

How long ago was this training?	<input type="checkbox"/> 0-5 years	<input type="checkbox"/> 6-10 years	<input type="checkbox"/> 11-15 years	<input type="checkbox"/> 16-20 years	<input type="checkbox"/> >20 years
How would you describe this training?	<input type="checkbox"/> Introductory		<input type="checkbox"/> Intermediate		<input type="checkbox"/> In-depth
Where did you receive this training?	<input type="checkbox"/> In school	<input type="checkbox"/> In residency/ fellowship/ clinical training	<input type="checkbox"/> In practice/ arranged by employer		<input type="checkbox"/> Other (CME, conference)

11.

Have you received any training to provide etonogestrel implant (Nexplanon®) insertion?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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If yes, check any that apply

How long ago was this training?	<input type="checkbox"/> 0-5 years	<input type="checkbox"/> 6-10 years	<input type="checkbox"/> 11-15 years	<input type="checkbox"/> 16-20 years	<input type="checkbox"/> >20 years
How would you describe this training?	<input type="checkbox"/> Introductory		<input type="checkbox"/> Intermediate		<input type="checkbox"/> In-depth
Where did you receive this training?	<input type="checkbox"/> In school	<input type="checkbox"/> In residency/ fellowship/ clinical training	<input type="checkbox"/> In practice/ arranged by employer		<input type="checkbox"/> Other (CME, conference)

12. How would you rate your knowledge of the Copper T IUD:

	High	Moderate	Low	None
Contraceptive efficacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Side effects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insertion/removal procedure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. How would you rate your knowledge of the levonorgestrel-releasing IUDs:

	High	Moderate	Low	None
Contraceptive efficacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Side effects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insertion/removal procedure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. How would you rate your knowledge of the etonogestrel implant (Nexplanon®):

	High	Moderate	Low	None
Contraceptive efficacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Side effects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insertion/removal procedure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. How comfortable do you feel counseling a woman about:

	Very Comfortable	Comfortable	Uncomfortable	Very Uncomfortable
Copper T IUD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Levonorgestrel-releasing IUDs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. Would you recommend an IUD or implant for women with the following?

	Copper T IUD			Levonorgestrel-releasing IUDs			Etonogestrel implant (Nexplanon®)		
	Yes	Uncertain	No	Yes	Uncertain	No	Yes	No	Unsure
Menorrhagia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dysmenorrhea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fibroids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diabetes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Obesity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tobacco use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
History of HTN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Iron-deficiency anemia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Breastfeeding immediately postpartum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Current Practice**

17.

Do you provide contraception counseling to your patients?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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If no skip to **Attitudes – question 31**

**If yes to 17, answer 18-30:**

18.

Among your female patients seeking contraception, how frequently do you discuss the IUD? Choose one of the following answers:	<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Usually	<input type="checkbox"/> Always
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19.

Among your female patients seeking contraception, how frequently do you discuss the etonogestrel implant? Choose one of the following answers:	<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Usually	<input type="checkbox"/> Always
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20. What is your **primary** approach to contraceptive counseling? Choose one of the following answers:

<input type="checkbox"/> Patient-directed
<input type="checkbox"/> Tiered approach (most to least effective)
<input type="checkbox"/> Most commonly used to least commonly used
<input type="checkbox"/> Personal provider preference
<input type="checkbox"/> Don't have a specific approach
<input type="checkbox"/> Other not listed

21. What method of contraception do your female patients choose most often as their primary method? Select the top three:

<input type="checkbox"/> Condom	<input type="checkbox"/> Diaphragm	<input type="checkbox"/> Oral contraceptive pill
<input type="checkbox"/> Vaginal ring	<input type="checkbox"/> Patch	<input type="checkbox"/> Injection
<input type="checkbox"/> Implant (Nexplanon®)	<input type="checkbox"/> IUD – Levonorgestrel-releasing (Mirena®, Skyla®, Liletta®, Kyleena®)	<input type="checkbox"/> IUD – Copper T (Paragard®)
<input type="checkbox"/> Sterilization	<input type="checkbox"/> Emergency contraception	<input type="checkbox"/> Other



22.

How often do you recommend IUDs or implants as first-line contraception? Choose one of the following answers:	<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Usually	<input type="checkbox"/> Always
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23.

Do you insert IUDs?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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**If yes to 23, answer 24:**

24. How often do you insert the following IUDs?

Copper T IUD	<input type="checkbox"/> At least once a week	<input type="checkbox"/> A few times a month	<input type="checkbox"/> Once a month	<input type="checkbox"/> Less than once a month	<input type="checkbox"/> Never
Levonorgestrel-releasing IUD	<input type="checkbox"/> At least once a week	<input type="checkbox"/> A few times a month	<input type="checkbox"/> Once a month	<input type="checkbox"/> Less than once a month	<input type="checkbox"/> Never

25. The following are barriers to increasing the use of the IUD in my practice:

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Patient preference					
Not enough need/desire in my patient population					
Objection of patient's partner					
Lack of provider knowledge/training					
Lack of comfort with method					
Lack of comfort with insertion					
Safety of method					
Efficacy of method					
Appropriateness of method for my patients					
Cost of method					
Problems with insurance preauthorization					
Problems with insurance reimbursement					
Lack of time in scheduled for insertion/problems with clinic flow					
Number of visits needed to counsel/insert					
Lack of support at practice for insertion					
Difficulty obtaining and/or maintaining a supply of devices					
Liability					

26.

Do you refer to another provider/practice for IUD insertion?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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27.

Do you insert etonogestrel implants?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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**If yes to 27, answer 28:**

28. How often do you insert etonogestrel implants??

Choose one of the following answers	<input type="checkbox"/> At least once a week	<input type="checkbox"/> A few times a month	<input type="checkbox"/> Once a month	<input type="checkbox"/> Less than once a month
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29. The following are barriers to increasing the use of the etonogestrel implants in my practice:

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Patient preference					
Not enough need/desire in my patient population					
Objection of patient's partner					
Lack of provider knowledge/training					
Lack of comfort with method					
Lack of comfort with insertion					
Safety of method					
Efficacy of method					
Appropriateness of method for my patients					
Cost of method					
Problems with insurance preauthorization					
Problems with insurance reimbursement					
Lack of time in scheduled for insertion/problems with clinic flow					
Number of visits needed to counsel/insert					
Lack of support at practice for insertion					
Difficulty obtaining and/or maintaining a supply of devices					
Liability					

30.

Do you refer to another provider/practice for etonogestrel implant insertion?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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**Attitudes**

31. Do you consider the following methods to be safe:

	Yes	Uncertain	No
IUD for adult women	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IUD for adolescents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implant for adult women	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implant for adolescents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

32. Do you consider the following patients eligible for an IUD?

	Yes	Uncertain	No
Nulliparous women	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-monogamous (multiple partners)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immediate post-partum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immediate post-abortion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post septic abortion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
History of sexually transmitted infection in past 2 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Current symptomatic gonorrhea or chlamydia infection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Asymptomatic positive gonorrhea or chlamydia screening test	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
History of ectopic pregnancy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
History of pelvic inflammatory disease (PID)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Current pelvic inflammatory disease (PID)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adolescents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

33. How often do concerns about the following issues prevent you from recommending the IUD?

	Never	Sometimes	Usually	Always
Uterine perforation [at insertion]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Expulsion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discomfort during insertion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sexually transmitted infections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pelvic inflammatory disease (PID)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Infertility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Changes in bleeding patterns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adolescence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiple partners (non-monogamous)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interference with breastfeeding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Educational Needs

34.

Would you consider providing IUDs to women if you received additional training? Choose one of the following answers	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
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35.

Would you consider providing the etonogestrel implant to women if you received additional training? Choose one of the following answers	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
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### END OF SURVEY

Thank you for completing our survey. You will now be given the opportunity to provide your contact information in order to receive information on the results of the survey as well as on training and educational opportunities. You may also choose to enter a raffle for a chance to win a \$100 gift card. Providing your name and contact information is voluntary, and this contact information cannot be linked back to your survey answers.

1.

	Yes	No
I would like to receive information about additional training on long-acting reversible contraception	<input type="checkbox"/>	<input type="checkbox"/>

2.

	Yes	No
I would like to receive results of the LARC needs assessment survey	<input type="checkbox"/>	<input type="checkbox"/>

3.

	Yes	No
I would like to be entered into the raffle for a chance at a \$100 gift card	<input type="checkbox"/>	<input type="checkbox"/>

### If yes to 1, 2 or 3.

Name:

Practice:

Address:

City:

State:

Postal code:

Email:

## APPENDIX B. INSTRUMENT PERMISSION

**From:** Woike, Adrienne J [Adrienne.Woike@med.uvm.edu](mailto:Adrienne.Woike@med.uvm.edu)  
**Subject:** RE: LARC needs assessment survey  
**Date:** September 26, 2017 at 9:21 AM  
**To:** Hanson, Sarah [sarah.hofer@ndsu.edu](mailto:sarah.hofer@ndsu.edu), Adrienne Woike [Adrienne.Woike@uvm.edu](mailto:Adrienne.Woike@uvm.edu)



Hi Sarah,  
Yes, you can use our needs assessment survey as long as you credit us. I also have the survey in a Word document and can send that to you if it is easier for you to use.  
Your project sounds very interesting. Good luck with your dissertation. Please let me know if you have any questions or if there is anything else I can help you with.  
Best,  
Adrienne

Adrienne Woike, MS, RN, WHNP

-----Original Message-----

**From:** Hanson, Sarah [<mailto:sarah.hofer@ndsu.edu>]  
**Sent:** Monday, September 25, 2017 9:57 PM  
**To:** Adrienne Woike <[Adrienne.Woike@uvm.edu](mailto:Adrienne.Woike@uvm.edu)>  
**Subject:** LARC needs assessment survey

Hello,

My name is Sarah Hanson, and I am a DNP student at North Dakota State University. I am currently in the planning stages of my dissertation. I plan to implement a survey and learning module to North Dakota providers in order to assess and increase knowledge on LARC methods.

I was wondering if the organization would allow permission to incorporate the needs assessment survey into my dissertation with proper credit?

Thank you for your time,  
Sarah Hanson, RN  
North Dakota State University

## APPENDIX C. POST TRAINING QUESTIONNAIRE

### Post-Training Evaluation Form

1. Prior to the training, did you utilize the tiered approach (most to least effective) for contraceptive counseling?
  - a. Yes
  - b. No
2. Following the training, do you plan to utilize the tiered approach (most to least effective) for contraceptive counseling?
  - a. Yes
  - b. No
3. Prior to the training, did you insert LARCs (IUDs, implants) in your practice?
  - a. Yes
  - b. No
4. Following the training, do you plan to insert LARCs (IUDs, implants) in your practice?
  - a. Yes
  - b. No

## APPENDIX D. IRB DETERMINATION



March 19, 2018

Dr. Mykell Barnacle  
Nursing

Re: IRB Determination of Exempt Human Subjects Research:  
Protocol #PH18210, "Understanding Provider Knowledge and Awareness of Long-Acting Reversible Contraceptives"

Co-investigator(s) and research team: Sarah Hanson  
Date of Exempt Determination: 3/19/2018 Expiration Date: 3/18/2021  
Study site(s): online  
Sponsor: n/a

The above referenced human subjects research project has been certified as exempt (category #2b) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, Protection of Human Subjects). This determination is based on the revised protocol submission (received 3/19/2018).

Please also note the following:

- If you wish to continue the research after the expiration, submit a request for recertification several weeks prior to the expiration.
- The study must be conducted as described in the approved protocol. Changes to this protocol must be approved prior to initiating, unless the changes are necessary to eliminate an immediate hazard to subjects.
- Notify the IRB promptly of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
- Report any significant new findings that may affect the risks and benefits to the participants and the IRB.

Research records may be subject to a random or directed audit at any time to verify compliance with IRB standard operating procedures.

Thank you for your cooperation with NDSU IRB procedures. Best wishes for a successful study.  
Sincerely,

A handwritten signature in purple ink that reads "Kristy Shirley".

Kristy Shirley, CIP, Research Compliance Administrator

For more information regarding IRB Office submissions and guidelines, please consult [http://www.ndsu.edu/research/integrity\\_compliance/irb/](http://www.ndsu.edu/research/integrity_compliance/irb/). This Institution has an approved FederalWide Assurance with the Department of Health and Human Services: FWA00002439.

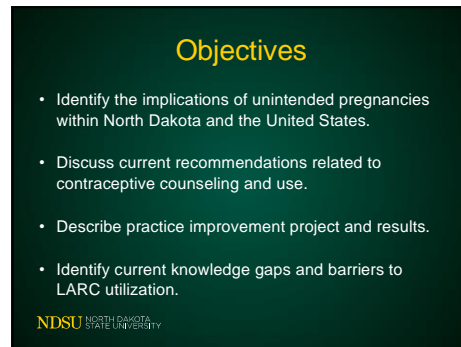
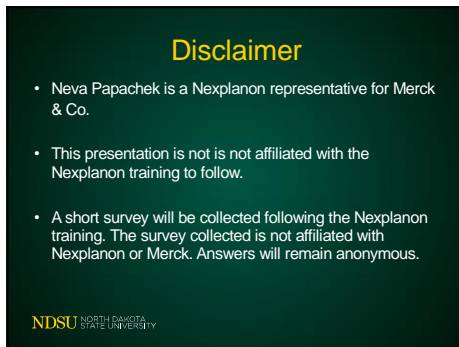
### INSTITUTIONAL REVIEW BOARD

NDSU Dept 4000 | PO Box 6050 | Fargo ND 58108-6050 | 701.231.8995 | Fax 701.231.8098 | [ndsu.edu/irb](http://ndsu.edu/irb)

Shipping address: Research 1, 1735 NDSU Research Park Drive, Fargo ND 58102

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## APPENDIX E. LARC TRAINING PRESENTATION







## Summary

- CDC, WHO, ACOG, and AAP all recommend LARCs as the most effective, first-line option.
- Contraceptive counseling in the tiered-effectiveness approach should be utilized.
- Knowledge gaps and barriers to LARC utilization continue to exist.
- Hands-on training and mentorships within the clinic may increase utilization.

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# EXECUTIVE SUMMARY

## Understanding provider knowledge and awareness about long-acting reversible contraceptives

### DEFINITIONS:

Long-acting Reversible Contraceptives: includes intrauterine devices (IUD), both hormonal and non-hormonal options, and subcutaneous hormonal implants

Unintended Pregnancy: a pregnancy that is mistimed or unwanted

### UNINTENDED PREGNANCY STATISTICS:

- In the United States, approximately 2.8 million pregnancies (45%) are unintended, resulting in 21.0 billion in public expenditures
- In North Dakota, approximately 5,000 pregnancies (49%) are unintended, resulting in 21.0 billion in public expenditures
- In North Dakota, approximately 17% of unintended pregnancies result in an abortion

### PROJECT AIM:

- To understand and improve nurse practitioners' knowledge and awareness about long-acting reversible contraceptives

### Background

Unintended pregnancies are a public health challenge within the United States. Decreasing unintended pregnancies is a national priority addressed in Healthy People 2020 and defined as any pregnancy which is mistimed or unwanted. The United States has higher rates of unintended pregnancies and abortions than many other developed countries.

Unintended pregnancies have individual, family, and societal implications. An unintended pregnancy has been associated with many negative health outcomes, including delayed prenatal care, maternal depression, decreased likelihood of breastfeeding, and increased risk of physical violence. Following an unintended birth, a mother is less likely to graduate high school and college, earn less than those who delay childbearing, and require federal assistance.

Approximately half of the unintended pregnancies across the United States occur due to not utilizing contraception or contraception misuse. Long-acting reversible contraceptives (LARCs) are highly effective methods yet underutilized within the United States. LARCs are considered a safe, non-user dependent form of contraception.

### Project Summary

Project interventions consisted of collection of an electronic questionnaire and educational hand-on training session. The comprehensive questionnaire was sent electronically to healthcare providers across Minnesota and North Dakota with the goal to assess the provider's knowledge, training, beliefs, and interests related to LARC utilization. The training session consisted of an educational presentation followed by an insertion and removal training session for one specific LARC method.

## RESPONSE:

- 147 Valid Responses
- 98% Nurse Practitioners

## RESULTS:

### Knowledge gaps identified:

- **Recommendations for LARC in co-existing condition** - Providers possessed uncertainty with many of the conditions demonstrated by selection of “unsure”
- **LARC eligibility** - Over 40% of providers reported “unsure” or “no” to recommending a LARC to women who were immediate postpartum, post-abortion, history of STI in the past 2 years, history of ectopic pregnancy, and history of PID; all conditions being a 1 or 2 on MEC guidelines and not a contraindication to LARC use.
- **Safety concerns** - Elevated safety concerns with uterine perforation, expulsion, STI, PID, and change in bleeding pattern being the highest concerns.

### Barriers to LARC Utilization:

Lack of LARC training, lack of comfort with counseling, frequency of LARC discussion, contraceptive counseling approach, and patient preference.

### Training Session:

100% of providers reported plan to incorporate tiered-effectiveness counseling and insert LARCs in their practice

## Recommendations

Recommendations include further development and implementation of education to target the knowledge gaps and barriers. Further hands-on training opportunities with supplemental contraceptive counseling education should be offered. The post-training survey demonstrated providers plan to incorporate both tiered-effectiveness counseling and insertion of LARCs in their practice. Additional training opportunities within multiple clinic sites may increase participation due to convenience. Training opportunities should incorporate both, IUD and implant methods, to increase the providers’ ability to offer comprehensive contraception services at each clinical site. The integration of comprehensive contraceptive education should be incorporated into medical school, nurse practitioner, and physician assistant programs. Furthermore, incorporation of patient education throughout medical facilities is recommended.

## Implications for Practice

Many implications exist for advanced practice nursing in regards to LARC utilization. The focus of healthcare in the United States has shifted to preventative medicine. With the new emphasis being placed on primary care, nurse practitioners are the front-line providers to delivering comprehensive family planning services. Nurse practitioners providing primary care should possess comprehensive knowledge of all forms of contraception and ideally be trained to insert LARC methods. Nurse practitioners trained on the insertion and removal of LARC methods can serve as mentors to other providers in the clinic, including physicians, physician assistants, and fellow nurse practitioners. Nurse practitioners providing and promoting evidence-based care leads to better patient outcomes and demonstrates leadership.

## Conclusion

Unintended pregnancies have immediate and life-long implications. Nurse practitioners play an integral role in providing comprehensive contraceptive services to all females with child bearing potential. Increasing the percentage of women aged 15 to 44 years that adopt or continue use of the most effective method of contraception is an objective of Health People 2020 (HHS, 2018). Nurse practitioners within all setting and specialties must be knowledgeable about the different forms of contraception along with the efficacy, safety, and side effect profile of each method. Nurse practitioner may not all be trained to insert LARC methods; appropriate and timely referrals assist with increasing LARC utilization and decreasing unintended pregnancies. Over time, the adoption of the LARCs by healthcare providers and patients may decrease infant and maternal morbidity and mortality rates leading to a decrease in healthcare costs for the United States.