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Analysis of Long-Acting Reversible Contraception (LARC) Implantation and Extraction among Female Sailors and Marines

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Objective:

The Navy and Marine Corps Public Health Center seeks to obtain data on the frequency of Long-Acting Reversible Contraception (LARC) placement and extractions in the female enlisted recruit population, with a particular interest in assessing what proportion of LARC recipients continued using the device for longer than 12 months. Reasons for removal and complication data, if available, will also be reviewed and tabulated.

Broadly speaking, the purpose of this evaluation is to analyze the prevalence of LARC usage among female recruits and to identify possible opportunities to improve LARC counseling of prospective recipients. The use of LARC over other contraceptive methods may prove to be an important resource in reducing the rate of unplanned pregnancies in the female enlisted population.

The NMCPHC Health Analysis Department provides assistance with data collection, analyses, and reporting of population-based descriptive statistics.

Background:

In 2008, only one of three (36%) surveyed enlisted female sailors reported that their last pregnancy while in the Navy was “planned”. Most of these women (69%) were using no form of birth control at the time they became pregnant. That survey found that over half of enlisted women were unmarried when their child was born, and there were approximately 6,000 active duty Navy single mothers (Uriell et al, 2008).¹ Navy parenting and pregnancy surveys conducted biennially since 1988 have reported consistently high unplanned pregnancy rates. The national Healthy People 2020 objective is to increase the proportion of pregnancies that are intended to at least 56% (Department of Health and Human Services 2011).² The 2005

¹Uriell, Z. (2008). Unpublished data based on Results of the 2008 Pregnancy and Parenthood Survey. Navy Personnel Research, Studies, & Technology, Millington TN.

²DHHS (2011) Healthy people 2010. Objective FP-1. Accessed 20 Mar 2012:
<http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=13>

DoD Survey of Health Related Behaviors Among Military Members found that about 1 of 5 female marines and 1 of 7 female sailors aged 21-25 reported having an unplanned pregnancy in the previous 12 months.³

A recently published document from the American College of Obstetricians and Gynecologists (ACOG) states that “the most effective methods of reversible contraception are the so-called long-acting reversible contraceptives, intrauterine devices and implants.” The duration of action for LARC devices is long, ranging from 3 to 10 years. However, they are infrequently used in the United States. ACOG further notes that “short-acting methods, specifically oral contraceptives and condoms, are by far the most commonly used reversible methods. A shift from the use of short-acting methods to long-acting reversible contraceptive methods could help reduce the high rate of unintended pregnancy in the United States.”⁴

Methods:

Source data were obtained from the Military Health System (MHS) Mart (M2) database in May and June of 2012. Data were specifically queried from the Direct Care outpatient tables (Direct Care data is derived from electronic medical records information, collected within Military Treatment Facilities). All analyses were performed using SAS v9.2 and Microsoft Excel 2007.

The following criteria were used to determine what constitutes a LARC insertion, surveillance, or removal case:

- LARC Insertion Population: The population of interest for LARC insertions is female active duty Navy or Marine recruits, with a rank of E1-E4, who received insertion of a LARC device at either the Great Lakes locations or the NH Beaufort/Parris Island location. The time interval under evaluation is Fiscal Year 2010 (FY2010) to present. The definition of a LARC device was inclusive of both subdermal contraceptive capsule devices and intrauterine devices. To be included in the population under study, the patient must have received a diagnosis or procedure code indicating that a LARC device was inserted (see Appendix A for the relevant codes that were queried).
- LARC Cohort Follow-Up: The medical records of the insertion population were evaluated from time of insertion to the present date. LARC-related encounters (such as checking, removals, complications, and reinsertions) were tabulated. To be included in the cohort population, the LARC encounter must have been conducted at a Military Treatment Facility (MTF).
- LARC Removals: To assess the rate of removals, those who received an insertion of a LARC device at either recruit location were followed to see if the device was later removed (at any MTF location). Time between insertion and removal was noted and tabulated. The frequency of complications or other co-occurring problems was recorded if available.

For the insertion population, data were tabulated and stratified by age group, facility location, and type of procedure/diagnosis.

³ Bray R, Hourani L, Rae Olmsted K, Witt M, Brown J, Pemberton M, Marsden M, Marriott B, Scheffler S, Vandermaas-Peeler R, Weimer B, Calvin S, Bradshaw M, Close K, Hayden (2006). 2005 Department of Defense (DoD) Survey of Health Related Behaviors Among Military Personnel. Prepared for the Assistant Secretary of Defense (Health Affairs) by RTI International, Research Triangle Park, North Carolina

⁴ Espey, Eve MD, MPH; Ogburn, Tony MD. Long-Acting Reversible Contraceptives: Intrauterine Devices and the Contraceptive Implant
Obstetrics & Gynecology: March 2011 - Volume 117 - Issue 3 - pp 705-719. Accessed on May 28, 2012:

http://journals.lww.com/greenjournal/Abstract/2011/03000/Long_Acting_Reversible_Contraceptives_.25.aspx

According to the subject matter experts that were consulted for these analyses, the reasons for a LARC device removal are generally not coded, but sometimes recorded in the providers' notes sections, which were not available in the records queried for this analysis.

Results:

Between FY2010 (October 2009) to FY2012FM9 (June 2012), 2260 encounters (visits) were conducted for some type of LARC procedure at the two recruit locations. Among these encounter visits, 1,763 encounters were for a LARC device insertion, within a population of 1,721 unique people. Descriptive statistics about the population of individuals are listed below.

Age Distribution

Table 1: Age Distribution of Female recruits at NHC Great Lakes and NH Beaufort who received insertion of a LARC device (FY2010 - June 2012) N=1,721

The following table (Table 1) shows the age distribution of those female recruits/enlisted sailors and marines who received a LARC device at a recruit location.

Age Range	Number	Percent
17	16	0.9%
18-24	1,554	90.3%
25-34	149	8.7%
35-44	2	0.1%
Total	1,721	100%

Source M2; June 2012

Location Distribution

Table 2: Location Distribution of Female recruits at NHC Great Lakes and NH Beaufort who received insertion of a LARC device (FY2010-June 2012) N=1,721

Among those who received insertion of a LARC device, the following table shows the geographic location distribution.

Location	Number	Percent
NH Beaufort*	341	19.8%
FHCC-Formerly NHC Great Lakes	1,380	80.2%
Totals	1,721	100%

*Per the Subject Matter Expert at Beaufort, IUDs are not placed in boot camp recruits at this location, only subdermal implants (Implanon), and only since May of 2011.

Source M2; June 2012

LARC Post-Insertion Data

Following this same insertion cohort that received a LARC device at either Great Lakes or Beaufort, these patients were evaluated over time, looking at all MTFs (based on the presumption that the recruits were sent to numerous different locations after the completion of boot camp, and could have received follow-up care at any MTF). Among this population, 388 recruits received post-insertion care for their LARC device (i.e. the LARC device either being checked, removed, or experiencing a complication). Among these 388 unique people, the following table shows the distribution of LARC care that was provided. Please note that subjects could have more than one type of care event recorded.

Table 3: Type of LARC care received by recruits post-insertion (FY2010-June 2012) N=388

Type of LARC Care	Number of people who received care	Among those who received LARC care post insertion, type of care by percentage
Checking IUD	140	36.1%
Checking subdermal device	102	26.3%
Removal of IUD	136	35.1%
Complication of IUD	18	4.6%
Removal of subdermal device	88	22.7%

Source M2: June 2012; No complications of subdermal devices were recorded.

Percentage of Insertions that were Continued (Among Unique People)

As noted previously, 1,721* female recruits received insertion of a LARC device at either Great Lakes or Parris Island/Beaufort. Among those who received an insertion, the following table shows the type of device, and how many continued to be in use during the 2.5 year interval under study.

Table 4: IUDs and Subdermal devices that were in continuous use (no record of removal at any MTF)

Type of LARC device that was inserted	Number of people with a device Inserted	Number of people who had continuous use of the device (no record of removal)	Percent continued use post-insertion, by unique people
IUD	737	601	81.5%
Subdermal device	1004	916	91.2%
Total LARC Removals post-insertion	1,741*	1517	87.1%

*For 20 females, both an IUD and a subdermal device were recorded as being implanted; it is unknown as to whether this was a coding error, or if one device was removed and replaced with the other during the boot camp period.

For the next two tables, a continuation rate was calculated to establish a measure of how long these devices were in use. For the purposes of these analyses, “continuation” means no record of device removal within 12 months post-insertion (and conversely, “non-continuation” means there was a record of device removal less than 12 months post-insertion).

IUD Continuation Timeframes

Table 5: Sub-population: IUD continuations

737 female recruits received insertion of an IUD device. Within the timeframe under study, there were 136 patients where there was a recorded visit where an IUD was removed. Insertion and removal dates were available for 121* of these patients. Dates were evaluated to ascertain the time interval between insertion and removal; the interval of interest was whether the patients had continued use of the IUD for greater than 12 months, post-insertion.

Number of IUDs	Number	Percentage
Continuation (no record of removal during the first 12 months, post-insertion)	652	88.5%
Non-continuation (a record of removal less than 12 months post-insertion)	85	11.5%

* Original insertion date either not recorded in the MTF records or insertion occurred outside of (or before) patient was enrolled in military care
Source M2: June 2012

Subdermal Device Continuation Timeframes

Table 6: Sub-population: Subdermal continuations

1,004 female recruits received insertion of a subdermal device. Within the timeframe under study, 88 patients had a recorded visit where a subdermal device was removed. Among those recorded visits where a subdermal device was removed (n=88), insertion and removal dates were available for 78* of these patients. Dates were evaluated to ascertain the time interval between insertion and removal; the interval of interest was whether the patients had continued use of the subdermal device for greater than 12 months, post-insertion.

Number of Subdermal devices	Number	Percentage
Continuation (no record of removal at 12 months post-insertion)	946	94.2%
Non-continuation (a record of removal less than 12 months post-insertion)	58	5.8%

* Original insertion data either not recorded in the MTF records or insertion occurred outside of (or before) patient was enrolled in military care
Source M2: June 2012

IUD Devices that had complications

Sub-population: IUD complications

Among the IUD insertion population (n=737), bleeding was coded and recorded as a complication in 18 people. Among those 18 people, 7 had the IUD removed (i.e. 38.9% of those who experienced bleeding with their IUD chose to have the IUD removed). As noted previously, specific complication data is often recorded in the provider's notes, which were not available for these analyses.

Limitations

Due to limitations in the M2 database, all enlisted personnel are grouped into one category, E1 to E4. Therefore, it is unknown within the population under study what the specific rank of each individual was within the E1-E4 range.

The data available in the M2 database does not contain the specific brand of IUD or subdermal device that was used (e.g. Implanon versus Nexplanon, ParaGard versus Mirena, etc.); therefore, LARC devices were recorded in the broader categories as either intrauterine (IUD) or subdermal.

Per the subject matter experts (SMEs) that were consulted for this project, irregular bleeding, headaches, and depression are the most common reasons that a patient opts to have their LARC device extracted. As noted previously in this report, the reasons for a LARC device removal are generally not coded within the medical record, but sometimes recorded in the providers' notes sections, which were not available in the records queried for this analysis.

Additionally, some of the codes used for LARC devices lack specificity; for example, the definition for V25.42 is "checking, reinsertion, or removal of an IUD". If V25.42 is recorded without an additional procedure code to provide further clarification, it is unknown what type of event took place. For this report, insertion cases and removal cases were only included in the data tables if definitive procedure codes were present as qualifiers.

At the Beaufort recruit location, only subdermal devices are implanted (no IUDs); therefore, the data for IUDs may be skewed in either direction due to underrepresentation in the sample.

For 15 of the IUD removal cases, and for 10 of the subdermal removal cases, complete dates were not available to ascertain the interval between insertion and removal of a LARC device. Therefore the rates that were calculated in tables 5 and 6 may be somewhat over- or under-represented for this population.

The population represented within this report represents the timeframe from October 2009 to June of 2012; it is possible that the rates within this report would differ if a longer timeframe was evaluated.

The data presented here represent outpatient encounters at MTFs; inpatient, in-theater and shipboard data were not included in these analyses.

Appendix A: ICD-9* V-Codes and CPT codes Used in the Analyses

Intrauterine devices

V25.1 = 'insertion of intrauterine device';

V25.11 = 'insertion of intrauterine device';

V25.12 = 'removal of IUD'

V25.42 = 'Checking, reinsertion, or removal of IUD';

99632 = 'Mechanical complication of IUD';

99665 = 'Infection/Inflammatory Reaction'

99676 = 'Other complications'

58300 = 'Insertion of IUD'

58301 = 'Removal of IUD'

Subdermal devices

V25.5 = 'Subdermal insertion';

V25.43 = 'Checking, reinsertion, or removal of subdermal'

11981 = 'Subdermal insertion'

11982 = 'Subdermal removal'

11983 = 'Subdermal removal with reinsertion';

11975 = 'Subdermal removal (old CPT code)';

11976 = 'Subdermal removal (old CPT code)';

11977 = 'Subdermal removal with reinsertion (old CPT code)';

*Based on the 2010 ICD-9 professional edition book