Contraceptive Failure Rates of Etonogestrel Subdermal Implants in Overweight and Obese Women
Financial Disclosures

• No financial conflicts of interest
Objectives

- Estimate the contraceptive failure rates of the ENG implant among overweight and obese women
- Compare failure rates with women of normal weight and women using intrauterine devices (IUDs)
Etonogestrel subdermal (Implanon) implant

- Introduced in 2006
- Approved for 3 years of use
- 4cm long, 2mm diameter
- 68mg etonogestrel

Hatcher et. al. Contraceptive Technology. 2009
Implants are among the most effective forms of contraception.

First Year Failure Rates (%)

- No Contraception
- Spermicides
- Condom
- Pill/Patch/Ring
- Injectable (DMPA)
- IUD-Cu T
- IUD-LNG
- Implant

Hatcher et. al. Contraceptive Technology. 2009
Pregnancy in the United States

- 6 million pregnancies per year in the US
- Half are unintended
- 60% of unintended pregnancies report contraception used that month
- Contraception requires strict adherence/compliance
Obesity in the United States

- Increased morbidity
- Pregnancy complications
Controversy

- Failure rate for implant: 0 per 100 women-years of use

- Clinical trials excluded subjects >130% of their ideal body weight
Hypothesis

- There is no significant difference in failure rates by body mass index (BMI) status among implant users as compared to the reference group of IUD users
The Contraceptive CHOICE Project

- Prospective cohort study
- 9,256 women
- Ages 14-45
- St. Louis region
- Long-acting reversible contraceptives
- Reduce unintended pregnancies
Study Subject Timeline

Survey

STI screen

Month

0  3  6  9  12  15  18  21  24  27  30  33  36
enrollment
Recruitment

• August 2007 to October 2010

• Analysis on 8,445 women

• Phone follow-up rates:
  ○ 98% at 6 months
  ○ 95% at 12 months
  ○ 88% at 24 months
  ○ > 80% at 36 months
Secondary Analysis

- **BMI at baseline visit**
  - Normal weight: BMI 18.5-24.9
  - Overweight: BMI 25-29.9
  - Obese: BMI 30 or higher

- **Missed menses and possible pregnancies**
  - Method use at the time of conception
  - Date of last menstrual period
  - Plans for pregnancy (intended?)

- **Contraceptive method failure**
Data Analysis

- Demographic characteristics
  - Means and standard deviations
  - Frequency and percentage

- Implant vs. IUD
  - Continuous variables → Student’s t-test
  - Categorical variable → Chi square test
  - Contraceptive failure rates → Kaplan-Meier survival curves and log-rank tests
Sample Size Calculation

- Post-hoc calculation

- A sample size of 1,168 participants

- Greater than 80% power to detect a difference in contraceptive failure rates of:
  - 0.5% in the normal weight group
  - to 0.8% of the overweight group
  - To 3% in the obese group
Demographics of Implant Users

- Significantly more likely to be:
  - Younger
  - Black
  - Never married
  - Lower educational level
  - Lower income
  - Lower parity
BMI Distribution

IUD users
4,200 (50%)

35% 38% 27%

Implant users
1,168 (14%)

35% 37% 28%

- normal weight (BMI 18.5-24.9)
- overweight (BMI 25-29.9)
- obese (BMI >30)
Demographics of Overweight and Obese Participants

- Significantly more likely to be:
  - Older
  - Black
  - Married
  - Lower educational level
  - Lower income
  - Greater parity
Unintended Pregnancies- IUD users

- 5,985 women-years of IUD use
  - Normal weight: 5 unintended pregnancies
  - Overweight: 0 unintended pregnancies
  - Obese: 7 unintended pregnancies
1,377 women-years of implant use

- Normal weight: 0 unintended pregnancies
- Overweight: 0 unintended pregnancies
- Obese: 1 unintended pregnancies
  - Participant BMI 30.7
  - Reported pregnancy 4 days after insertion
Strengths

- CHOICE Project is large prospective cohort study
- Low rate of loss of follow-up through 36 months
- Diverse group of US women
- Wide BMI range
Limitations

- Non-randomization of study participants
- Convenience sample
- Must initiate new contraceptive method
- Underpowered to show small differences
Conclusion

- Efficacy of the implant does not vary based on BMI
- Both implant and IUD have very low failure rates
- Clinicians can recommend implants for contraception to women of any weight
Acknowledgments

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- The Doris Duke Charitable Foundation
- Association of Reproductive Health Professionals
Thank you

ANY QUESTIONS?

THE CONTRACEPTIVE CHOICE PROJECT
### Baseline Demographics (N=8,445)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>IUDs (N=4200)</th>
<th>Implant (N=1168)</th>
<th>p-value&lt;sup&gt;1&lt;/sup&gt;</th>
<th>p-value&lt;sup&gt;2&lt;/sup&gt;</th>
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<tbody>
<tr>
<td><strong>Age (Mean, SD)</strong></td>
<td></td>
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<tr>
<td>Normal Weight (N=1584)</td>
<td>25.3 (6)</td>
<td>21.5 (5)</td>
<td>&lt;0.01</td>
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<tr>
<td>Overweight (N=1149)</td>
<td>26.5 (6)</td>
<td>23.1 (6)</td>
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<tr>
<td>Obese (N=1467)</td>
<td>27.5 (6)</td>
<td>24.2 (6)</td>
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<td>&lt;0.01</td>
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<tr>
<td><strong>Race</strong></td>
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<tr>
<td>Black (N=471)</td>
<td>471 (30)</td>
<td>218 (51)</td>
<td>&lt;0.01</td>
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<tr>
<td>White (N=980)</td>
<td>980 (62)</td>
<td>174 (40)</td>
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<tr>
<td>Others (N=125)</td>
<td>125 (8)</td>
<td>40 (9)</td>
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<tr>
<td><strong>Marital Status</strong></td>
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<tr>
<td>Never married</td>
<td>918 (58)</td>
<td>322 (74)</td>
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<td>Cohabiting</td>
<td>345 (22)</td>
<td>78 (18)</td>
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<tr>
<td>Married</td>
<td>219 (14)</td>
<td>23 (5)</td>
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<td>Divorced/Separated/Widowed</td>
<td>101 (6)</td>
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<td><strong>Education</strong></td>
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<td>≤HS (N=1584)</td>
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<td>232 (53)</td>
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<td>≥Some college</td>
<td>1152 (73)</td>
<td>706 (34)</td>
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<td><strong>Receives public assistance</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
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<tr>
<td>No (N=1584)</td>
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<td>303 (69)</td>
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<tr>
<td>Yes</td>
<td>428 (27)</td>
<td>136 (31)</td>
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<td><strong>Parity</strong></td>
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<td>0</td>
<td>838 (53)</td>
<td>279 (64)</td>
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<td>1</td>
<td>381 (24)</td>
<td>91 (21)</td>
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<tr>
<td>2+</td>
<td>365 (23)</td>
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