

# Team 111 - Birth control

More effective matching of birth control to minimize switching & side effects

# Most women are dissatisfied with their birth control

- **54.3% of women** in U.S. are currently using contraception
  - nearly 90% of women have used contraception at some point in their lives
- **52% not completely satisfied** with their birth control **due to side effects**
  - most women **switch 2.7 times**
  - **Side effects have a large impact** on daily life: score 57/100

## Typical Side Effects:



## Serious side effects:

- Bone density loss
- Increased cervical & breast cancer risk
- Increased risk of stroke & blood clots

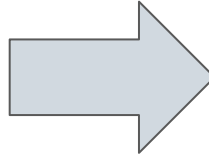
# Better birth control matching can help solve this

## Current standard of care:

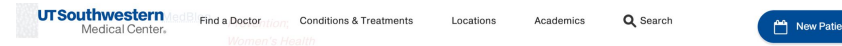
U.S. Medical Eligibility Criteria (USMEC):

Provides recommendations on which contraceptive methods are safe based on **medical history contraindications**

- Migraines with aura
- Hypertension
- Smoking
- Reproductive goals
- Previously given birth
- Age

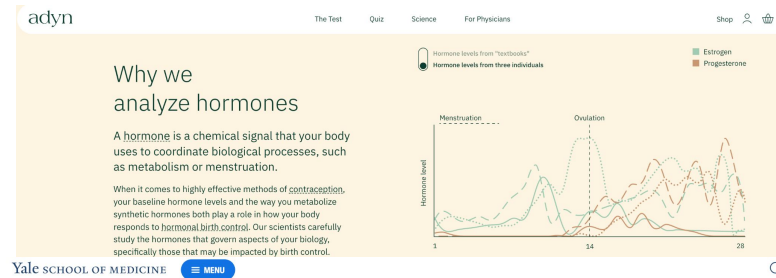


## Leaves room for personalization:



### Personalizing birth control to minimize health risks

July 25, 2022



Yale School of Medicine

MENU

IN DEPTH

### Analyzing Genetics May Lead to Better Contraceptive Experiences for Women

By Saul Asiel Flores

February 28, 2025





# Utilizing AI/ ML

## Input

- Demographic (age, ethnicity)
- History (postpartum)
- Physical exam (blood pressure, BMI)
- Paraclinical (echographic)
- Feedback from previous trials and errors (side effects)
- Patient's personal preference
- Insurance
- Genetic?

## Classifications Model

- **Regularized Logistic Regression?**
- **Random Forest?**
- **Artificial Neural Network?**

## Output

**Birth control recommendation**  
(first 03 maybe)  
Explanation of the recommendation

# A. Technical Feasibility

## Data availability

- Data collection:
- Collect short digital questionnaires: side-effect scores and satisfaction of patient

## A small app connects to the EHR for clinicians to use

Embedded ML model via **SMART-on-FHIR** app



## Ethical aspect consideration (protect user privacy data)

The app sends only de-identified features to the model

- Remove name, address, MRN, phone number.

## B. Model fitting success (Evaluation Measure)

### 1. Did the patient stay on it? Best Fit

If user keep using the birth control method for 6–12 months = good fit

If they stop or switch = poor fit

### 2. Side-effect score

Patients report how bad the side effects were (0–100).

Lower score = better fit indicate better satisfaction

### 3. Satisfaction rating

Higher rating = better fit.

### Model

**Deployment:** if a patient stayed on their birth control or switched

Model fitting= how well the birth-control method works **for that specific patient user input**

## C. How Clinicians Use the Model

- Review **3 recommended birth control methods** for this specific patient
- Displays **expected side effects** and **probability of switching**
  - Help clinicians understand Cause & Effect: “**Why**” explanation
- Clinician reviews options and decides what to prescribe
- Clinician can accept, modify, or ignore the suggestion





# Business: The birth control market is large and growing

- Market Reach: \$17.3B → \$26.6B (2023-2035) Hormonal Contraceptives Market
- Addressable Market
  - 1.1B women need family planning
  - 164M with unmet needs
  - 874M using modern methods
- Our Target Initial
  - US market (90% usage rate) 45M women
- Revenue Generation Streams:
  - Electronic Health Record - Subscription -> Per Clinician Per Month
  - Hospital Systems -> License AI Model

## **Team 111 - Birth control:**

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# Competitive Analysis

Feature	Our Solution	Dama Health	Reya Health	PP Method Matcher
Matching	✓ Advanced ML	⚠ Basic	✓ Algorithm	✗ Simple quiz
No Genetic Test	✓	✗ Required	✓	✓
Real-time Side Effect Data	✓ Crowdsourced	✗	✗	✗
B2B Integration	✓ API-first	✗	✗	⚠ Limited

# Solution



```
{
  "patient_id": "anonymous_12345",
  "demographics": {
    "age": 28,
    "bmi": 24.5,
    "smoker": false
  },
  "medical_history": {
    "migraines": true,
    "migraine_with_aura": false,
    "blood_clots": false,
    "diabetes": false,
    "hypertension": false,
    "depression": true
  },
  "current_medications": [
    "sertraline 50mg (SSRI)"
  ],
  "contraceptive_history": [
    {
      "method": "combined_oral_pill",
      "start_date": "2022-01",
      "end_date": "2024-10",
      "discontinuation_reason": "mood_changes",
      "side_effects": ["irritability", "weight_gain"]
    }
  ],
  "parity": 0,
  "pregnancies": 0
}
```

## Your Birth Control Match Results

🏆 #1: Hormonal IUD (Mirena/Kyleena)

Match Score: 92%

★ Best for your priorities

Why it fits:

- Set for 5 years (high convenience)
- May stop periods
- No estrogen (safer for migraines)

Your risks:

- Mood changes: 15% (LOW)
- Weight gain: 20% (LOW)

[Learn More] [Talk to Provider]

#2: Implant - 85%

#3: Mini-Pill - 78%