

# Fertility Protocol

Tracking and monitoring hormones with Mira helps patients identify their fertility window and pinpoint ovulation to optimize intercourse timing. It also provides insight into hormonal patterns, enabling more effective treatment timing, and visualizes progress, which enhances patient's engagement and compliance. Additionally, it supports individualized treatment plans.

## Using Mira for hormone monitoring assists with:

### Identify:

1. Identify the full fertile window and accurately pinpointing the LH surge and suspected ovulation to time intercourse effectively.
2. Accurately track and document essential elements of the menstrual cycle:
  - a. Period dates
  - b. LH surge and suspected day of ovulation
  - c. Luteal phase length
  - d. Cycle length

### Assess and Monitor:

1. Assess the underlying hormone pattern for abnormalities.
2. Monitor PdG levels to verify that ovulation has occurred and assess whether these levels are sufficiently optimized to support successful implantation.
3. Monitor and trend FSH levels to assess ovarian function

### Adjust and Intervene:

1. Schedule lab tests at specific points in the menstrual cycle, such as on cycle day 3 or 7 days post-ovulation
2. Time interventions, imaging, or strategies and tracking the response to treatments such as ovulation induction with Clomid, Letrozole and even trigger shots.



Mira data is most useful for identifying overall patterns and trends rather than focusing on individual data points, as hormone levels can fluctuate frequently.

## Limitations:

1. Hormones measured in serum cannot be directly compared to urine metabolites, as they are assessed in different units and show correlation rather than direct equivalence. While these metabolites often fluctuate, a study has found that they generally correlate well with the overall serum hormone pattern. Urine metabolites measured with Mira cannot be used to determine serum levels.
2. Types of hormone supplementation that raise serum hormone levels will raise urine metabolites and therefore, will affect Mira data.
  - a. Oral progesterone tends to raise serum progesterone levels more than topical progesterone due to differences in absorption, metabolism, and distribution. Oral bio-identical progesterone supplementation may cause Mira PdG to reach the max threshold of 30.
  - b. A study has demonstrated that topical progesterone leads to slight increases in both serum progesterone levels and PdG excretion.
    - i. Although supplementing progesterone does not directly reduce estrogen levels, it can indirectly affect estrogen by stabilizing its effects within the body. In hormone therapy, supplementing progesterone is utilized to balance estrogen's impact and maintain hormonal equilibrium. To manage estrogen dominance, optimizing progesterone levels may be helpful. Mira results indicate help monitor these indirect effects on estrogen levels.
3. At this time Mira cannot be used to assess whether a specific dose of hormone such as progesterone is achieving the desired serum levels or to evaluate the absorption rate but providers have found Mira helpful to monitor response to HRT and indirect effects such as lowering estrogen levels.



Disclaimer: The information provided is based on the experiences and feedback of providers using Mira with their patients, rather than results from scientific research or studies. It serves as a guideline and should not be considered scientific proof.

## Testing Instructions

### 1. Sample Collection:

Use first morning urine for best results.

Wait at least 4 hours between voids. For later testing, hold urine for 4 hours and limit oral intake for 2 hours before testing.

Test at the same time each morning. **Limit fluid intake to less than 100 ml before bedtime and during the night.**

### 2. Dipping Method:

Dip the wand up to the "max" line for exactly 20 seconds.

### 3. Analyzing Process:

Apply and secure the cap.

Insert the capped wand into the analyzer.

Place the analyzer on a flat surface and do not move it. Analysis takes 16-21 minutes.

### 4. Urine Sample Storage:

Test your urine sample immediately and keep it until a successful result is obtained.

### 5. Equipment Storage:

Store the analyzer and wands in a cool, dry place. Avoid moisture, heat, or freezing.

## Testing Pattern:



*Regardless of the category encourage patients to begin testing immediately. It is not necessary to wait for the start of a new menstrual cycle.*

*Testing can be started on any day of the cycle except during the period.*

## **Regular/Ovulatory Cycles**

Test OVUM (FSH) daily or cycle day 3-6, as well during fertile window

**Option 1** Daily Testing: MAX (E3G, LH, PdG) wands daily starting on cycle day 6 until next menses.

**Option 2** Reduced Testing: MAX ( E3G, LH, PdG) wands daily during the fertile window and every other day during early follicular and luteal phase.

**Option 3** Cost Saving: PLUS (E3G, LH) wands daily or every other day starting on cycle day 6 until LH surge is identified. After the LH surge is identified switch to testing with MAX (E3G, LH, PdG) wands daily or every other day.

## **Irregular or long cycles**

Test OVUM (FSH) daily or cycle day 3-6 as well, as during the fertile window.



Trending FSH levels from cycle day 3-6 overtime can provide insight into reproductive health. When FSH and LH surge together it is more likely to be ovulatory.

**Option 1** Daily Testing: MAX (E3G, LH, PdG) wands daily starting on cycle day 6 until next menses.

**Option 2** Reduced Testing: MAX (E3G, LH, PdG) wands daily during fertile window and every other day during early follicular and luteal phase (for example. "gray zones" on Mira chart).

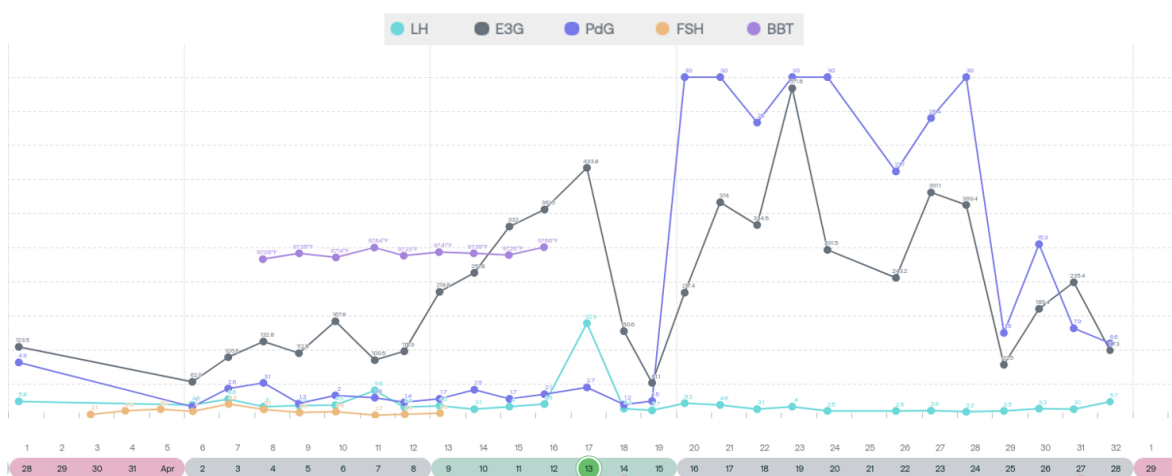
**Option 3** Cost Saving: PLUS (E3G, LH) wands daily or every other day starting on cycle day 6 until LH surge is identified. After the LH surge is identified switch to testing with MAX (E3G, LH, PdG) wands daily or every other day.



**Option 3 (cost saving) example:** PLUS (E3G and LH) wands until LH surge, MAX (E3G, LH, and PdG) after LH surge



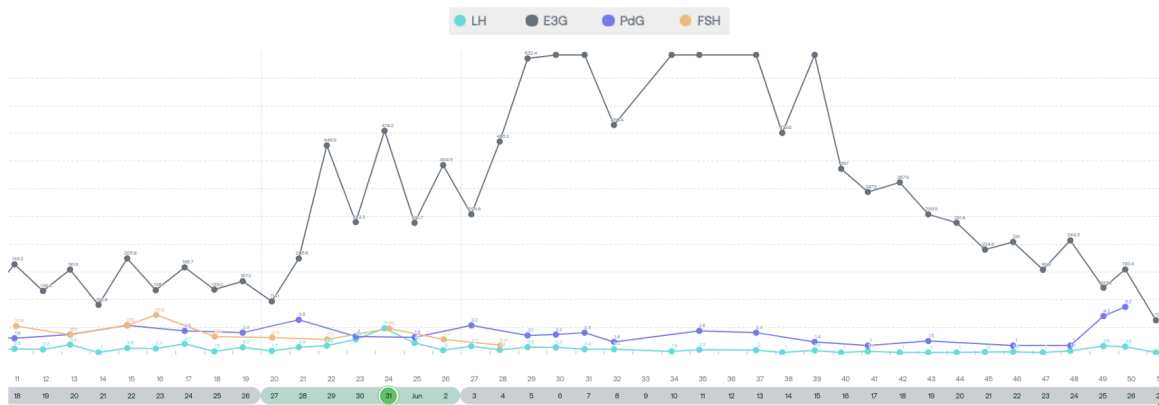
Ongoing testing during the luteal phase helps confirm ovulation through rising and sustained PdG levels and allows for monitoring E3G and PdG patterns.



**Example:** Testing during the luteal phase allowed the provider to identify abnormally high E3G in the luteal phase

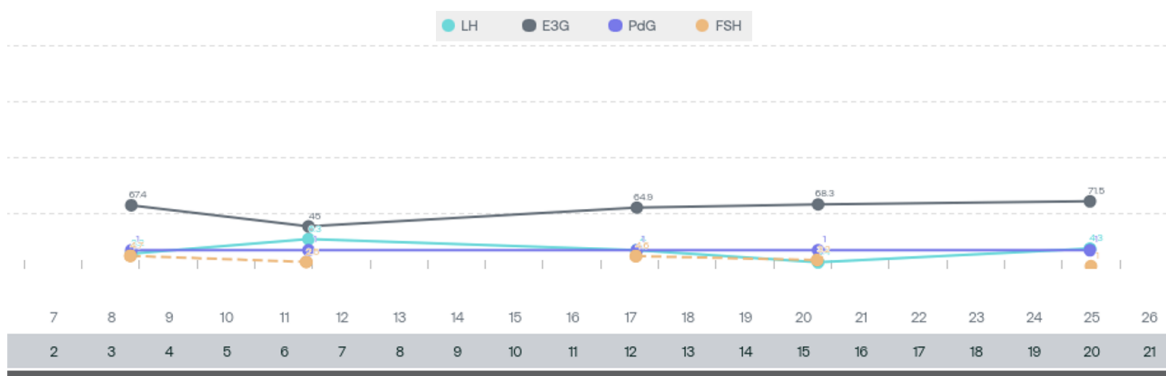
## Amenorrhea

## Option 1 Daily Testing: MAX wands daily



Example: Daily testing with MAX wands

## Option 2 Reduced Testing: MAX wands every other day or every third day



Reduced Testing example: Testing done at intervals using MAX wands

## Interpretation

[Click here](#) to download the interpretation guide.

## Special Considerations

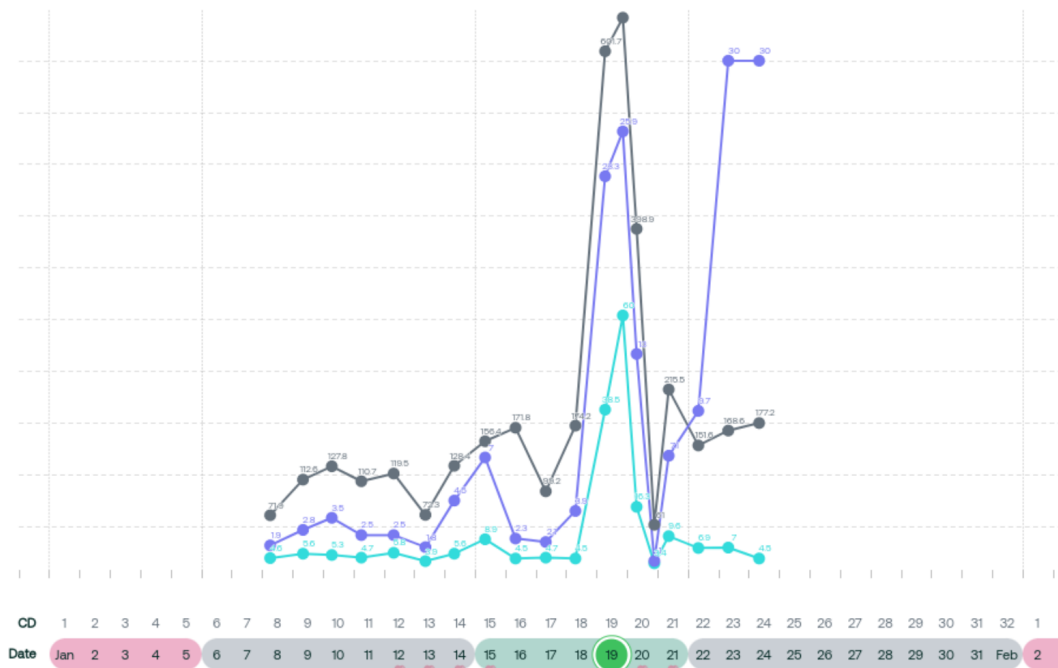
1. **Clomid** blocks estrogen receptors in the brain, prompting the pituitary gland to produce more FSH and LH, which in turn boosts estrogen levels. The rise in circulating estrogen can be evaluated through urine metabolites, which is reflected in Mira E3G levels. These levels are expected to increase and may peak at up to 640.
2. **Letrozole** blocks estrogen synthesis, reducing estrogen levels resulting in lower E3G levels during treatment. Once letrozole is stopped, estrogen

levels may rebound, potentially causing E3G levels to reach up to 640.

3. **Human chorionic gonadotropin (HCG)** injections, used as a trigger shot or luteal phase support, may increase Mira LH results because HCG cross-reacts with LH.

## Chart Examples:

1. 28 Female: Sub-optimal intercourse timing based on misconception of consistent ovulation on CD 14



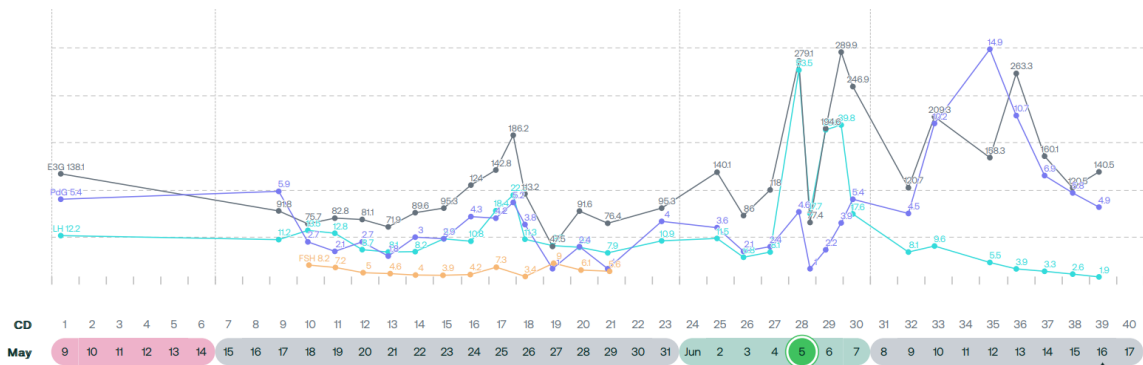
Mira Data Discovered:

LH surge on CD 19 and CD 20 (instead of CD 14 as patient thought)

Ovulation confirmed with elevated PdG levels

Luteal phase 12 days

2. 26 Female PCOS: Non-ovulatory LH surge



Mira Data Discovered:

LH surge on Cd 17 and CD 18.

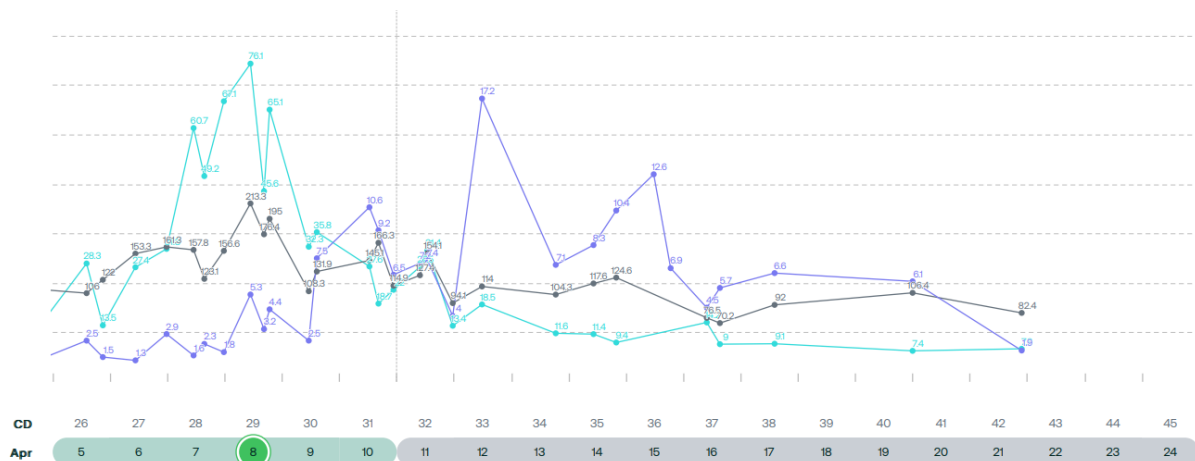
Suspicion for unsuccessful attempt due to lack of FSH and LH coordination. Determined to be non-ovulatory due to a lack of PdG change.

Second LH surge on CD 28-30 determined to be ovulatory due to PdG changes following the LH surge.



A lack of PdG rise after an LH surge likely represents an anovulatory cycle or sub-optimal ovulation

- 32 Female with history of irregular cycles and inability to conceive for 6 cycles, complicated by ileostomy due to severe Crohn's.



Mira Data Discovered:

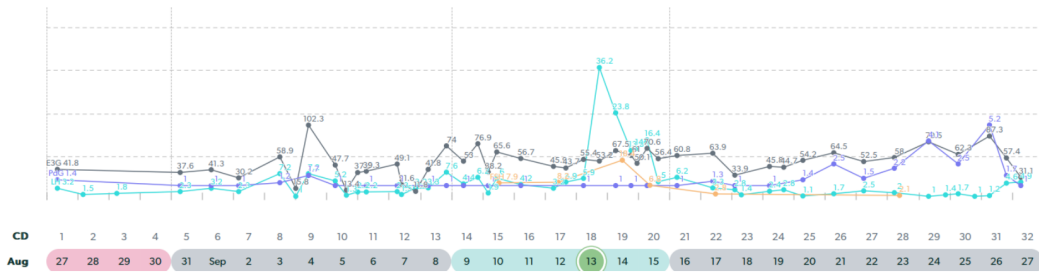
Extended follicular phase

Abnormal LH surge from CD 26-CD33 (8 days long)

Rising PdG levels confirms ovulatory event

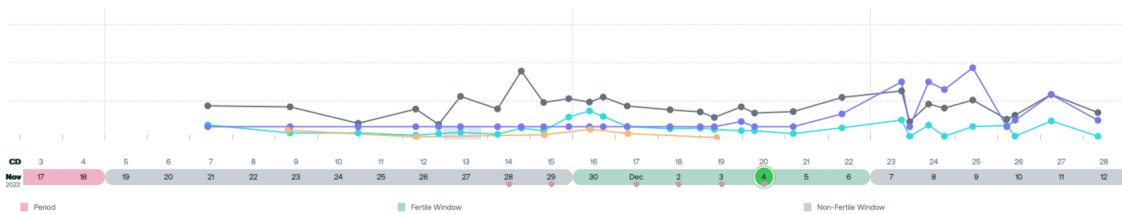
- 40 Female: Infertility for 1 year, low hormone levels





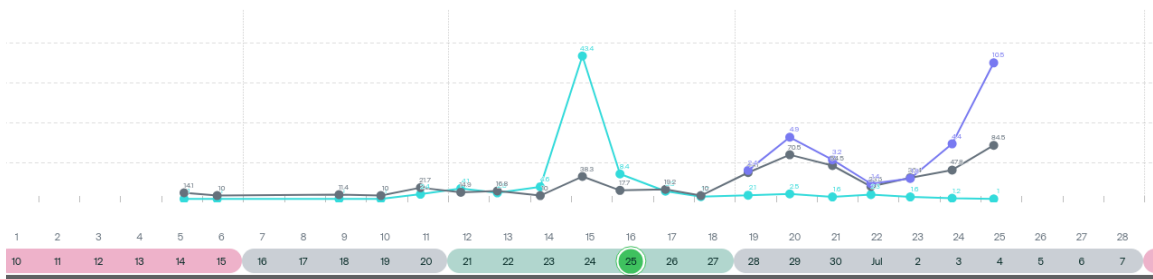
Mira Data Discovered:  
 Low E3G levels  
 Lack of effective rise in E3G before ovulation  
 Low PdG levels after LH surge

### 5. Hypothyroidism example:



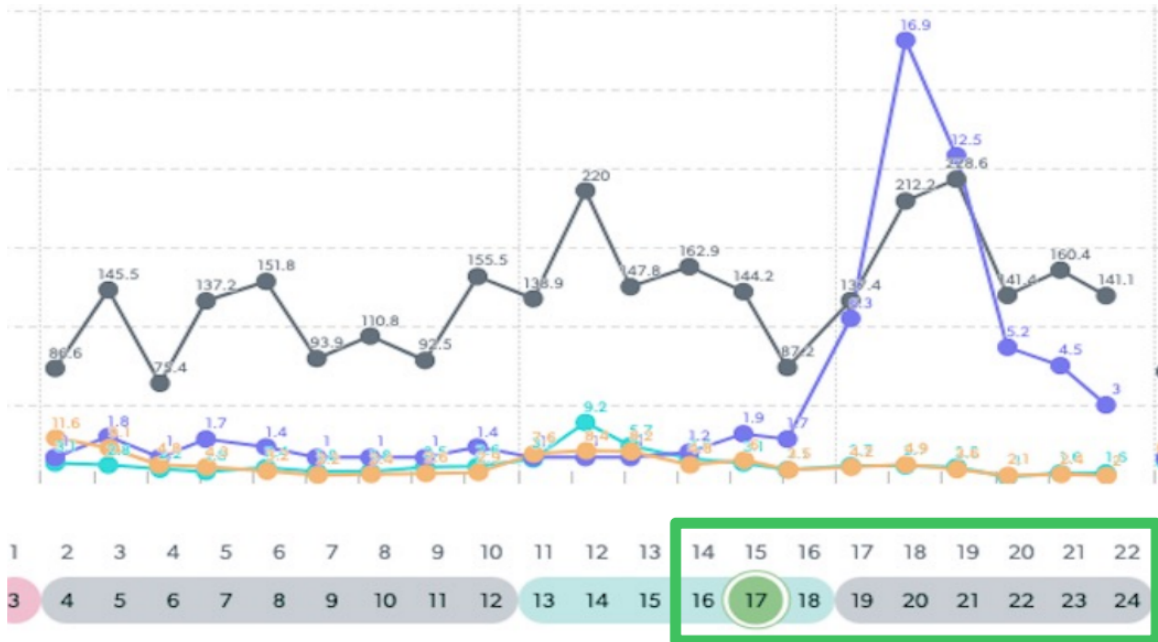
Mira Data Discovered:  
 Low and minimal E3G changes  
 Unsure if small LH surge on CD 16 triggered ovulation due to minimal PdG changes

### 6. 28 Female, tracking hormones prior to TTC, discovered abnormal hormone pattern



Mira Data Discovered:  
 Lack of E3G changes prior to LH surge  
 LH surge on CD 15  
 PdG changes confirms ovulatory event but PdG levels are low  
 Luteal phase 12 days

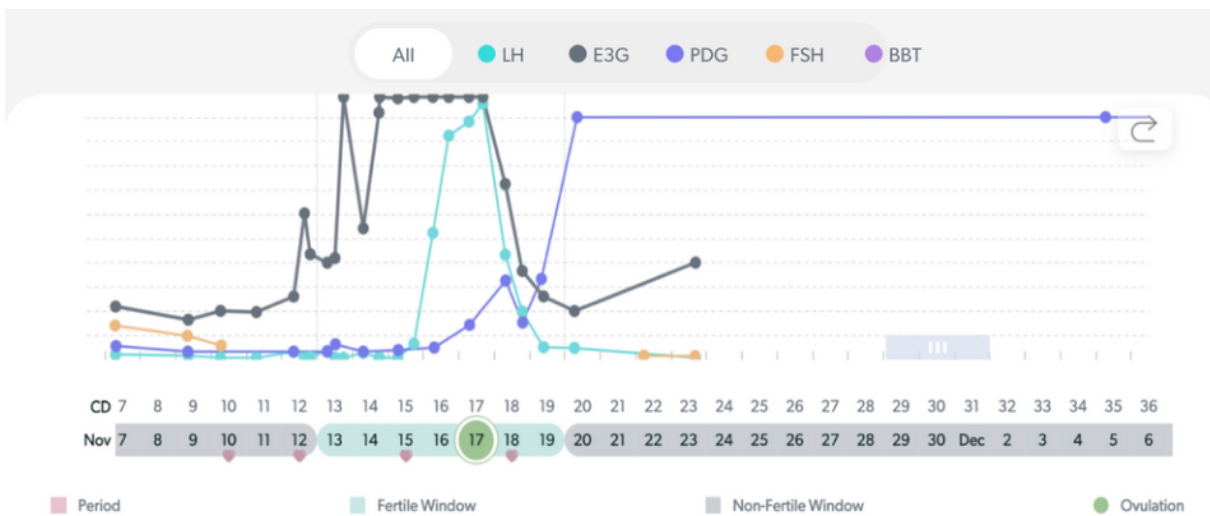
### 7. Short luteal phase example



Luteal phase is 9 days

Mira Data Discovered:  
 E3G does not follow expected pattern  
 Small LH surge on CD 12  
 PdG changes confirm ovulation  
 Short luteal phase of 9 days

### 8. Medicated cycle with Clomid example



Mira Data Discovered:  
 Multiple E3G results at max threshold of 640 due to Clomid blocking estrogen receptors in the brain, signaling the pituitary to increased FSH/LH production which boost estrogen.  
 HCG used as trigger injection cross reacts as Mira LH

## Fertility Case Reports

- Utilizing NaProTECHNOLOGY and Mira for Infertility - [View here](#)
- Severe menstrual cramps with an ovarian cyst and endometriosis- [View here](#)
- Three case reports with a Functional Medicine Approach: PCOS, Secondary Infertility, Abnormal LH and low progesterone- [View here](#)
- Stimulated Cycles: Empowering Reproductive Health from Home - [View here](#)

## Provider Testimonials

"I am excited about giving my patients access to daily, sophisticated and (importantly) EASY at-home hormone testing. Think PCOS, fertility, PMS, etc. With Mira, we may be witnessing the next disruptive player in the Functional Medicine ecosystem."

Dr. Kara Fitzgerald, LLC | Functional Medicine Longevity, Epigenetics

"Mira has revolutionized my practice by providing real-time insights into my patients' daily hormone levels, allowing for precise monitoring of their menstrual cycles. This technology enables me to educate patients on the specifics of their cycle, particularly highlighting the role of progesterone as a key indicator of ovulation. With Mira, we can demonstrate how ovulation can vary from month to month, empowering patients with knowledge and enhancing their reproductive health management."

Dr. Tara Harding (Brandner), DNP, FNP-C, Founder of "Simply You"

" As a Restorative Reproductive Medicine (RRM) physician with expertise in cycle charting and monitoring, this device is a game changer for many patients! Excellent tool to help them, and their medical team, understand their cycles."

Dr. Tracey Parnell, Assistant Clinical Professor at the University of British Columbia and the Director of Communications and Development for the International Institute for Restorative Reproductive Medicine

"Given the relative ease of testing hormones throughout the cycle with Mira, compared to serum hormone testing every other day in a lab, the patient was able to see evidence of improvement with treatment. Seeing improvement in cycle hormones motivates the patient to continue with treatment plan and encourages compliance."

Naprotechnology Physician