

PURPOSE

To continue to teach students how to chart the biomarkers of hormonal health.
To focus on the impact of nutrition, exercise, and sleep on hormones and health.

LEARNING OBJECTIVES

By the end of the lesson students will be able to:

1. Understand how to chart and recognize healthy cycles.
2. Identify the three pillars of health and recognize their impact on hormones.

MATERIALS & RESOURCES

- Lesson 6 teenFEMM powerpoint
- Worksheet: Addison's Chart
- Case Study: The Three Health Pillars
- Healthy Habits Challenge

VOCABULARY

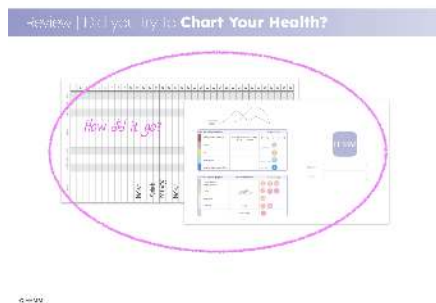
- **Hormones:** Chemical signals that travel in the bloodstream, directing the activity of every system in the body.
- **Luteal Phase:** The part of the cycle that is after ovulation, but before menstruation.
- **Health Pillars:** Nutrition, exercise, and sleep are necessary to maintain good health.
- **Habit:** Something you do so often that it becomes natural for you.
- **Nutrition:** Foods that nourish the body, necessary for health and growth:
 - **Proteins:** build and maintain cells, help make hormones.
 - **Carbohydrates & fats:** provide energy, balance hormones.
 - **Vitamins & minerals:** build and maintain cells, balance hormones.
 - **Water:** carries nutrients, energizes muscle, clears waste.

PREPARATION

- ☐ Print the **Worksheet: Addison's Chart**. Cut along the dotted lines to provide one practice chart for each student. Students will need pencil crayons: yellow, gray, red, pale blue and darker blue.
- ☐ Print the **Case Study: The Three Health Pillars**
- ☐ Print the **Healthy Habits Challenge** (double sided) for each student.

PROCEDURE

Step 1 (2 minutes): *Introduce the lesson.*



Did you try to chart your cycle this past week? Did it help you to understand yourself or what's going on in your body? *Give students a minute to volunteer to share any of their responses to these questions.*

If you haven't started charting yet, or did but forgot for a few days and then had trouble getting back to it, that's OK! The great thing is that you can always start at any point. If you've never paid attention to your biomarkers before, it can seem a little bit overwhelming. But maybe, if you start to chart, recognizing your own biomarkers will give you confidence in your body, realizing that what you had maybe previously thought was weird, random, or even something *bad*, is actually a normal and healthy sign of what your hormones are doing.

Step 2 (10 minutes): *Introduce the case study for the day.*

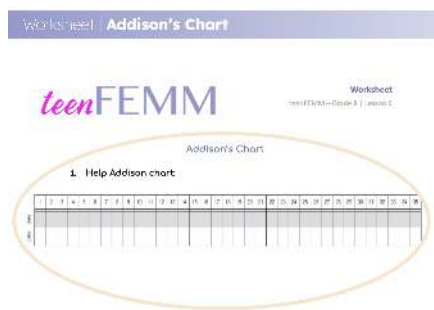
Let's learn about Addison.



Addison is 13 years old and just started 8th grade. She has been charting for about 6 months. At first, her charts were much like the one we saw last lesson: some off and on cervical mucus that she charted with the symbol yellow and gray. There were times when she wondered if it was even worth charting! She felt like getting her period might be the only obvious biomarker she could confidently identify!

Then, about 2 months ago she started to notice a little bit more cervical fluid and began to chart some blue days. She remembered from her teenFEMM course that this indicated that her brain and ovaries must be communicating more and her hormonal axis was maturing. From her chart, we can actually get a picture of what is going on in her ovaries and how these hormones are acting on her cervix, producing different types of cervical mucus that she can observe. Let's take a look.

Hand out the **Worksheet: Addison's Chart** to the class.

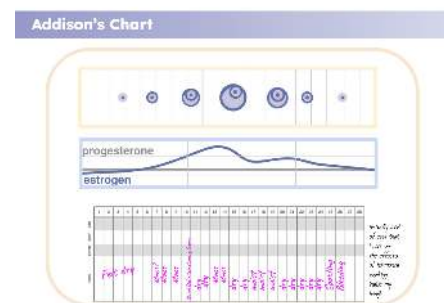


Let's help Addison fill in her chart, based on her charting notes. But first, let's review the colors we use to chart the biomarkers.

Charting Symbols

Color	Symbol	Hormone	Biomarker observation
Red	H.M.L.L.S	very low estrogen + progesterone	bleeding
Yellow		low estrogen	pasty
Light Blue		rising estrogen	moist sensation
Dark Blue		high estrogen	slippery sensation, clear, stretchy
Gray		progesterone	dry

What is red for? Bleeding. How about yellow? Yellow is for *low estrogen*. What about gray? Gray is for the hormone *progesterone* and the sensation that accompanies this is dryness. Now, we're getting a little more specific about blue today. Light blue is for *rising estrogen* and it has a moist sensation. Dark blue is for *high estrogen* and it has a slippery sensation. You might even see clear or stretchy looking mucus on the paper when estrogen is high. Alright, now let's get back to Addison.



On the first 6 days of her charting, Addison didn't "feel" any moisture when wiping and so she made a note that said, "felt dry". Looking at the egg and follicle in the ovary (top row) and also her hormonal chart (second row), does it make sense that Addison didn't feel or notice any cervical mucus? Yes! The egg and follicle aren't growing much and the hormone graph shows us that estrogen is lower than progesterone for the first few days. So, *progesterone* acts on the cervix to produce a dense mucus that seals the cervix and causes a sensation of *dryness*. *Have students fill in the first six days of the chart with the color gray.*

On day 7, Addison noticed a change to *moisture*. She said this felt different and looked different from the crumbly, pasty substance she noticed before, in earlier cycles. She had this for 3 days. What should she chart? **Light blue** for *rising estrogen*.

On day 10, Addison feels something very different. “Woop! Definitely slippery feeling,” she wrote in her notes. *“Actually kind of cool that I can see the effects of the hormones inside of my body,”* she wrote on the side. It’s more than moisture, so she charts this as dark **blue**, for *high estrogen*.

Then, the next day she feels dry. It’s a very different feeling when wiping, compared to the day before. She charts **gray**. *She has this again the next day. She charts **gray**.*

Then she feels some moisture again on days 13 and 14. It’s not like it was on day 10, so she charts **Light blue**.

Then she goes back to dry on 15 and 16. **Gray**.

Some moisture again on days 17-19. **Light blue**.

On day 20 it’s dry. **Gray**.

On days 21-24 it feels the same. *Dry.* **Gray**.

Day 25 she notices some very light spotting. She charts this with **Red**. *On Day 26 she notices that her bleeding is heavier than the day before. She charts **Red** again.*

Have students compare their chart answers against the answers on the following slide:



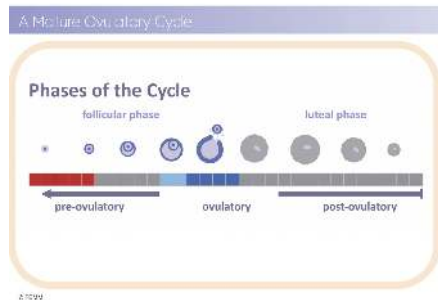
Ask students if this is what they charted for Addison.

Step 3 (5 minutes): Progesterone and the Mature Ovulatory Cycle

Based on this chart, do you think ovulation occurred? No, not this cycle, but this is ok. Her brain is sending messages to her ovaries to start to develop an egg, and as the egg grows, it is producing estrogen. These increased levels of hormones are contributing to

Addison's growth and development.

In Addison's first few cycles, dry days indicated that she was experiencing very little hormonal activity (low progesterone AND estrogen) - remember the chart in the previous lesson that was just yellow and gray?



In a healthy, mature cycle the dry phase after ovulation is called the **“luteal phase”** as progesterone is the dominant hormone, produced by the **corpus luteum**.

In the case of Addison's chart, she had estrogen biomarkers, but no ovulation occurred, as she had only *five days of dryness* before her period. Remember: no ovulation, *no corpus luteum*. For Addison's age, her chart is still healthy. But as her cycle matures, a healthy luteal phase should be between 9-18 days.

Now, we know it's so important to have both estrogen and progesterone balance each other out. So, is there anything Addison can do as she grows and matures to help balance her hormones? Yes!

Step 4 (10 minutes): The 3 Health Pillars



Addison needs to practice the three pillars of health: adequate nutrition, exercise and sleep. These three pillars will help her brain and her body mature in the best way

through puberty.

The first pillar of health is **Nutrition**. Good nutrition fuels the body, which is especially important now, as your brain and hormones are still changing and developing. Everything we eat, our body breaks down and uses to nourish our bones, muscles and cells. So it's important to give our body what it needs.



Your body needs:

Proteins: build and maintain cells, help make hormones.

Sources: red meat, chicken, fish, eggs, beans, yogurt, etc.

Carbohydrates & fats: provide energy, balance hormones.

Sources: whole grains, pasta, potatoes, oats, etc.

*Healthy **fats**: avocado, olive oil, nuts and seeds, as well as peanut or other nut butters.*

Vitamins & minerals: build and maintain cells, balance hormones.

Sources: green leafy vegetables, carrots, oranges and bananas, blueberries, blackberries, beets, etc.

Water: carries nutrients, energizes muscle, clears waste.

Note: Teens are supposed to drink 1L to 2L of water a day to stay hydrated and flush out toxins!

The second pillar of health is Physical **Exercise**.

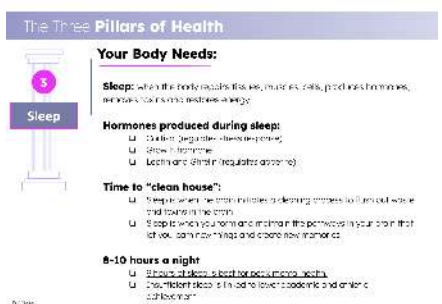


Your body was made to move! Physical exercise is not for the benefit of Instagram or social media, it's not just for athletes and it's not about being a certain body type or weight.

Exercise increases your energy, improves your mood and reduces anxiety. **How does exercise improve your mood?** Exercise releases hormones called endorphins, which are chemical signals from the brain (in the pituitary gland) that increase feelings of wellbeing. As we know, hormones are all chemical messengers. The job of these hormones is to make you feel happier, more confident, and less stressed! So physical activity literally exercises the hormones in your brain! 60 minutes of activity every day is recommended to all teens.

Exercise can be “you” time, simply going for a jog as you listen to music. Or, grab a friend and power-walk together. Whether you like playing sports, dancing, swimming or even jumping rope, the important thing is to find an exercise you enjoy.

The third pillar of health is **Sleep**.

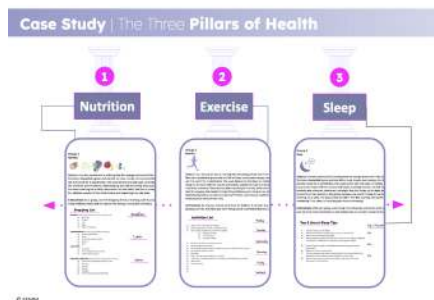


Sleep is absolutely essential to health. ***Did you know that every part of your body is renewed faster during sleep than when awake?*** Most of your reproductive hormones are produced while you sleep!

In order for your body to repair itself at the end of each day, you need 8-10 hours of sleep at night! 9 hours of sleep is recommended for optimal mental health (reduces anxiety and depression). Getting 8-10 hrs of sleep a night regulates your growth hormones, maintains a healthy weight and improves your brain's ability to learn new things.

Step 5 (8 minutes): Case Study: The Three Health Pillars

Divide students into 3 groups and give each group one of the 3 case studies to work on.



Give each group a few minutes to read their case study and write down their recommendations. Then, have each group briefly present their recommendations to the class.

CONCLUSION

*Hand out the **Healthy Habits Challenge** to students.*



In this lesson, we learned more about charting and how your charting will change as a

healthy cycle matures. We also learned that we can take charge of our health by practicing the three health pillars: nutrition, sleep and exercise. This week, we're going to take the *Healthy Habits Challenge* and try to see how many days in a row you can practice the three pillars of health! There are tips and ideas on the back of the page.

Note: students may be more motivated if there is a reward, or, if it's a students versus teachers challenge.

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