Re: Those Wild & Crazy Hormones

How they impact your ADHD

Linda Roggli, PCC

Re: Those Wild and Crazy Hormones How They Impact Your ADHD

by Linda Roggli, PCC

© 2017 Passionate Possibility Press all rights reserved Note: This ebook should not be used as medical advice. Its purpose is educational only. Please check with your personal physician or medical professional for the treatment that is appropriate to your age, your history and your body.

The Essential Guide to ADHD, Hormones and Brain Power

Memory glitches, total recall Brain fog, perfect clarity Distractions, focus

Welcome to the exciting sidecar symptoms of microscopic friends, your hormones.

There are more than 50 hormones circulating through and active in our bodies; insulin, for instance. They all do amazing things; some even transform into each other! Here, we'll focus on three of the best known and most popular hormones: estrogen, progesterone and testosterone

Though these three are generally discussed in terms of their reproductive and sexual purposes, they are also important in the neurology of your brain. If a hormone is active in the brain, it must also touch on our Attention Deficit Hyperactivity Disorder.

Research on the relationship between hormones and ADHD is sparse but growing. Some studies have remarkably similar results, validating the finding. As is often the case, however, other studies are contradictory; one says "yes" another says "no." We have used the most reliable and highly validated information available while paying tribute to the outliers.



Hormones and Your Brain: The Back Story

It all started when you were a blob of rapidly dividing cells, barely recognizable as a human being, let alone as the magnificent specimen you are today.

Those little chemical powerhouses we now know as hormones were doing their jobs, turning us into boys or girls depending on the eggand-sperm cocktail *du jour*.

By the time you were born, they had worked their magic, creating appropriate gender genitalia and predisposing each of us to a life of either wide hips for childbearing or lean muscle mass for hunting (and football).

But the lineup of hormones touched far more than our tiny sexual selves; it roared to life in a dozen different forms. The most potent bathed our baby brains in a luscious elixir that would soon influence our moods, our thinking and, eventually, our ADHD.

So what it is about these chemical formulations that can not only transform a young man's voice from tenor to bass and a young woman's figure from flat to curvy, but also send us into an aggressive frenzy or a depressed anxiety?

It's all about the interaction (or lack of interaction) between and among your brain's neurons and those interesting chemicals. Say hello to:

- Ms. Estrone Estrogen (aka E1) Ms. Estradiol Estrogen (aka E2) Ms. Estriol Estrogen (aka E3) Ms. Progesterone
- Mr. Testosterone



Progesterone



A quick primer on hormones

Estrogens

E1/Estrone

Found in low levels most of women's lives until menopause. Then it becomes the dominant estrogen unless hormone therapy is initiated. In a pinch, estrone can turn into estradiol and vice versa.

E2/Estradiol

This is the subtype of estrogen that does the heavy lifting for women. It surges at puberty, waxes and wanes during the monthly cycle and then drifts into oblivion after menopause. It is up to five time more potent than estrone (E1).

Estradiol is created from the aromatization of testosterone in both men and women. In men estradiol is present at one-tenth the levels found in women, but is important in bone density. Only estradiol is used as the estrogen in Hormone Therapy.

E3/Estriol

Estriol doesn't poke its head into the hormone mix until pregnancy, when levels skyrocket. Otherwise, it plays only a small day-to-day role for men or women.







The rest of the team

Progesterone

Found in both men and women, progesterone is important as a precursor to other hormones, especially testosterone. Produced in the ovaries and by the placenta during pregnancy in women, it fluctuates during the monthly cycle, as does estrogen.

Men need progesterone to counteract the effects of estrogen. It protects men against bone loss, hair loss, depression and other undesirables.

Testosterone

This is the main "androgenic" hormone for men and women (androsterone is another). In guys it creates appropriate genitalia and hairy chests. Men produce testosterone in the gonads and to a lesser degree in the adrenal glands.

In gals, testosterone is the precursor to estrogen and is produced mainly in the ovaries. Some studies show testosterone increases sexual desire in women.

Testosterone levels are relatively stable for men until midlife when they start to decline very gradually. As testosterone diminishes, estrogen plays a more significant role, but not in a good way. It opens the door to prostate cancer and cardiac events such as heart attacks.

Older men find they are more challenged cognitively. They can be more moody and have trouble getting a good night's sleep.





The Estrogen Fan Dance

Little girls are born for relationship. Literally, the estrogens in their brand new brains crave connection, so baby girls make eye contact far more often than their male counterparts.

That's the first, but certainly not the last indication that girls are different from boys. Newborn girls often have a high level of estrogen circulating through their bodies,

because mom's estrogen has been sky high in the final months of pregnancy. The baby's estrogen declines within a couple of months but it begins a flirtatious fan dance of hiding and revealing itself that will last a lifetime.

Gradually, estrogen levels increase for girls (see chart). They begin the march toward puberty at an average age of 10-and-a-half. There is some research that shows African American girls and girls who are overweight may reach puberty one year earlier. Puberty for girls means budding breasts, the beginning of the menstrual cycle and perhaps pubic hair.

Regardless of the age at which they enter puberty, estrogen levels continue on an upward swing. By the time girls reach age 14, their circulating estrogen for estradiol (our friend E2) is at least 10 times higher than at birth and sometimes 8 times higher than at the start of puberty.



Estradiol levels in girls

Age Level 7.1 years - 1-20 pg/mL 10.5 years - 1-24 pg/mL 11.6 years- 1-60 pg/mL 12.3 years - 15-85 pg/mL 14.5 years - 15-350 pg/mL Adult women - 15-350 pg/mL Menopause - <10 pg/mL

pg/mL=picogram per milliliter Source; Mayo Clinic Laboratories

Note from the chart that there can be a wide range of estradiol among individuals, by a magnitude of threefold to tenfold, but the 15-350 pg/mL swing happens during the monthly cycle. Estrone (E1) and estriol (E3) are patiently watching from the wings, waiting for their chance to dance.

A monthly encounter

We don't need to belabor mechanics of the menstrual cycle, but just for the record, the first (1) day of the cycle is the day bleeding starts. Notice that the levels of estrogen are extremely low on Day 28 (the day before the period begins) and Days 1 and 2 before it builds again. (Progesterone is also in play, but we'll cover that in a bit).

Some estrogens circulate in a women's body through the bloodstream. They are known as serum estrogen and it is this level that is measured by doctors.



Every part of the body is exposed to estrogen but only a few lucky organs get to play with it fast and hard. One of those is the brain. Estrogen seeps into the brain by crossing the blood-brain barrier (a protective mechanism that keeps out toxins but welcomes the good guys). There, it is like a buzzing bee, racing here and there to help out the teeny little neurotransmitters do their job more effectively.

When neurotransmitters do their job better, our brains work more efficiently. We are more clear. We can focus. Our ADHD is less cumbersome. It follows then, that **when estrogen levels are high, our ADHD symptoms are low.**



The Fan Dance repeats and repeats and repeats

For a couple of weeks after the menstrual period, ADHD women's brains flaunt their estrogen, and click along on all cylinders. Then a few days later, the fan dance continues and estrogen modestly retreats. Women's brains become estrogen-deficient.

It's this regular elevator ride up and down that brings on the monthly "blues" or worse. For some women, the physical and emotional after effects of low estrogen cause debilitating problems such as Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD). As many as 75 percent of all menstruating women report some kind of premenstrual discomfort.

Symptoms of PMDD include mood swings, depression anger, anxiety, hopelessness, irritability, insomnia or excess sleepiness, fatigue, self-critical thoughts, increased sensitivity to rejection, and lack of concentration. It's a perfect storm for an ADHD women's brain.

Not only does our fan dancer flirt monthly, she also makes a big splash during pregnancy and at menopause. During pregnancy, estradiol and estriol join forces for a showy display of high estrogen levels. Even for non-ADHD women, mood improves, concentration is sharper and there is a feeling of wellbeing.

At peri-menopause, which can begin 10 years before the actual cessation of menses, estrogen does a stuttering fan dance, flooding women's bodies with an abundance, then a dearth of estrogen. The infuriating problem with hormones at menopause is their irregularity. Women never know when a hot flash will hit or a snappy answer will come out of their mouths.



Progesterone



Progesterone is the quiet hormone. It calms the waters of our anxious minds. It is the counterpart to energetic estrogen (particularly estradiol). While estrogen strongly activates serotonin in our brains (the "happiness hormone"), progesterone has the opposite effect.

Some studies show that progesterone causes brain fogginess and even depression. Progesterone may contribute to sleepiness since it has a sedative effect. You may be calmer, but you can't stay awake to enjoy it!

Note that the peak in estrogen does NOT coincide with the peak in progesterone during the monthly cycle. Since progesterone is more highly involved in preparing for the uterine wall for pregnancy, it makes sense that it is at its highest point in the cycle just before the period starts. It gets ready for company (an embryo), no one shows up, so it dwindles, gives up on the preparation, then rebuilds a few weeks later.

For men, progesterone does not influence cognition since it is converted to testosterone.

Testosterone

Though both men's and women's bodies use testosterone across the lifespan, it is the dominant steroid hormone for male traits.

Testosterone is high in newborn baby boys but by six months of age, it subsides to negligible levels. When boys approach puberty, usually around 10 or 11 years old depending on the individual, testosterone become a more prominent player.



At the high end of the spectrum, the levels jump sevenfold and by age 14, tenfold. Around the age of 15, testosterone settles into a high, yet fairly predictable potency in the body, declining slightly by age 19. All of this data is based on averages, so individuals may have delayed puberty and thus lower levels.

Unlike women's estrogen, testosterone remains stable throughout the male adult life. It begins to decline slightly each year after age 45. By age 85, testosterone has weakened its hold on the male endocrine system and estrogen levels increase in response.

Low testosterone for men can result in a change in sleep patterns, increased body fat and an accompanying reduction in muscle tissue, decreased bone density and emotional changes such as low self-

confidence or lack of motivation. There is also a decline in cognitive performance as testosterone declines with age.

Testosterone levels in boys

Age ----- Level 6 mos - 9 years - <7-20 ng/dL 10-11 years - <7-130 ng/dL

10-11 years - <7-130 ng/dL 12 - 13 years - <7-800 ng/dL 14 years - <7-1200 ng/dL 15-16 years - 100-1200 ng/dL 17-18 years - 300-1200 ng/dL 19+ years - 240-950 ng/dL 50+ years - 606 ng/dL avg. 85+ years - 376 ng/dL avg.

> ng/dL=nanogram per deciliter Source; Mayo Clinic Laboratories & Declining Androgens wtih Age, Vermeulen

The ADHD Connection

What does any of this have to do with ADHD? Plenty! And it all starts with those crafty neurotransmitters in our brains.

Most experts consider dopamine (dope-a-meen) and norepinephrine (nor-ep-en-ef-fren) to be the two most important neurotransmitters that affect ADHD.

Dopamine is the pleasure neurotransmitter. As our friend Dope A. Mean shows us, he's one wild and crazy guy. Dopamine loves sex, drugs and rock and roll - usually to excess. When we want a dopamine fix we might head for the ice cream (carbohydrates stimulate dopamine) or Amazon for some shopping. It wants us to have a good time, whatever that means to you.

It is also associated with focus and attention. Dopamine reacts to what you see (via the optic nerve) and directs you to take action. It is also an essential part of working memory. Working memory is holding one thought in your mind while being distracted by another and then remembering the original thought.

All of these things are ADHD bugaboos. We struggle with working memory and focus and now we know why: dopamine deficit.

Our friend Nora (norepinephrine) is a step-child: her chemistry is synthesized from dopamine. Nora is a stress hormone, activated by "fight or flight" urgency. Stress requires a lot of focus and attention, thus she is a part of the ADHD neurotransmitter team. Oh, and she's also a part-time hormone!



Dope A. Mean



Nora Penne Effrin

Dance of the Neurotransmitters

OK, this where it all comes together - hormones, neurotransmitters and ADHD.

The illustration on this page shows a snapshot of what happens at the synapse (the tiny space between neurons) Dopamine and norepinephrine would be among those tiny little dots between the two big boulders. Except those aren't boulders, they're neuron ends. And the dots are neurotransmitters, And the scale of this picture is **approximately 4.7 million times larger than real life!**

It's almost unimaginable that something so small could bring us to full attention or let our working memory flounder. Yet that is exactly what happens in our ADHD brains.

Our neurotransmitters shuttle vital information that will be transferred like lightening to the next neuron and the next and the next. When our neurons don't receive or send an adequate supply of neurotransmitters, our brains don't operate at full capacity.

That's bad enough, but when hormones enter the picture, things really start to get interesting. As we mentioned previous, estrogen is a gal about town in your brain, doing a lot of different jobs, but one singularly important one is to *help neurotransmitters make good connections.*

It can act as the lubricant to smooth the incredibly quick electrical connections, a boon for us with a tendency to go off script and lose our smart phones. When estrogen disappears, it can be devastating for ADHD women.

The Triple Whammy

Let's revisit women and estrogen for a moment. Remember that estrogen is high at midcycle and almost gone right before your period starts.



That's the height of ADHD symptoms. Low estrogen, big ADHD issues. Two-and-a-half weeks of relative ADHD bliss, followed by the ADHD nightmare that culminates in starting your period, feeling awful. Then a few days later, returning to your old self.



This ocean-like ebb and flow happens month after month. *Good ADHD. Bad ADHD.* It's crazy making.

Worse, it has been shown that stimulant medication for ADHD is not as effective during the low estrogen phase of the menstrual cycle. And ADHD women tend to have more issues with PMDD than non-ADHD women.

So not only does the ADHD get worse during the menstrual cycle, the meds don't help and there's a good chance you are dealing with premenstrual issues. Triple whammy!

A look backwards

For young girls, estrogen plays a more prominent role in maturity as they get older, but it's not a steady incline. Hormone levels fluctuate, gradually increasing in strength. During the transition, girls' bodies and brains constantly adjust to shifting levels of estrogen and progesterone. The balance between the two can produce significant behavioral issues.

There is evidence that **hormone fluctuations in adolescence is associated with a first diagnosis of depression**. Moodiness is common, as is irritability (ask any mother of a pre-teen girl), These are similar to the same symptoms seen later in Premenstrual Dysphoric Disorder. It's a tough time for girls-turning-into-young-women.

These hormonal issues often pull back the covers on ADHD girls previously undiagnosed because they were "such good girls" who caused few problems in school.

Most of these girls are the Inattentive type ADHD, which is characterized by daydreaming, a messy desk and/or forgetting school assignments.

When hormones hit, however, Inattentive girls may withdraw or they may be extremely moody. This is when an ADHD diagnosis is more likely. Too often girls are diagnosed with depression before their health care professionals realize that ADHD is part of the picture.

ADHD boys are usually diagnosed before adolescence, mostly because they demonstrate hyperactive behavior. Girls tend to be diagnosed later. School is more difficult, friends are harder to find and ADHD becomes more obvious to parents and teachers. Even if girls have been able to cope with their hidden ADHD in elementary school, the added stress of adolescence reveals the truth.



Menopause: the agony and ecstasy

What do menopause and adolescence have in common? Wildly fluctuating estrogen levels in women. The big difference is that adolescent girls' estrogen levels are gaining in strength, while estrogen levels in peri-menopausal are in decline, eventually to be virtually eliminated.

With such huge peaks and valleys in estrogen availability, women start to experience memory lapses, brain fog and other harbingers of old age. There is widespread panic and worry that early onset dementia is a possibility.

These are normal aging concerns. For ADHD women, diagnosed or not, the years before menopause can be challenging. As with their teen counterparts, ADHD women at midlife are prone to mood swings and depression. Tasks that were easily completed in the past require serious effort and concentration. But concentration has deteriorated, too!

Some of these symptoms happen all women. But **the normal aging process is exponentially more difficult for women with ADHD.** Since ADHD gets worse when estrogen declines, it's not unusual for women at midlife to seek help from their doctors. Or they may take online tests and start to recognize a lifelong pattern that adds up to ADHD. Self-diagnosis is A-OK unless you need health insurance to cover treatment costs.

There is often a sigh of relief at a later life diagnosis, accompanies by a sigh of regret over missed opportunities. "If only I had known about my ADHD earlier!"

Men, ADHD and the hormone soup

ADHD women spend their childbearing years hanging on for dear life as their ADHD swings inversely to the amount of estrogen available to their brains.

Men with ADHD suffer far less than women from interval hormonal influences. They have circulating estrogens in their bodies and brains but research shows that while estrogen can boost women's memory, learning and mood, it may well have the opposite effect for men. Until testosterone diminishes in strength, estrogen is a minor, though important, factor in cognitive function.

That doesn't mean ADHD men don't suffer many of the same ADHD indignities as women: lack of focus, trouble at work, financial problems, distractibility. It's just that their ADHD symptoms are rarely influences by their hormones - unless it's the impulsivity to have sex without birth control. Unplanned pregnancies are much higher among ADHD couples.



And speaking of pregnancy

For many ADHD women, pregnancy means a remission of their cognitive symptoms from the first trimester through the end of nursing their new baby.

With estrogen levels climbing throughout gestation, there is far more clarity and concentration on board. That's a good thing considering that most ADHD women elect to discontinue taking their stimulant medication during pregnancy. At least one leading psychiatrist says that is unnecessary, but it is clearly an individual choice.

Immediately after delivery, estrogen plummets in the new mother's body. The mother's outlook on life changes abruptly from happy to depressed - the familiar "baby blues" which happens even for non-ADHD women.

But when the estrogen drops, ADHD comes roaring to life again. A newborn baby, mountains of laundry, perhaps other children at home - no wonder ADHD mothers need support! Hiring help for the first month is a smart idea, if it's in the budget.

Nursing mothers maintain a healthy level of estrogen as long as they continue nursing. But usually nursing tapers off gradually, so estrogen disappears more gradually, too. It's not the "off the cliff' kind of drop that happens after delivery.

Of course, non-nursing moms can return to their ADHD treatment plan immediately, which can help disarm some serious problems.

But what do you DO about it?

If low estrogen exacerbates ADHD in women of all ages, it makes sense to consider estrogen replacement through hormone therapy (HT).

For some women, even the mention of HT sends them scurrying for cover. Yes, HT is controversial, but it's time for a quick reality check. JFYI - this section is not an endorsement of HT, it's just information.

The first clue that HT might not be for everyone came from the Women's Health Initiative, a mammoth four-pronged research project launched in 1991 by the National Institutes for Health. More than 150,000 women were studied over 15 years.

One section of the study was interrupted prematurely because women taking a combination of estrogen and progesterone therapy showed a higher than average rate of breast cancer, heart attacks and stroke. On deeper examination of the results, doctors agree there were some flaws in the study.



The women enrolled in the HT combination study were many years post menopausal - the average age was 67. Today doctors prefer to initiate HT within five years of menopause.

Cardiac and cancer risks were far less deadly than originally reported in the media.

If you investigate HT, know that for ADHD women, estrogen only HT is recommended because progesterone can cause brain fog. For women who still have a uterus, the addition of progestin is strongly suggested to mitigate the risk of uterine cancer.

Not everyone is a candidate for HT. Women with a history of breast cancer in their genetic families or themselves are rejected for HT replacement. Each woman should have a frank conversation with her doctor to discuss options but don't be surprised if he or she knows nothing about the hormone/ADHD connection. It's not widely known.

Questions to ask your doctor about HT

1. Do you have any experience treating cognitive symptoms of menopause with estrogen?

2. Knowing my medical history, what are my risks if I elect to start HT?

3. Do you prescribe HT only for vasomotor symptoms? (hot flashes)

4. How long do you allow your patients to stay on HT?

5. What delivery system do you prefer - estrogen patch, combination patch, oral estrogen, oral progestin, or something else?

6. I have ADHD and my cognitive symptoms are much worse at menopause. Can we include that factor in the decision about whether to start or continue HT?

7. What cardiac red flags do you look for when prescribing HT?

The summary

1. Estrogen is the prime culprit that impacts ADHD women's brains.

2. Estrogen increases in puberty for girls, which is one reason girls are diagnosed more frequently at this age.

3. ADHD symptoms often get worse right before the menstrual cycle begins and improves a few days later.

4. Pregnancy is an estrogen extravaganza- lots of it, but has a precipitous drop immediately after delivery (but can prolong estrogen level through nursing).

5. Menopause is another high-low estrogen event which leads many women to an ADHD diagnosis.

6. Hormone therapy improves cognitive for ADHD women, but has serious drawbacks for some women.

7. Men's hormones are not a major factor in ADHD symptoms but with aging, testosterone declines, leading to moodiness, sleep issues and cognitive decline.

8. Useless factoid: bananas contain dopamine, the pleasure hormone, but the dopamine cannot cross the blood-brain barrier, so eating more won't help your brain!



About Linda Roggli, PCC

Linda Roggli, PCC is a Professional Certified Coach, award-winning author and founder of the ADDiva Network for ADHD women 40-and-better. She is an expert in later life ADHD; her book "Confessions of an ADDiva: midlife in the non-linear lane" won first prize in the Next Generation Independent Book Awards. She has coached hundreds of women through private and group coaching as well as ADHD women's retreats. She served as vice-president of ADDA and has chaired its webinar series since 2009. She is the ADHD expert on Selfhelp.com and a guest blogger for sixtyandme.com. She is a popular speaker at national and international conferences. Her office is headquartered in Durham, NC where she lives with her non-ADHD husband and two very ADHD Shelties.

And yes, she finally decided to use HT for her sanity as well as her ADHD!

Reach her at http://addiva.net or http://addivaretreats.com