

Addressing Anxiety in Teenage Patients

AN INTEGRATIVE MEDICINE CASE STUDY

WITH EXPERT PERSPECTIVES BY:

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PATIENT INFORMATION



Name: Zoe		Race/Ethnicity: Asian, Chinese American
Date of Birth: September 3, 2008		
Problems: Anxiety, acne, trouble sleeping, trouble concentrating		
Allergies: None		
Social History:		
Alcohol: No history		
Smoking: No history		
Vital Signs:		
Height: 5'3"	Weight: 100 pounds	
BMI: 17.7	Total cholesterol: 160 mg/dL	
Blood pressure systolic: 110 mmHg	HDL cholesterol: 50 mg/dL	
Blood pressure diastolic: 70 mmHg	Non-fasting glucose: 100 mg/dL	
Medications:		
None		
Health Concerns:		
Anxiety, acne, fatigue		



CASE STUDY



Meet Zoe

Zoe is a 15-year-old girl living in the suburbs of San Francisco. Ever since she was young, Zoe has been prone to anxiety. However, after staying home from school during the pandemic, Zoe became very socially anxious, in part due to the cystic acne she developed during that time.

When she was four years old, Zoe's mother died of advanced ovarian cancer. Now, she lives with her older brother and dad in a small apartment. Zoe's dad works late at his restaurant in San Francisco, leaving her and her brother, Tyler, home alone most nights. For dinner, they often have quick meals like instant noodles or boxed mac and cheese.

Before the pandemic, Zoe was an avid ballet dancer. When the dance studio opened again, Zoe was thrilled and felt like it was an outlet, especially when she still had online school. However, once she returned to school, her anxiety worsened, and she found herself paralyzed, unable to leave the house and she quit dance.

At first, there was still a mask mandate at her school, which allowed her to cover up some of her acne and feel more comfortable. But soon, the mandate was lifted, and it was seen as uncool to wear a mask. That's when Zoe started finding reasons not to go to school, telling her dad she didn't feel well.

Zoe was always a good student; however, her grades fell when she started missing class, and her teachers were concerned. Her dad did not know how to manage the situation. Because he was away from the house so often, he didn't want to do anything to jeopardize the relationship they had, so he let her do what she wanted.

Today, Zoe misses at least one day a week from school. When she's not at school, she spends her days in her room, watching TV and scrolling through social media. For the most part, Zoe doesn't eat in the morning at all. She'll often have a big meal, scavenging whatever was in the kitchen, when she arrives home from school, and then eat dinner with her brother after his practice around 7 p.m. Then, at 10 p.m., she's usually hungry again and eats a smorgasbord of leftovers and snacks.

During the day, Zoe reports feeling fatigued, but come 8 p.m., she gets a burst of energy. Unable to fall asleep, Zoe goes to bed around 1 a.m. most nights, waking up at 6:30 a.m. for school. On the weekends, she sleeps in until around 11 a.m. or even noon.

Zoe got her period at age 13 and shortly after is when she started getting cystic acne. Her cycle sometimes lasts 40 days, while others are 25, and the flow varies from manageable to heavy. Despite trying all the skincare routines she sees on TikTok, her acne is still bad on her forehead, cheeks, and chest.

Zoe's aunt recommended that her father take her to an integrative practitioner to get a better sense of her problems. Zoe agreed to go with the hope that it would help clear her acne and decrease her anxiety levels. ○





DR. SCOTT’S PERSPECTIVE



Tara Scott, MD, FACOG, FAAFM, ABOIM, CNMP

For the past ten years, Tara Scott, MD, FACOG, FAAFM, ABOIM, CNMP, has focused on the hormone niche, transitioning from OB-GYN to practicing integrative and functional medicine, seeing patients from the onset of menstruation. To treat Zoe, Dr. Scott would determine how and why her hormones were imbalanced and use lifestyle interventions, diet, and supplementation to address the root cause of her symptoms.

FIRST VISIT

During Zoe’s first visit, Dr. Scott’s goal would be to gather a comprehensive intake. She would ask Zoe about the length of her menstrual cycle and how bad her cramps were. Dr. Scott would also inquire about Zoe’s gut health, asking about the frequency and appearance of her bowel movements using the Bristol Scale.

At the end of the appointment, Dr. Scott would order several tests. Depending on whether Zoe’s cycles are more frequently 25 days or 40 days, blood would be drawn on either day 19-21 or day 28 of her cycle. Dr. Scott would encourage Zoe to track her period using a period-tracking app.

Blood tests, to be done while fasting, would include a metabolic panel, complete blood count, full thyroid panel, vitamin D, follicle-stimulating hormone (FSH), luteinizing hormone (LH), estradiol, free and total testosterone, progesterone, dehydroepiandrosterone (DHEA), dehydroepiandrosterone sulfate (DHEA-S), and A.M. cortisol if possible. Additionally, Dr. Scott would test Zoe’s candida immune globulins (IgG, IgM, IgA) and a candida immune complex.

CARE PLAN

During their next visit, Dr. Scott would review Zoe’s test results with her. She would likely follow up using the DUTCH test to assess Zoe’s hormone levels, ensuring it is collected post-ovulation to avoid inaccuracies and unnecessary costs. The DUTCH test would

help Dr. Scott confirm her suspicions of an imbalance between estrogen and progesterone, issues with estrogen detoxification, and potential adrenal problems with cortisol.

According to her healthy history, Zoe is showing extreme stress with primary complaints of acne, anxiety, and fatigue. Two years after starting her period, Zoe’s menstrual cycles remain irregular, ranging from 25 to 40 days, which would indicate possible low progesterone and inconsistent ovulation,

Dr. Scott explained. She said that these irregularities suggest hormonal imbalances, with estrogen potentially being high or low and higher testosterone levels, which is typical in teens. She added that high cortisol could also be affecting Zoe’s estrogen detoxification.





DR. SCOTT'S PERSPECTIVE

Zoe's erratic diet would raise concerns about gut health and possible insulin resistance or polycystic ovary syndrome (PCOS) for Dr. Scott. Diagnosing Zoe with PCOS would require her to have irregular cycles and evidence of high testosterone, which may be indicated by her acne. Dr. Scott would check for additional signs of PCOS, like hair loss or growth. Additionally, Dr. Scott would suspect gut health problems due to Zoe's poor diet and may order a stool test and food sensitivity test and change her diet and/or supplement accordingly.

Dr. Scott's initial care for Zoe would include starting her on fish oil, particularly with high docosahexaenoic acid (DHA), for its anti-inflammatory properties and potential benefits for acne and mental health. Depending on Zoe's bowel symptoms, Dr. Scott would also consider magnesium. In addition, she would check Zoe's vitamin D levels and supplement as necessary.

CASE CONSIDERATIONS

Dr. Scott would ask Zoe about her ability to swallow pills and offer the two prescribed nighttime supplements in pill, powder, or liquid form. Dr. Scott would aim to schedule Zoe's supplements, such as inositol, magnesium, Vitex, and fish oil, at night due to her erratic mornings. She would give Zoe options for either twice-daily or once-daily dosing to fit her routine.

For Dr. Scott, understanding Zoe's diet would be crucial, especially if she cooks for herself when her dad is not home. With Zoe, Dr. Scott would explore healthy alternatives to the foods she likes or consider meal replacements like shakes for more regular eating habits.



Traditional doctors would likely prescribe birth control for Zoe's acne and to regulate her periods, especially if she's sexually active. However, Dr. Scott said it's important to discuss the options and the physiological effects of birth control. While it can help with acne and period regulation, it might not alleviate anxiety and has been shown to increase the risk of depression in teenage girls.

To address Zoe's anxiety, Dr. Scott would introduce practical tools such as lavender essential oil, breathwork, or other techniques Zoe might find useful, acknowledging that meditation may not appeal to her. Personalizing these recommendations to fit her lifestyle and preferences would be a key part of Dr. Scott and Zoe's conversations.



LONG-TERM

Dr. Scott's main goal while treating Zoe would be to determine whether she is ovulating and assess for PCOS, as she exhibits some signs and symptoms. Improving Zoe's acne and anxiety would likely motivate her to adhere to the treatment plan.

Another goal of Dr. Scott's would be to improve the regularity of Zoe's cycles. At 15, it's not uncommon for cycles to still be a bit irregular; however, Zoe's treatment would likely help level them out.

Additionally, understanding any psychosocial factors, such as whether she has received grief counseling or experienced trauma, would be essential for Dr. Scott. She may also suggest integrative mental health therapies like polyvagal therapy, as Zoe may have trauma from her mother's death. ○

DR. PATTERSON'S PERSPECTIVE



Jaquel Patterson, ND, MBA, IFMCP

As a naturopathic physician who works in family medicine, about 40 percent of Jaquel Patterson, ND, MBA, IFMCP's patients are under the age of 18, a growing number of which are presenting with anxiety and depression. With patients like Zoe, Dr. Patterson takes the time to get a detailed health history and find the root cause of their issues, emphasizing the functional medicine philosophy of "test, don't guess."

FIRST VISIT

Dr. Patterson's intake process for Zoe would last about 90 minutes. She would start by focusing on Zoe's three chief complaints and then reviewing her health history over the past one to two years. During the intake, she would try to understand when Zoe's symptoms began and ask her about life experiences, such as when her mother died of ovarian cancer. The intake would also examine Zoe's past illnesses, family dynamics (including therapy history), and hobbies.

In addition, the assessment would review Zoe's family's health history, especially regarding mental illness. Dr. Patterson would investigate environmental factors that could be related to Zoe's health complaints, like moves, life changes, and exposure to toxins. She would also inquire about Zoe's lifestyle, exercise habits, spiritual practices, and social relationships.

CARE PLAN

For Zoe's initial care plan, Dr. Patterson would begin with general bloodwork, particularly focusing on minerals such as iron and ferritin, due to potential deficiencies linked to

Zoe's diet. She would also conduct hormone and metabolic testing, including a complete blood count, a complete metabolic panel, A.M. cortisol (for sleep issues), and a hormone panel, checking levels of FSH, LH, estrogen, progesterone, testosterone, DHEA.

Dr. Patterson would assess Zoe's red blood cell count (RBC) and nutrient levels, including magnesium, zinc, vitamin A, and vitamin D. She would also investigate potential food sensitivities and environmental factors like mold exposure. Additionally, Dr. Patterson may conduct a neurotransmitter test involving urinary tests four times a day to check cortisol levels and neurotransmitters (dopamine, serotonin, norepinephrine, epinephrine, glutamate, and tryptophan).

Depending on Zoe's family's budget, Dr. Patterson would suggest stool testing, focusing on strains like lactobacillus and Bifidobacterium, given Zoe's poor diet and mental health issues. If Zoe's anxiety seemed unrelated to situational factors, Dr. Patterson would consider testing for conditions such as PANS/PANDAS, Lyme disease, and Bartonella.



DR. PATTERSON'S PERSPECTIVE

Dr. Patterson's treatment plan for Zoe would most likely include:
Dr. Patterson's overall goal would be to develop a

Supplements for Cortisol Regulation:

- **NIGHTTIME:** Phosphatidylserine and herbs like magnolia and passionflower to support gamma-aminobutyric acid (GABA), mental health, and sleep.
- **MORNING:** Licorice root to increase cortisol half-life and Rhodiola to support neurotransmitters and energy.



Dietary Adjustments:

- **INCREASE PROTEIN INTAKE** to support neurotransmitter production, considering Zoe has a slightly low BMI.

Hydration:

- **INCREASE WATER INTAKE** to 64 oz per day.

Technology Reduction:

- **REDUCE SOCIAL MEDIA** use by 30 minutes per day.

Mental Health Support:

- **AMINO ACID SUPPLEMENTATION** to support neurotransmitter production.
- **ENCOURAGE PARTICIPATION** in online dance classes to address social anxiety and foster connections.
- **DISCUSS THERAPY HISTORY** e.g., cognitive behavioral therapy (CBT) and support systems with Zoe's father.
- **DEVELOP A PLAN** for increasing social activities and addressing loneliness.

comprehensive plan that addresses both Zoe's physical and mental health, focusing on her diet, lifestyle, and social connections. Dr. Patterson would make ongoing adjustments to the treatment plan based on Zoe's test results and progress.

CASE CONSIDERATIONS

Dr. Patterson strives to meet people where they're at, especially with kids. For instance, if a child is using technology for three or four hours a day, Dr. Patterson does not suggest drastic reductions. Instead, she proposes reducing usage by 15 minutes and then gradually increasing this reduction over time. She also makes sure to explain the reasons behind these changes, often using lab results to demonstrate how high cortisol or norepinephrine levels can impact sleep, hunger, and overall health.

In Zoe's case, Dr. Patterson would encourage taking baby steps, agreeing on small, manageable reductions in technology use. She would also ask Zoe what issue is most pressing for her, which would likely be her acne. This would help Dr. Patterson tailor a treatment plan for Zoe, such as introducing vitamin A for skin health and checking hormone levels. In addition, she would try to understand Zoe's preferences, like whether she prefers liquids or gummies, and her willingness to take multiple supplements, helping to ensure adherence to the treatment plan.

In order for Zoe to follow the treatment plan, her father would have to be equally committed. Dr. Patterson would discuss Zoe's treatment plan with her dad and try to understand what lifestyle and diet changes would be reasonable from his perspective.

LONG-TERM

Dr. Patterson's long-term goals for Zoe would be to regulate her hormones, which are likely out of balance given her irregular menstrual cycles. Proper hormone regulation would be crucial for Zoe's immune function, mental state, and to reduce her acne, moodiness, and anxiety.

Dr. Patterson would also aim to reintroduce joy into Zoe's life by encouraging her to engage in activities typical for a teenager, such as ballet or any other hobbies she enjoys. This also includes fostering friend relationships, attending school daily without discomfort, and reducing social anxiety.

As for her diet, Zoe may not be ready to make significant changes initially. Therefore, Dr. Patterson would focus on incorporating positive dietary changes, such as adding one serving of broccoli or more protein like chicken and meat, rather than limiting her current food choices. Over time, Dr. Patterson would help Zoe move towards a more balanced diet, emphasizing protein-dense and better food choices.

Dr. Patterson's other long-term goals for Zoe would include reducing her technology use to two hours a day, helping her re-engaging in ballet or another preferred activity, increasing her social interactions, and reducing social anxiety. Dr. Patterson added that addressing Zoe's acne would be crucial, as it would increase her self-esteem and comfort in social settings, such as school. ○





DR. GOLDSTEIN'S PERSPECTIVE



Everest Goldstein, M.Ed, MSN, APRN, PMHNP-BC, IFMCP

With a holistic approach to healing, Everest Goldstein, M.Ed, MSN, APRN, PMHNP-BC, IFMCP, is dedicated to improving mental health and reducing its stigma. As a board-certified psychiatric nurse practitioner with a background in functional medicine, Goldstein would tailor Zoe's treatment plan to her individual needs focusing on gut health, blood sugar, and hormone regulation.

FIRST VISIT

For Zoe's first visit, Goldstein would conduct a 90-minute consultation to take an in-depth history. This would involve examining Zoe's life from preconception to the present to identify:

- **antecedents** (predisposing factors)
- **triggers** (events that caused symptoms)
- **mediators** (factors that perpetuate symptoms)

This comprehensive approach would help create a timeline of Zoe's health issues to uncover their root causes. If no previous labs were available, Goldstein would order a comprehensive blood panel, hormone tests, and possibly a stool test to assess gut health.

CARE PLAN

After gathering data from Zoe's lab tests, Goldstein would likely implement the "Five R" approach, a comprehensive gut protocol to address Zoe's hormone imbalances, acne, and mental health symptoms linked to gut health.

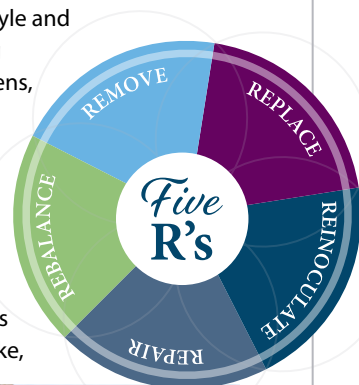
The steps include:

1. **Remove:** Eliminate food sensitivities, toxins, and hormone-disrupting chemicals from skincare, cleaning products, and diet.
2. **Replace:** Add missing nutrients and healthy foods, focusing on balanced intake of fats, proteins, fibers, and essential vitamins like D and B.
3. **Reinoculate:** Reintroduce beneficial bacteria with prebiotics (fiber-rich foods) and probiotics (fermented

foods or supplements). For anxiety, Goldstein might consider psychobiotics, probiotics that specifically impact mental health.

4. **Repair:** Address potential gut lining issues, such as leaky gut, with supplements and foods to improve digestion and nutrient absorption.
5. **Rebalance:** Enhance overall lifestyle and nervous system health by reducing anxiety with magnesium, adaptogens, and better sleep hygiene. Encourage reduced social media use, increased mindfulness, therapy for social anxiety, and physical activity like ballet, even at home.

Goldstein would make sure to assess what changes Zoe is willing to make,





DR. GOLDSTEIN'S PERSPECTIVE

particularly focusing on improving her breakfast habits. She would encourage Zoe to eat a well-rounded breakfast high in protein, healthy fats, and fiber to prevent late-night cravings and avoid the negative hormonal impact of fasting, which increases cortisol. Recognizing that mornings can be busy, or Zoe might not feel hungry then, Goldstein might suggest incorporating morning smoothies as a convenient option to include adequate nutrients.

Additionally, Goldstein would emphasize transitioning to whole foods instead of processed foods, teaching Zoe to shop the outer aisles of the grocery store. Goldstein might also discuss healthy snack alternatives and, if financially feasible, suggest a meal prep service to provide Zoe with more balanced meals that require less effort.



According to Goldstein, developing coping skills and building confidence through therapy techniques like cognitive-behavioral therapy (CBT) could help Zoe change negative thoughts and improve her self-image, facilitating better social connections.

▶ LONG-TERM

Goldstein's long-term goals for Zoe would be to restore gut health, which she believes would directly improve Zoe's hormonal and mental health. According to Goldstein, balancing Zoe's hormones would likely improve her acne, anxiety, and confidence, helping her return to her normal activities like going to school and hanging out with friends.

Additionally, Goldstein would help regulate Zoe's blood sugar to further alleviate her anxiety. She also would want Zoe to build more social connections, exercise more, and establish a better sleep cycle, all of which would support her mental health.

Furthermore, Goldstein would want to collaborate with important people in Zoe's life, such as her father, teachers, and school counselors to create a strong care team that can support Zoe and her health goals. ○

▶ CASE CONSIDERATIONS

Goldstein would help Zoe find self-care routines that she enjoys, whether that be meditation, taking a bath at night, or going on a nature walk. Goldstein would also suggest alternatives to screen time before bed, like reading, playing a game, or doing puzzles. Additionally, Goldstein believes that it would be beneficial for Zoe's anxiety to resume at-home ballet, which could boost her motivation and increase her energy.





ABOUT THE EXPERTS



Jaquel Patterson, ND, MBA, IFMCP

Dr. Patterson is a nationally recognized naturopathic physician, success coach, 3x Amazon best-selling author, and Forbes contributor. She owns a successful multi-disciplinary medical practice, Fairfield Family Health, in Connecticut. She has over 16 years of clinical experience with a focus on Lyme disease, autoimmune conditions, integrative psychiatry and environmental medicine. She is a sought-after speaker and published in places like USA Today, New York Magazine, Forbes, CBC, Fox, NBC and ABC. She has also completed additional post-doctoral training and is certified with the Institute for Functional Medicine and functional medicine for psychiatry and ADHD with Psychiatry Redefined. She is active in leadership within the profession, serving as the past President for the American Association of Naturopathic Physicians and currently serves on the board for the American Academy of Environmental Medicine.



Tara Scott, MD, FACOG, FAAFM, ABOIM, CNMP

Dr. Scott graduated from Northeast Ohio University College of Medicine and completed her residency with Summa Health Systems at Akron City Hospital in Ohio. She recently “retired” from OB/GYN after almost 20 years to focus on functional and integrative medicine. She is an Associate Clinical Professor at Northeast Ohio Medical University, where she teaches OB/GYN residents.

Dr. Scott is a certified menopause practitioner with the North American Menopause Society and a fellow of the American College of Obstetrics and Gynecology. She first became involved with hormone and integrative medicine while practicing as an OB/GYN. Her empathy for patients experiencing hormone-related issues led her to become trained as an advanced fellow and certified by the American Academy of Anti-Aging Medicine. In 2015, she obtained an additional board certification in Integrative Medicine. She has been consulting with other companies in the industry since 2020, offering her knowledge in the hormone/ wellness/ menopause space to help enhance their business.

Dr. Scott is passionate about educating the medical community on the advances in evidence-based hormone therapy. She lectures around the community to raise awareness about wellness and hormone balance. Dr. Scott has been speaking and educating for over ten years and has taught doctors her approach in five continents. For her expertise, she has been featured on The List TV, Women’s Health, Shape, The List, Newsweek, Parents, Authority Magazine, a recent TEDx talk, and on numerous podcasts.



Everest Goldstein, M.Ed, MSN, APRN, PMHNP-BC, IFMCP

Everest is a board-certified psychiatric nurse practitioner with a background in functional medicine. She was born and raised in Dallas, Texas and then obtained her B.A. in Psychology from Princeton University. Following Princeton, she worked for Teach for America as a bilingual elementary school teacher, administrator, and curriculum developer. During this time, she also received her Master of Education from Southern Methodist University in Dallas, TX. Realizing the great need for mental health services in this community, Everest decided to follow her passion and earned her Psychiatric Nurse Practitioner degree at Vanderbilt University. In order to better provide holistic care to her patients, Everest also studied functional medicine through the Institute for Functional Medicine.

Everest works to reduce the stigma surrounding mental health and expand access to care through advocacy and education. She takes a holistic approach to healing and believes in the connection between the body and mind. Integrating lifestyle, diet, medicine, and other innovative technologies, she views each patient individually to help them take control of their health and improve their quality of life and wellbeing.