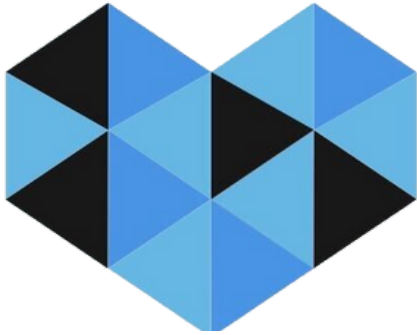



THE PREMED SCENE,  
NOVEMBER 2021



# NOVEMBER 2021 MEDICAL NEWSLETTER



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## A NOTE FROM OUR NEWSLETTER DIRECTOR:

Dear medical newsletter readers,

The year 2021 is nearly over. As always, The Premed Scene is proud to share with you some of the newest in the medical research field! This monthly medical newsletter includes in-depth summaries of not only one, but two of the latest research articles on irritable bowel disease. You will also get to read about the latest in stroke prevention for diabetic individuals. And did you know? Baby teeth are now being used as mental health biomarkers!

I can't express how grateful The Premed Scene is for you - our blog and newsletter readers. Thank you for supporting us by simply taking your time to read what our accomplished content writers have gathered throughout this entire season!

Have fun reading!!  
Yours truly,

*Ryen Belle Harran*

(P.S. Come back in January for the next edition of The Premed Scene's Monthly Medical Newsletter!)



## Specialty Spotlight: General Surgery

Oriana Tolentino

### What is general surgery?

General surgery encompasses the diagnosis and surgical treatment of almost all areas of the body including the head and neck, abdomen, circulatory system, endocrine system, tissues, digestive tract, and others. It is essentially a branch of medicine that deals with a broad range of diseases requiring surgical intervention. Aside from performing the surgical procedures, a general surgeon could order and interpret tests like CT scans in order to confirm the accuracy of one's diagnosis. He/she may also provide care to individuals who have deformities and cancer.



### What are the common surgical procedures in this specialty?

1. Appendectomy: removal of the inflamed appendix cause by infection
2. Breast Biopsy: removal of some abnormal tissues and cells in the breast for diagnosis of the condition through the microscope
3. Coronary Artery Bypass: redirection of blood around the blocked or partially blocked artery to improve the flow of blood in the heart

### Education and Training

1. Undergraduate degree - 4 years
2. Medical School - 4 years
3. General Surgery residency - a minimum of 5 years
  - This must be recognized by the Accreditation Council for Graduate Medical Education. In addition, individuals must accomplish a minimum of 750 procedures (pediatric surgery, organ transplant, critical care surgery, etc.) during this period.
4. State Licensure Exam
5. Board Exam (standardized examination prepared by the American Board of Surgery or American Osteopathic Board of Surgery)
6. Fellowship
  - One may choose to complete a fellowship in any surgical subspecialty to further hone one's knowledge and skills.

**Salary:** General surgeons receive salaries of approximately between \$200,000 and \$400,000 annually.

## Irritable Bowel Syndrome and Antigliadin IgG: Efficacy of a Gluten-Free Diet

Ashlyn Southerland

Do you ever experience constant bloating or gas? Do you feel that you have abdominal pain on a more frequent basis than the average person? Are cramps, constipation, and diarrhea symptoms that you encounter on a regular basis?

If so, you may be one of many people that has Irritable Bowel Syndrome (IBS), a chronic condition that could negatively impact quality of life. Many of the symptoms that are associated with IBS could occur rapidly or unexpectedly, making situations in which a bathroom is unavailable particularly scary for the individual. In addition, even when the affected IBS bowel movement has passed, the pain could still linger in the abdomen for the rest of the day, which could hamper necessary tasks and activities for the inflicted individual.

For many people that have this condition, questions still arise as to what causes this condition to manifest in the first place, as well as ways to treat it. The unfortunate answer is that no distinct "triggers" have been confirmed amongst this widely-tested community. Tests and treatments are conducted through an individual case-by-case basis, and one treatment or plan that reduces the symptoms of one patient may not provide the same results for other patients. Keeping this information into mind, what methods could patients utilize as an attempt to reduce IBS symptoms?

One method that researchers evaluated for IBS treatment is incorporation of a gluten-free diet. They hypothesize that there may be a possibility that many of these IBS patients may have a notable sensitivity to gluten, in which could be solved through consumption of foods that lack the protein. In particular, a prospective study containing 50 patients with IBS, some of which did or did not have serologic reactivity to gluten, tested the effectiveness of a 4-week gluten-free diet regimen. GI transit, symptoms, mental stability, somatization, and dietary habits were many

measures incorporated to test efficacy of the overall diet.

After the diet was implemented for four weeks, data revealed that a high number of IBS patients positively benefited from the gluten-free change. In particular, researchers noted that AGA seropositivity could be used as a biomarker for IBS patients that have higher likelihood of presenting symptoms, supporting the determination of use for this method.



Pinto-Sanchez, M. I., Nardelli, A., Borojevic, R., De Palma, G., Calo, N. C., McCarville, J., Caminero, A., Basra, D., Mordhorst, A., Ignatova, E., Hansen, S., Uhde, M., Norman, G. L., Murray, J. A., Smecuol, E., Armstrong, D., Bai, J. C., Schuppan, D., Collins, S. M., ... & Bercik, P. (2021). Gluten-free diet reduces symptoms, particularly diarrhea, in patients with irritable bowel syndrome and Antigliadin IgG. *Clinical Gastroenterology and Hepatology*, 19(11), 2343-2352. <https://doi.org/10.1016/j.cgh.2020.08.040>

# Connecting Stress and Crohn's Disease

Aprile Bertomo

Three exams. Two essays. Four mini quizzes. In one week. As the work continues to pile up, you begin to panic, and feelings of stress overtake you. However, you may want to think twice before letting that stress get the best of you. According to a recent study performed by Shaler et al., 2021, stress has been found to be linked to Crohn's disease as a result of the mediating variable of bacteria of the gut microbiome.

(1)



"...stress has been found to be linked to Crohn's disease as a result of the mediating variable of bacteria of the gut microbiome."

Crohn's disease is defined as a type of autoimmune disease that is characterized by GI tract inflammation. It is a form of inflammatory bowel disease that can involve constipation, diarrhea, and fatigue. In the past, it was observed that individuals who ended up having Crohn's disease exhibited inflammation and more enhanced disease activity that often resulted following feelings of psychological stress. Such an understanding established the basis for Shaler et al., 2021 in evaluating the relationship between psychological stress and Crohn's disease. (1,2)

In their study, Shaler et al., 2021 exposed mice to overnight restraint stress, which was made up of depriving the mice of both food and water. Over time, the mice exhibited a greater amount of Enterobacteriaceae- the presence of which has been correlated with inflammatory bowel disease, as shown in previous observations. To further their experiment, the researchers colonized AIEC, or adherent-invasive E. coli, within some of the mice. AIEC was found to be in higher amounts in patients with Crohn's disease. The combination of psychological stress and AIEC allowed scientists to evaluate their hypothesized correlation. (1,2)

In the mice exposed to both AIEC and overnight restraint stress, CD45+CD90+ cells, which aid in the development of a cytokine called IL-22 that allows for proper functioning of the gut wall, were depleted as a result of stress hormones. Consequently, the researchers were able to discover a type of mechanism for Crohn's disease. To further support these conclusions, the researchers realized that in providing these same mice with a type of treatment that increased IL-22 levels, AIEC was prevented from expanding and stress hormone damage was rectified. (1,2)

With regard to the clinical implications of such results, Dr. Coombes, one of the researchers in the study, noted that, in order to treat Crohn's disease, a treatment to increase IL-22 levels could be helpful. However, it was also suggested that the production of a type of antibiotic to perform selective inhibition of the bacteria associated with Crohn's disease could also be helpful. (1,2)

## References:

1. <https://www.medicalnewstoday.com/articles/crohns-how-stress-may-increase-disease-associated-bacteria-causing-flare-ups>
2. <https://www.nature.com/articles/s41467-021-26992-4>

## Diabetes Awareness Month: Stroke Prevention for High-Risk Diabetic Individuals

Ilana Saidov



Diabetes and stroke are two of the multiple severe health conditions that impact many individuals yearly. An individual with both of these health conditions is at a higher risk of cardiovascular issues and increased mortality. Thus, since diabetic patients have high sugar levels in their blood, causing their blood vessels to stiffen, blood clots that form can travel to the brain and cause a stroke. Therefore, it is vital to implement public health strategies to lessen the number of these cases. Additionally, we must improve the overall surveillance of diabetes since diabetic individuals are at an elevated risk of experiencing strokes.

Overall, diabetic individuals have an increased risk of experiencing cardiovascular events, stroke recurrence, TSA, and poor neurological outcomes. There has been a lack of defined treatment for patients with diabetes who have experienced a stroke, so it is imperative to bring awareness to this medical issue. Collaborative management between primary healthcare physicians, internal medicine physicians, and neurologists is needed to combat this issue. In addition to collaboration, there has been a lack of glucose control in stroke treatment for diabetic patients. Specifically, glucose control for patients who suffered a stroke was not recommended since it did not improve ant neurological functions. Instead, it increased the risk of intracranial hemorrhage and hypoglycemia.

A new public health approach was introduced to combat both of these health conditions. The process is centered around glucose monitoring to reduce prevalence, disability, and overall disease burden. After being monitored, all patients will be categorized into high, moderate, and low-risk groups. The ranking will then be used to determine which patients require anti-diabetic medication and lifestyle management.

Each country has even provided a unique public health strategy to prevent diabetes and stroke for high-risk patients. In the UK, social prescribing connects patients with local and social services necessary to improve their health. The three SP projects, light, medium, and holistic, are used as preventative measures to improve long-term health conditions by referring at-risk patients to their designated programs. For example, a patient in the SP medium program prescribed regular exercise will be provided with the necessary information and advice regarding exercise, diet, and mental health support.

Each new strategy is centered around informing local communities about symptoms of diabetes as well as increasing awareness about post-stroke rehabilitation. This educational and inclusive approach aims to inform impacted individuals about their overall health, alleviate their concerns, and build health systems that are beneficial to their healthcare needs.

### Source

[https://www.researchgate.net/publication/356039775\\_Stroke\\_in\\_Patients\\_with\\_Diabetes\\_Is\\_It\\_Time\\_to\\_Expand\\_Public\\_Health\\_Priority\\_to\\_Encompass\\_High-Risk\\_Patients\\_with\\_Increased\\_Insulin\\_Resistance](https://www.researchgate.net/publication/356039775_Stroke_in_Patients_with_Diabetes_Is_It_Time_to_Expand_Public_Health_Priority_to_Encompass_High-Risk_Patients_with_Increased_Insulin_Resistance)

# Baby Teeth: Novel Biomarkers of Mental Health Disorders

Oriana Tolentino

In this generation, there is still a lack of reliable, effective, and inexpensive equipment that could aid in determining the possible development of mental health disorders in children when they are exposed to certain traumatic and painful experiences in the early stages of their life. In addition, some reports and documents may still have insufficient data regarding the occurrences, gravity, and duration of such psychosocial exposures. Therefore, a group of researchers decided to conduct a study to address this issue and to discover a new type of biomarker. This may also allow the children to receive proper intervention strategies to prevent the emergence, progress, and exacerbation of mental health disorders.

The study entitled “Association of Maternal Stress and Social Support During Pregnancy With Growth Marks in Children’s Primary Tooth Enamel” was published in *JAMA Network Open* on November 9, 2021. As far as the researchers are aware, this is the first attempt to display the connection between psychosocial stressors experienced by the mother and features of her child’s teeth. The researchers collected 70 primary or exfoliated teeth (specifically canines) and investigated the neonatal line (NNL) through a microscope. Afterwards, the mothers were asked to accomplish forms about the four variables that may impact their children’s developmental aspects. These include stresses during the prenatal period, quality of neighborhood they are residing in, history of mental health conditions, and social support received.

According to the research, teeth are just like trees in such a way that they both produce permanent growth lines reflecting their age and experience. Through such, baby teeth may serve as a gateway for individuals to catch a glimpse of the infant’s childhood experiences. The depth and thickness of the stress lines would depend on the mother’s history of depression and anxiety as well as the environment in which the baby grew up in the utero.

The neonatal line or the NNL may allow one to determine if the mother has any history of mental health conditions or has experienced psychosocial stressors during the pregnancy and the time after birth. Experiencing stressful prenatal and perinatal situations may result in wider NNLs of the baby’s teeth.



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The researchers discovered that children with mothers who are experiencing severe anxiety and depression during the pregnancy had thicker NNLs while the children with mothers who had received social support had narrower NNLs.

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