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# CHOATE PUBLIC HEALTH

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# FROM THE EDITORS

Dear Readers,

Welcome to the first issue of Choate Public Health for the 2018-2019 school year!

This magazine was founded last winter with the hopes of spreading awareness of significant public health issues across campus. Through our engrossing articles and intricate graphics, we strive to create easily approachable and understandable content.

This issue is an assortment of lighthearted and heavy topics that are especially relevant to the Choate community. We hope that our articles can spark discussion or deeper thought regarding these matters.

If you are interested in public health or writing, feel free to reach out to us!

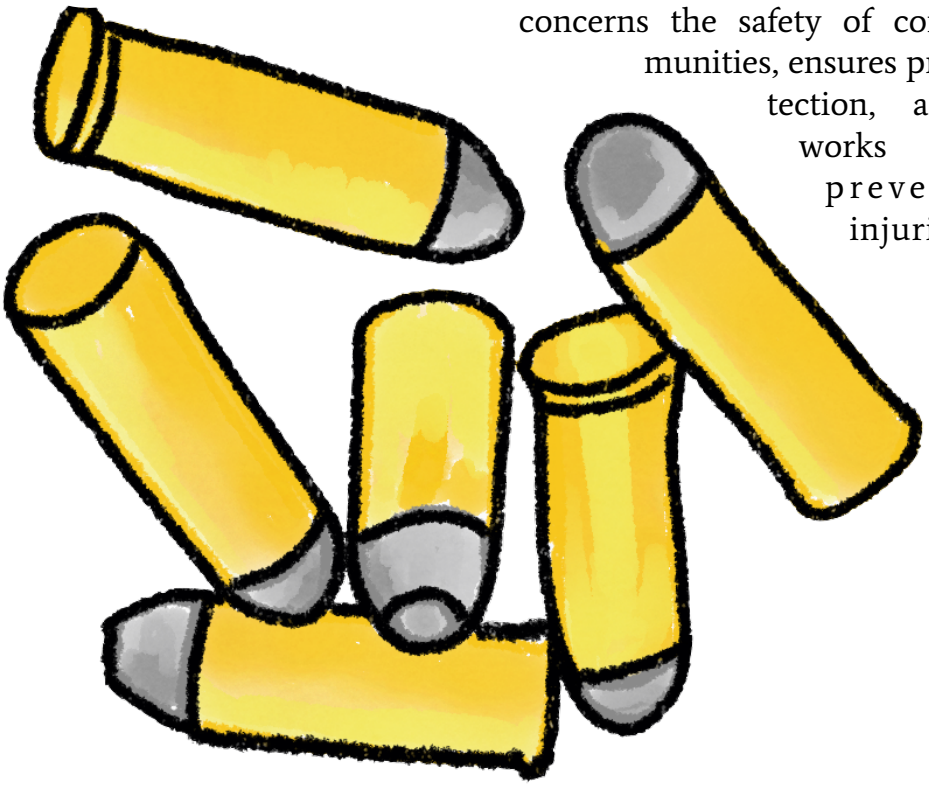
Sincerely,

Ariel Hyunseo Kim and Khushi Tyagi

# THE EXCLUSIVELY AMERICAN DISEASE

By Raine Williams '20

The leading cause of premature death in the United States is the unseen epidemic, a blanketed public health issue. This crisis kills 96 Americans on an average day, injures 100,000 Americans in a year, and leaves 32,000 of them dead. In 2014, the lives of 3,000 American children were ended. Roughly 75 preschoolers die every year.[1] This is a disease that does not discriminate. Presenting danger to our communities, schools, and homes, no one can hide from this never-ending threat. Gun violence is accountable for the deaths of thousands of Americans. It is a public health issue still awaiting a solution.



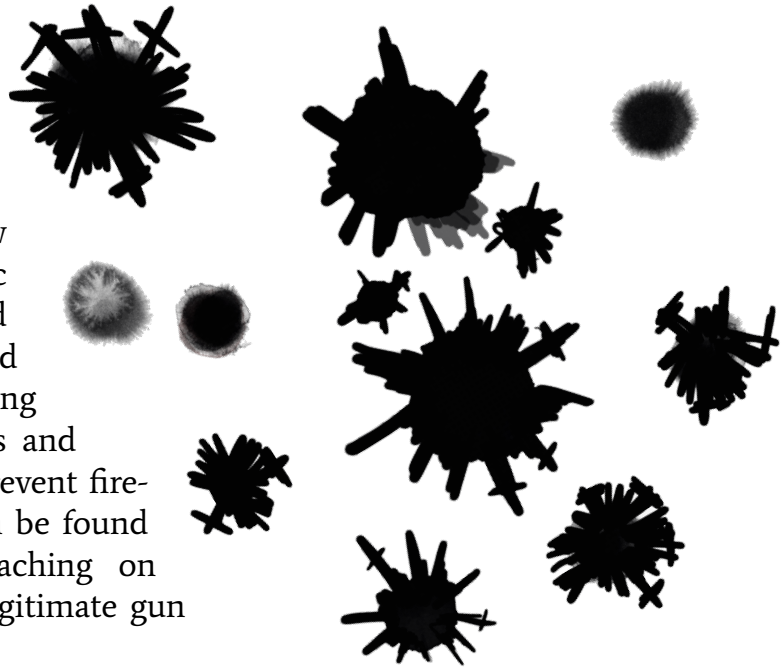
What exactly is a public health issue? Public health concerns the safety of communities, ensures protection, and works to prevent injuries and diseases. A good example of a public health issue is the Ebola outbreak. In 2014, Ebola spread into the United States, causing the public health community to act with extreme urgency. "[The United States] had an evidence base for the disease because [they] had studied it. Ebola was tracked, prevention measures put in place. Every health department in the US was put on alert."[2] There were 11 cases of Ebola and two deaths in the United States. In 2014 alone, 33,000 people died from gun violence. Since the Sandy Hook school shooting, 400 Americans have been killed or injured in more than 200 school shootings.[3] If the measures that were put in place for the Ebola outbreak had been applied to the years of gun violence that America has suffered from, so many lives lost could have been saved. "We should track it, find the root causes, use science to find research gaps, create pol-

icy solutions, and use mass public education campaigns to eradicate the threat."[2]

Then why hasn't the US government taken a public health approach to gun violence already? This is because since 1996, there has been a ban on federal funding related to gun violence prevention research, deeming the research politically motivated. Due to this ban, the US has already lost over 20 years of possibly life-saving research. For instance, there is a lack of data on gun violence. For motor-vehicle deaths, a database called the Fatality Analysis Reporting System tracks in minute detail the incidents of motor-vehicle deaths nationwide. No comparable database exists for gun deaths — basic questions like exactly how many households own guns remain unanswered.[4]

In recent years, however, many medical and public health professionals have been pushing back against this ban — in 2016, more than 100 medical organizations signed a letter to Congress asking to lift this ban. Even Jay Dickey, the congressman who sponsored the actual ban, came to regret his decision. Before he passed away last year, he co-authored an article with Mark Rosenberg — the very CDC official who he had contended against before passing the ban — arguing for more gun-violence research.[4] Dickey and Rosenberg wrote, "We were on opposite sides of the heated battle 16 years ago, but we are in strong agreement now that scientific research should be conducted into preventing firearm injuries and that ways to prevent firearm deaths can be found without encroaching on the rights of legitimate gun owners."[5]

Amidst the recent gun-related tragedies and casualties arises the political controversy surrounding gun control — some argue for the necessity of gun control for the sake of safety, while others assert that gun control is an infringement of individuals' rights. However, before attempting to decide between two polarized values of this country's people, the US government has the responsibility to protect them. As Georges Benjamin, the Executive Director of the American Public Health Association (APHA), puts it, "We're not debating the constitutionality of guns. What we want to do is work to make people safer with firearms, the firearms themselves safer, and our society safer with firearms in the environment."[2]



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# Q&A WITH SOPHIA KAUFMAN '13

By Ariel Kim '20

*Sophia Kaufman '13 graduated this year from Harvard University with concentrations in social anthropology and global health/health policy. Her experiences working with people in various marginalized communities such as Native Americans and prisoners have fortified her passion for public service, specifically for equal healthcare access and quality healthcare. Next year, she will be completing her Master's at the University of Cambridge, continuing her studies in public health and medical anthropology. Through this interview, Kaufman has provided invaluable information to Choate students regarding not only her experiences as an esteemed Choate graduate but also the importance of public health.*

**CPH: How would you define public health?**
Kaufman: To me, public health is the study of a population's health. I believe that this health study and work cannot be sustainable or effective if it does not account for culture, environment, and history. For equitable public health, the voices of the communities themselves must be heard and they should really be the leaders towards improvement.

**CPH: How did you first become interested in public health?**
Kaufman: I have been inspired to work on health projects that are deeply connected to "home." The opioid epidemic is a public health issue that has affected so many people across the U.S. especially in Appalachia. Being from West Virginia, I primarily focused on this health crisis for my public health study and my senior year Harvard thesis. Known as the "health crisis of our generation," the opioid epidemic killed more than 60,000 people in 2016 alone. In West Virginia — which has the highest rate of death due to overdose of any state in the country — the effects of this health crisis have been devastating. Doing research in West Virginia, I worked with the health department, fire department, doctors, and patients to look under the surface at the issue. I wrote my 130-page thesis in an attempt to expand a biomedical understanding of pain and suffering to uncover the complexities of the opioid epidemic in West Virginia. Through ethnographic fieldwork and anthropological theory, I analyzed how social and cultural factors as well as historical context have played an integral part in the creation of pain and suffering in West Virginia. Additionally, I exam-

ined how factors like hopelessness and stigma play a pivotal role in the compound epidemic. I wrote the thesis, hoping to improve the understanding behind the causes of and successful treatments for the opioid epidemic. And from my experiences, I believe the opioid epidemic is the result of covering pain, not treating it.

**CPH: What are some current public health issues that interest you most? Why?**
Kaufman: In addition to my work related to the opioid epidemic, I have interests in community health, tropical medicine, and epidemiology. I have worked on long-term research projects in these areas for the Global Fund in Geneva, Switzerland, and Fort Peck Native American Reservation's Health Promotion and Disease Prevention Unit in Montana. I have also had the opportunity to work internationally in health with Support for International Change, a local Tanzanian NGO. There I was an HIV/AIDS educator and researcher for the summer after my freshman year of college.

**CPH: For those Choate students who may be interested in pursuing a career in public health, what advice might you offer? What kinds of opportunities are out there for high school students to obtain some experience in the public health field?**
Kaufman: I would say have as many varying experiences in health as you can (especially in different cities or countries which offer diverse environments and health burdens). I would also emphasize how important and formative it is to build relationships with people in health fields — professors during early college years can be incredible resources and mentors. For high schoolers, this also applies. Reach out to people who do work that sounds interesting in health around you and see if there are volunteer opportunities, ask for their suggestions, and talk to people who are already in the field!

**CPH: What was your favorite Choate memory?**
Kaufman: Honestly, my favorite Choate memory was the Physics Phlotilla my sophomore year. I really thought our boat wouldn't sink. But it sank.

**CPH: How do you think Choate has shaped your interests/pursuits?**
Kaufman: The Choate community gave me so much. The teachers I had at Choate taught me how to write, do research, and harness my creativity. I was able to dabble and work in so many different areas that allowed me to move towards where I am today. The friends and people I met there will be lifelong friends. But it was not easy, Choate pushes you a lot. So to you all: this is the hardest part. It pays off!

# MAKING SENSE OF MENTAL ILLNESS

By Nico Decker '20

There is much disagreement among psychologists regarding the topic of mental illness. However, most mental health professionals would agree that two main psychological elements characterize the mentally unwell: mental distress and pain, and the lack of the ability to utilize mental resources in a desired way. The mentally ill cannot reach their full potential for personal and professional growth, and this has a negative impact on society as a whole. Because of this large societal impact, psychologists strive to make proper sense of mental illness. There are five comprehensive models of mental health that have been widely used to try to understand such experiences.

One – spiritual. As the oldest explanation, this model connects the conscious experience to a supernatural or religious power. This model might suggest that a schizophrenic has been possessed by the devil to explain bizarre behaviors.[1]

Two – moral character. This model takes the position that people need to learn morals and virtues such as fortitude, honesty, and compassion. These morals enable a person to live an ordinary and admirable life. From this perspective, a mental illness may be explained by a person's lack of morals.[1]

Though these two beliefs are common among lay people, they are devalued by modern mental health professionals. There are three newer theories to explain

mental illness that have widespread acceptance today.[1]

Three – sociological or societal perspective. This model focuses on societal constructs by asking questions about what constitutes mental illness and who is authorized to proclaim which individuals are mentally ill. Different cultures label and treat mental disorders in different ways. In its most extreme form, this model denies the existence of mental illness whatsoever by arguing that the mentally ill are deviants from societal expectations.[1]

Four – neuropsychology. This model observes that humans are organisms whose functions are designed by our genetics, and that any mental illness is just a breakdown of these functions or a chemical imbalance. For instance, according to this model, paranoid schizophrenia is a breakdown of the brain's information processing center in the same way that a heart attack is a biological disease caused by the breakdown of the functions of the circulatory system. Because mental illnesses are simply biological issues, psychiatrists would prescribe medicine to fix the problem. Neuropsychologists and psychiatrists classify mental illness as a disease and attempt to treat and fix mental disorders using drugs.[1]

Five – learning and developmental psychology. Developed by theorists like Erikson, Freud, Piaget, Kohlberg and many more, this theory claims that individuals develop along a pathway as they mature, and attempt to adapt to the environment around them. There are developmental tasks that must be successfully fulfilled, or a higher risk of dysfunction and distress in the form of mental illness will result. Some illnesses build slowly, some are episodic, some develop in childhood, and some develop later on.[2] The adolescent and early adulthood developmental periods are especially important to healthy emotional development. During adolescence, individuals experience major changes that have long-term influence on their mental wellbeing. Identity formation could be disrupted, and social needs may not be met. Without successfully completing developmental adolescent stages, an individual may never be able to develop into a functioning adult.[3]

Mental well-being is important over one's entire lifespan, so the promotion of it is relevant regardless of what stage one is in. Effective mental health education leads to more a more fulfilling life and offers an opportunity to prevent and intervene early on.

At Choate, there are various mental health resources available for students. The Health Center offers free therapy and counseling. Choate is far ahead of many other institutions. Only 29% of adolescents choose to contact a professional service for health or education services. Mental health is something Choate students need to be well-informed about, for adolescence is a critical period for one's mental well-being.[4]

When examining mental illness, one should take into consideration each of the five different models. The most well-rounded and comprehensive view of mental disorders comes from developmental psychology. However, this does not invalidate any of the other models. The ability to see mental illness from many different angles is what will allow psychologists to continue to expand their studies and ultimately help people.

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# BE GONE, FLU

By Yuting Wang '20

Keeping healthy during the seasonal plague that burns its way through Choate at least once every year can certainly be a challenge. Here are a few strategies for you to keep from getting sick this flu season:

*1. Wash your hands*

With flu season comes (inevitable) germs. Everywhere in a dorm — the common room, refrigerator, door knob, and sink — germs may be found. Germs are spread through contact. Rid yourself of these pesky germs by washing your hands with soap!

*2. Drink water*

Keep yourself hydrated and drink an appropriate amount. Water is important for your body in general, as well as in preventing sickness. Proper hydration prevents viruses from entering your body by keeping the mucous membranes ("thin layers of moist tissue that line body cavities and secrete mucus, which the protect the respiratory tract from viruses, germs and bacteria") of the nose and throat soft.[1]

*3. Sharing is not caring*

When you suspect either yourself or your roommate of being ill, *go to the health center.* Prevent the spread of your illness to your friends and classmates by removing your personal germs from the equation and recovering in the health center. This is the best way to keep the entire school as healthy as possible during flu season.

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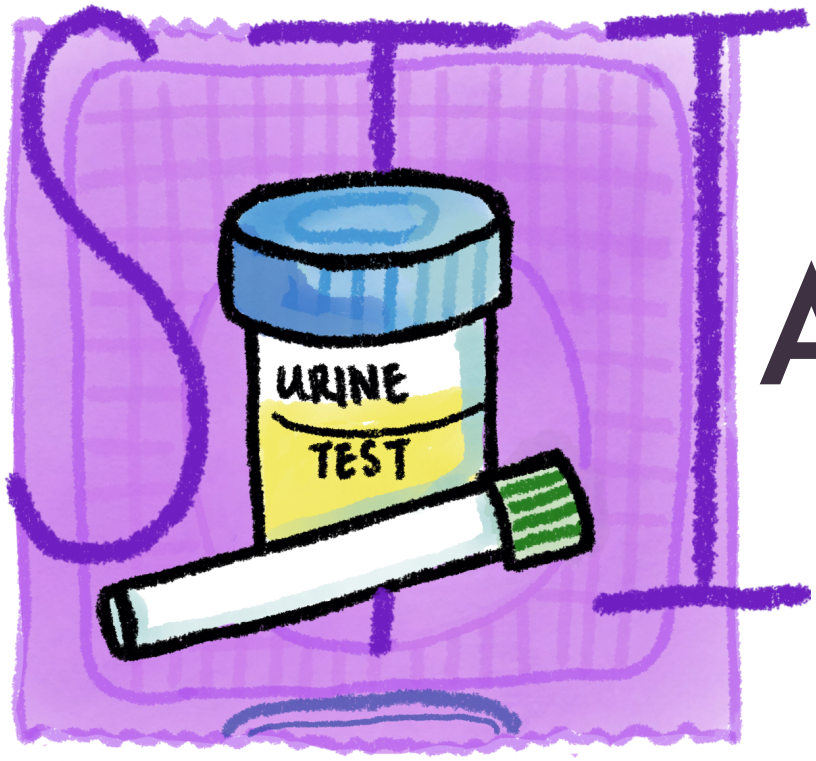


# STIs: A SILENT THREAT

By Deanna Tan '20

Young adults (people aged between 15 to 24 years) are estimated to contract half of all new sexually transmitted diseases (STDs).[1] The term STD refers to diseases that are transmitted sexually and manifest themselves into a disease along with symptoms. However, not all people who are infected by something sexually transmitted (through oral, anal, or vaginal sex) will demonstrate symptoms or have their infection develop into a disease. This is referred to as a sexually transmitted infection (STI).[2]

Ms. Karen Klein, Associate Director of Health Services, says that students have access to testing services in the Health Center that will screen for STIs. In order to get tested, a student should go to the health center and ask to be screened. The student will then be asked to urinate into a cup and the Health Center staff will take care of the rest. If the test comes out positive, the student will be given antibiotics to treat the infection.

STIs, by definition, do not have many visible symptoms. It is therefore easy to have one yet be completely unaware. The Centers for Disease Control and Prevention (CDC) recommend frequent screening for sexually active people.[3] Getting tested for STIs, and remaining knowledgeable of one's sexual health, is a required part of being a responsible and safe sexual partner. Ms. Klein encourages everyone to stop by the Health Center in order to find out more about STI screening and treatments.

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# A VISION OF HOPE

By Elaine Zhang '21

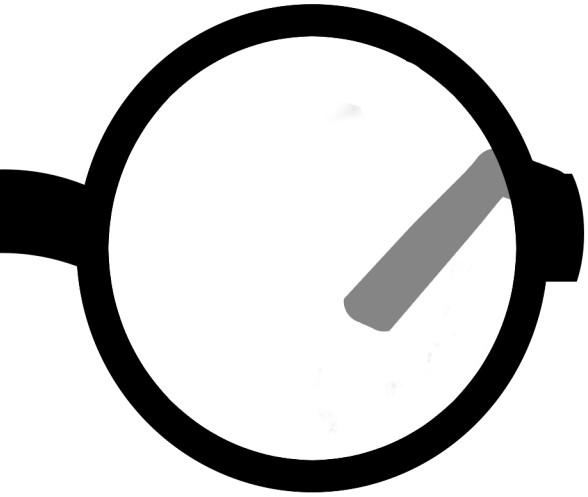
A normal human being is able to see the whole spectrum of colors — from red to violet. However, for some people, these colors are perceived differently or not at all. This rather common condition, affecting millions around the world, is called color blindness, and can be a huge disadvantage for some. While there is no cure for color blindness, researchers have now found a way to increase color perception in color blind people.

The human eye sees certain wavelengths of light reflected by atoms. The wavelength of the light determines color. The retina, a thin layer of tissue in the back of the eye, contains light-sensitive cells known as photoreceptors. Some of these photoreceptors are shaped like cones and are named as such. Cones are responsible for the majority of color vision. Photopigment molecules inside the cones absorb light, triggering an electric signal sent to the brain with a chemical change. There are three types of photopigments: red, green, and blue. All cones contain one of these photopigments and are responsive to a wide range of light wavelengths. Each photopigment is particularly sensitive to corresponding wavelengths but can still send an electrical signal, albeit weaker, to other light. By compiling and comparing the electric signals of the three types of cone cells, the brain is able to see a certain color. This process is critical to the brain's ability to distinguish between the many shades of a color.[1]

Color blindness typically occurs when gene defects either prevent the production of a type of photopigment or change the wavelength response range of a cone. This causes the affected person to perceive colors very differently from the average person; color blind people often have trouble distinguishing between different shades or colors. The severity and extent of color blindness varies greatly depending on the defect, with the most common being red-green color blindness. While milder cases of color blindness may not affect daily life at all, more severe color blindness can cause many inconveniences.[1]

Although there already are ways to help correct color blindness, many of these options are often expensive or inconvenient. Recently, scien-

# FOR THE COLORBLIND



tists at the University of Birmingham discovered that soft contact lenses dyed with an inexpensive, non-toxic dye could possibly improve color perception.[2] The dye is derived from rhodium, a silvery-white metal known for its low reactivity, and is able to absorb certain wavelengths of light. Research shows that the dye could help separate red and green wavelengths by absorbing some of the wavelengths in between. As mentioned previously, cones respond to a wide range of wavelengths, and often, these electrical responses overlap, which causes confusion and difficulty distinguishing colors for those with colorblindness.[3] By eliminating some of these more troublesome wavelengths with the dye, the user should be able to better differentiate red and green. In the experiment conducted by the University of Birmingham, after the lenses were stained with the rhodium derived dye, testers with red-green blindness were asked to look through the lens on a glass slide to see if their color perception changed. Positive results were reported by the group overall, proving that the dyed lenses improved color vision.[4]

Research will continue in order to expand the usability and effectiveness of the lenses, and clinical trials are also expected to start soon. This technology, if proven useful at improving color perception, offers assistance for color blindness that is not only safe but also affordable.

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# MYTHBUSTERS: MEDICAL LEAVE


By Khushi Tyagi '20

*Occasionally, Choate students see some of their peers partaking in medical leave or even consider taking this break themselves. Ms. Karen Klein, Associate Director of Health Services, and Mrs. Judie Bender, Associate Director of Counseling, believe that it is crucial for students to understand what medical leave is and to reach out for help if they may need it. Ms. Klein and Mrs. Bender have answered a few of the most commonly asked questions regarding Choate's medical leave system.*

**CPH: What is medical leave?**

Ms. Klein & Mrs. Bender: Medical leave is not dismissal or withdrawal. The goal of the leave is to strengthen the student so that he/she may return to campus. Most students return to campus after a leave; others choose to take a different path. This is part of the journey for each individual student and his/her own needs. There are many reasons a student may take a medical leave. For example, a student with a concussion that is very slow in healing or has an illness that requires a long recuperation process or prolonged hospitalization may result in taking medical leave. Sometimes a boarding student may stay in school if they are able to be a day student, and return to the care of their parents or guardians in the evenings. Sometimes a student may need to have a leave from sports or other activities in order to get needed treatment. Sometimes a student has severe depression or anxiety that requires intensive treatment that cannot be managed in the boarding environment.

**CPH: How is medical leave assigned?**

Ms. Klein & Mrs. Bender: Sometimes a health issue is so significant that students cannot manage on campus even with all these supports in place. In those rare cases, a student may take a medical leave in order to get more extensive and intensive treatment. The goal is to get the help they need so they can become healthy and return to school.

**CPH: What does a student do on medical leave?**

Ms. Klein & Mrs. Bender: A student on medical leave may go to a different school, work with tutors, or be enrolled in a special academic program to continue their studies. Depending on their individual circumstances, a student may be able to participate in athletics and other creative pursuits or activities.

**CPH: How can a student reach out for medical (physical or mental) attention?**

Ms. Klein & Mrs. Bender: It is easier than you may think to get the help you need. A student may not know what he/she needs, but may feel like something is wrong. We can help figure that out. Any student in our community may come to the health center for any reason. Someone is available to talk 24 hours a day and seven days a week who can get a student connected to the right person for help. We encourage students to reach out for any concerns that they may have and students may do so by contacting the health center.

**CPH: What is the biggest conception about medical leave?**

Ms. Klein & Mrs. Bender: It is incredibly important that students understand that medical leave is not a dismissal. It is a leave. A lot of thought, consideration, work, and support goes into figuring out medical leave with a student and his/her family. It is an opportunity for the student to remain connected to the school while also getting the help they need with the goal of returning to campus. The Health Center stays in contact with the student and family for the duration of the leave. The leave is available so that students can get the support they need and return to school stronger and healthier and able to meet the demands of the boarding environment.


If you would like to learn more about medical leave or medical facilities at Choate, please contact the Health Center.
Phone Number: 203-697-2203
Ms. Karen Klein: kklein@choate.edu
Mrs. Judie Bender: jbender@choate.edu

# ALLERGIES: A CHRONIC DISEASE

By Vidhya Pathy '20

With 50 million sufferers in the U.S. and millions more worldwide, allergies are the 6th largest cause of chronic illness.[1] One can have allergies to a variety of agents, such as nuts, shellfish, pollen, or pets. A dramatic rise in the incidence of allergies in children under the age of 18 since 1997 has significantly affected Generation Z, the generation consisting of the tweens and teens of today.[1] Hay fever, an allergy caused by pollen or dust and that irritates the eyes and nose, is on the rise. As a result of longer and more intense allergy seasons caused by climate change, hay fever shows no signs of ceasing to spread.[2] There is no lack of over-the-counter and prescription solutions to this epidemic, but many natural approaches have been forgotten. Allergies have become significant in today's world, which begs the question: what are allergies?

Allergic reactions take place when immunoglobulin E, which are proteins produced by the immune system, binds with a high affinity receptor called FCER1 that resides on mast cells (cells found throughout the body that release inflammatory substances). The mast cells release histamine, a compound that responds to allergic reaction through contraction of muscles and dilation of capillaries, which in turn affects different parts of the body differently. Antigens are the toxic substances in the body that immune responses attempt to fight. Depending on how many antigens and where the antigens entered into the body, the reaction can go three separate ways. First, if the particles of histamine were released in the gastrointestinal tract, it would cause an increase in fluid secretion and involuntary constriction and relaxation of the muscles (peristalsis) which essentially speeds up the process of bringing the consumed food to the upper gastrointestinal tract.[3] Once in that part of the tract, the body will do its best to expel the antigen, usually through diarrhea or vomiting. Second, mast cell activation in the airway is very different. The pathway gets smaller in diameter and mucus production is increased. This leads to congestion, wheezing, and increased mucus secretion from the eyes and nose. The third and final activation sequence takes place in blood vessels. The initial reaction manifests in an increase of blood flow which causes increased fluid in tissues and increased effector response. One manifestation of this is hives.[3]

The most common remedies for allergies are antihistamines. Antihistamines keep histamines from producing various harmful responses in the body by blocking the receptors that mediate the cellular effects of histamine. Antihistamines come in the form of shots, pills, and liquids. They are common antidotes to common problems, but in a world where people resort to pills for every small-scale ailment many people are left wondering: is there a way to fix this problem without the use of medicine and its irritating side effects like lethargy?

This natural approach has worked for centuries. In Eastern medicine traditions, the first long-term fix for allergies is a change in diet. Recent studies have concluded that omega-6 fatty acids and oleic acid, both found in red meat and dairy, tend to make allergies worse. Naturopathic physicians suggest including more omega-3 fatty acids in replacement for the omega-6. The ideal diet for combating allergies is made up of whole grains, dark leafy vegetables, and egg yolks. One should also include cold-pressed flax oil or evening primrose oil as well as oily fish such as cod, herring, mackerel, salmon, menhaden, and sardines which provide the omega-3 fatty acid. Pineapple, papaya and turmeric all contain anti-inflammatory enzymes which are helpful elements in the fight against allergies.[4]

A complete diet change may seem radical. However, there are many smaller lifestyle changes that can be implemented with ease. Vitamin C is a natural anti-inflammatory that can supplement one's diet. Vitamin B5 also contains anti-allergic properties.[4] Whether at a pharmacy or through a change in diet, the millions of sufferers from allergies can counteract the disease through the remedy they prefer.

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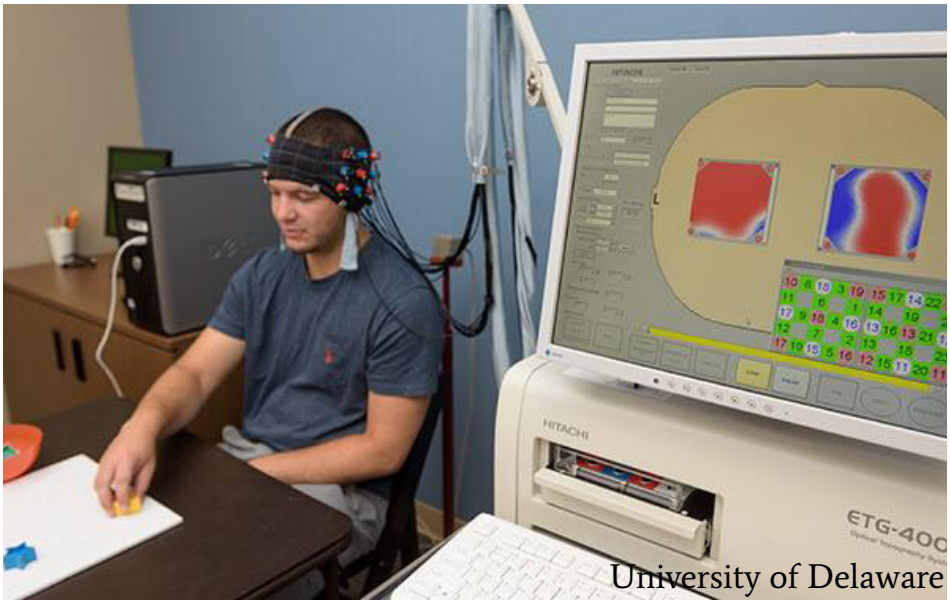
# A CLEARER PICTURE OF CONCUSSIONS

By Eilidh Dunsmore '19

In the United States, high school football makes up 47% of all reported sports concussions — more than 30% of which occur during sports practice.[1] In March, former NFL players Nick Buoniconti, Harry Carson, and Phil Villapiano called for an end to tackle football for children under the age of 14, citing the increased risk of repeated head trauma.[2] Concussions are one of the most talked about sports injuries with good reason: during any given season of a contact sport, a player has anywhere between a five to 10% chance of getting a concussion.[3] However, there is still no universally accepted way to medically image a concussion, and common detection technology for concussions such as the King-Devick test, BrainScope's EEG technology, as well as Choate's own ImPACT test, are all limited in that they all rely solely on single symptom diagnosis like eye movement, brain waves, or a test-retest variance (showing different results to tests taken pre- and post- contusion). Single symptom diagnosis can be heavily impacted by environmental conditions like fatigue or headaches, and often prove completely ineffectual for diagnosing mild concussions.1 The world lacks a method for diagnosing concussions that is both reliable and convenient — something that scientists like Jeff Dunn, PhD, a professor at the University of Calgary, hopes to change.



University of Delaware

Dunn and his team have developed an imaging system that uses light to detect damage in the brain caused by concussions. This portable system, known as Near-Infrared Spectroscopy (fNIRS), measures oxygen levels and notes major discrepancies in the established patterns. In a brain that is functioning normally, both sides of the brain are communicating and have patterns of blood flow and oxygen levels that are similar. However, when a traumatic brain injury has occurred (even a minor one), those similar patterns become variant.[4]

NIRX

In order to image the brain with fNIRS, a cap containing small lights with sensors connected to a computer is placed on top of the head. When the lights are switched on, researchers are able to observe and measure brain activity. So far, the device shows promising ability in detecting changes in brain activity within the researcher's subject group: adults with long-term symptoms after a concussion. Keith Yeates, PhD, the lead for Calgary's Integrated Concussion Research Program (ICRP), claims that, "The fNIRS device has the potential to provide a convenient method for helping detect concussion."[4] The most important aspect of the fNIRS device, however, is that it is both a portable and non-invasive method of diagnosing concussions. Should the early success of the fNIRS device continue, the general public might one day be able to utilize this technology right out on the sports' field.

Until that day, concussions are still a rampant problem for people all around the world, particularly for athletes. There is a reported one in five likelihood of sustaining a concussion as a high school athlete during any given season. Football, while bearing the brunt of the blame with 64 to 76.8 players per 100,000 athletic exposures (defined as "participation in one organized high school athletic practice or competition"), is followed closely by boy's ice hockey (54), boy's lacrosse (40 to 46.6), and girl's lacrosse (31-35).[5] In order to reduce instances of concussions, rules preventing illegal contacts, checking, tacking, or colliding with another opponent must be enforced. In addition, it must be made clear to athletes that if they suspect they have concussions, they must remove themselves from play immediately and seek medical attention.[6]

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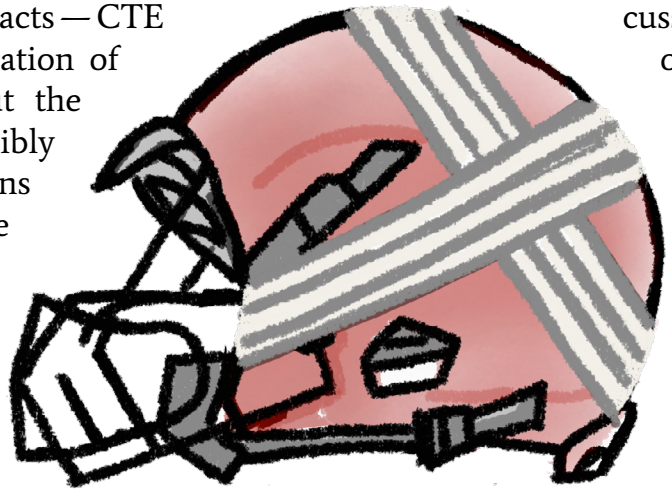
# CTE: IMPACTING THE LIVES OF ATHLETES

By Kiki Kim '20

Chronic Traumatic Encephalopathy, or CTE, is an athlete's horror story, a monster lurking under the bed of everyone that participates in a contact sport. Through repeated trauma to the brain — both concussive and subconcussive impacts — CTE develops as a degeneration of brain cells throughout the brain, manifesting visibly in the dissected brains of former athletes. The trauma to the brain also has severe effects on the lives of those suffering with CTE: patients experience mood changes, aggression, depression, paranoia, dementia, confusion, and impaired judgement.[1]



Some of the most striking narratives of those with CTE have been the most tragic — namely, a series of ex-professional football players who have taken their own lives as a result of the symptoms of CTE. Such players include Junior Seau, Ray Easterling, Terry Long, Andre Waters, and undoubtedly many more.[2] These narratives have been in the spotlight of the media, even resulting in the 2015 movie Concussion, which focused on the development of CTE research by Dr. Bennet Omalu.[3] Through his research, Dr. Omalu began making explicit connections between football and CTE. The nature of football leads to repeated hard impacts on the head and body, and despite the protective helmets and body pads, players still often suffer from injury, concussions, or subconcussive impacts. Subconcussive impacts still shake the brain, but the damage to the brain cells is not as severe as a concussion. Clearly, football players seem

to be at very high risk for brain damage. However, they are far from the only athletes that are regularly faced with concussions, much less subconcussive impacts.

In 2008 to 2010, researchers studied the concussion data of high school athletes for 20 different sports. For each sport, they compared the number of exposures (practices or games) to the number of concussions received. The results confirmed that football was the riskiest sport for concussion, with a concussion rate of 6.4 per 10,000 exposures. However, boys' ice hockey was a close second (5.4), and many other sports, including boys' lacrosse, girls' lacrosse, and girls' soccer were close behind. Perhaps more surprising, it was found that when similar boys' and girls' sports were compared to each other, girls' sports actually had a higher rate of concussions. According to this study, "Although interest in sports-related concussions is usually focused on full-contact sports like football and ice hockey, concussions occur across a wide variety of high school sports. Concussion rates vary by sport, gender, and type of exposure."[4]

Even though football and hockey are assumed to be prime candidates as cause for brain injury, many sports can make athletes prone to getting concussions. It would be ridiculous to ask that participation in sports end entirely: participation in sports correlates strongly with life satisfaction in adults, and the spectation and participation of sports is closely entwined with American — and worldwide — culture.[5] That being said, there is opportunity to make every sport safer. The Centers for Disease Control (CDC) recommends a few important steps towards reducing concussions, including the creation of a safe culture around injury and concussion, the development of a concussion response system, and the enforcement of game rules. The CDC program Heads Up has a website focused on concussion and CTE safety that covers everything from the use of helmets to concussion recovery strategies. The Heads Up initiative is responsible for providing information about concussions to coaches, parents, and athletes involved in youth sports, including how to prevent, recognize, and respond to a concussion.[6]

CTE is a looming danger over every football player's head. However, it also threatens athletes of all sports. A concussion or an impact to the head should not be shrugged off in favor of playing the next set, quarter, or game. There is definitely no need to ban sports altogether, but measures should be taken in order to prioritize the safety of the players over the victory of a game.

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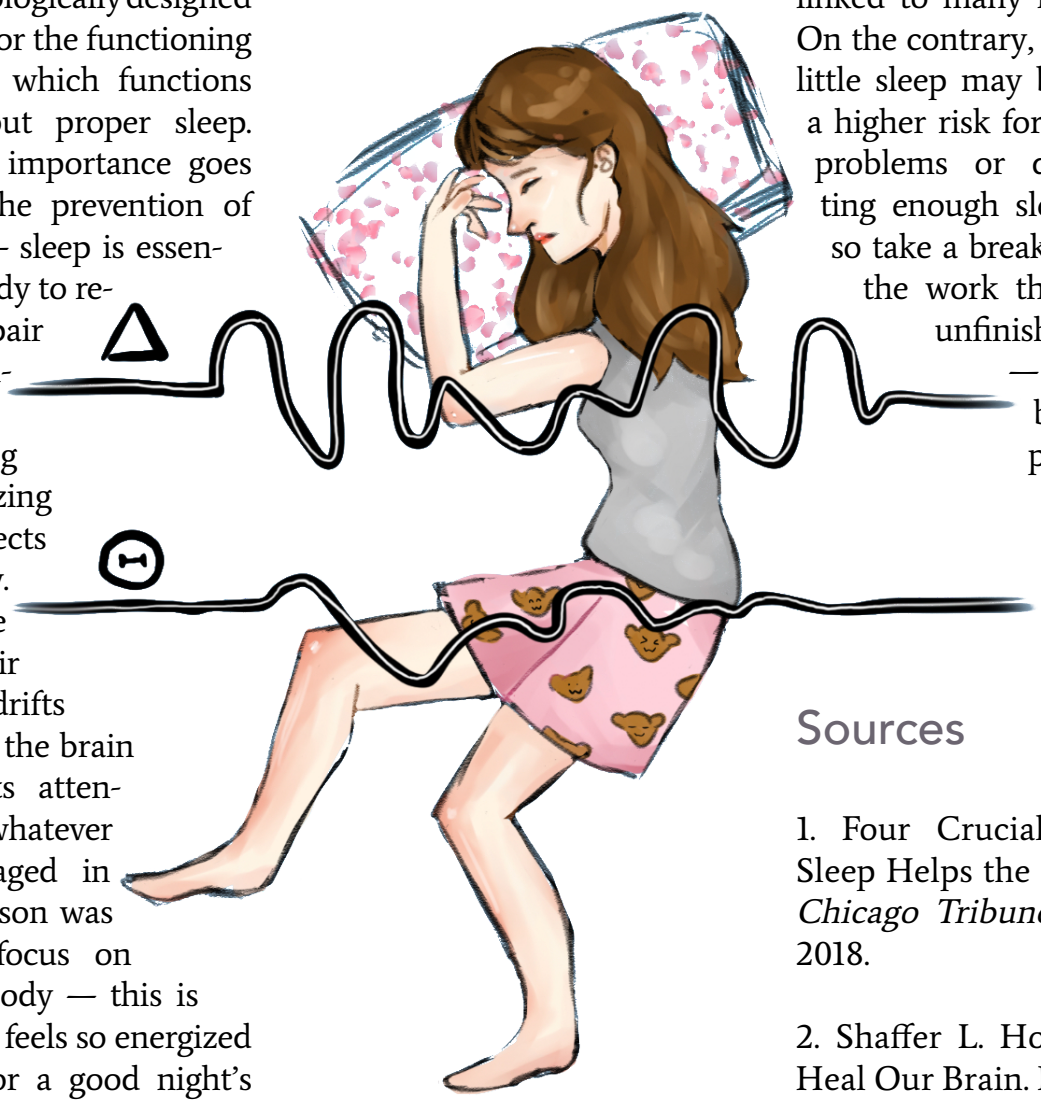
# HEALING: HIT THE PILLOW

By Jacqueline Zou '20

Sleep is biologically designed to be crucial for the functioning of the body, which functions poorly without proper sleep. However, its importance goes far beyond the prevention of dark circles — sleep is essential for the body to restore and repair different bodily functions.

Sleeping has amazing healing effects on the body. When one closes their eyes and drifts into a dream, the brain can divert its attention from whatever it were engaged in when the person was awake and focus on healing the body — this is why the body feels so energized after a nap or a good night's sleep. Studies have shown that increased amounts of sleep encourages the body's self-recovery process. When sleeping, the brain releases hormones that encourage tissue growth, which is especially helpful if one accidentally pulled a thigh muscle or got a papercut.[1]



Sleeping also fights illnesses faster. When one falls ill with a cold or a fever, he/she is more likely to get well quicker with a good night's sleep.[2] Sleep lowers blood pressure, which gives the heart a break from the stress it faced during the day.[3] This may prevent inflammation, which is linked to many heart diseases. On the contrary, those who get little sleep may be exposed to a higher risk for various heart problems or diabetes. Getting enough sleep is crucial, so take a break and set aside the work that you've left unfinished until 2AM — health should be your first priority.

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