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CHOATE PUBLIC HEALTH

be healthy.

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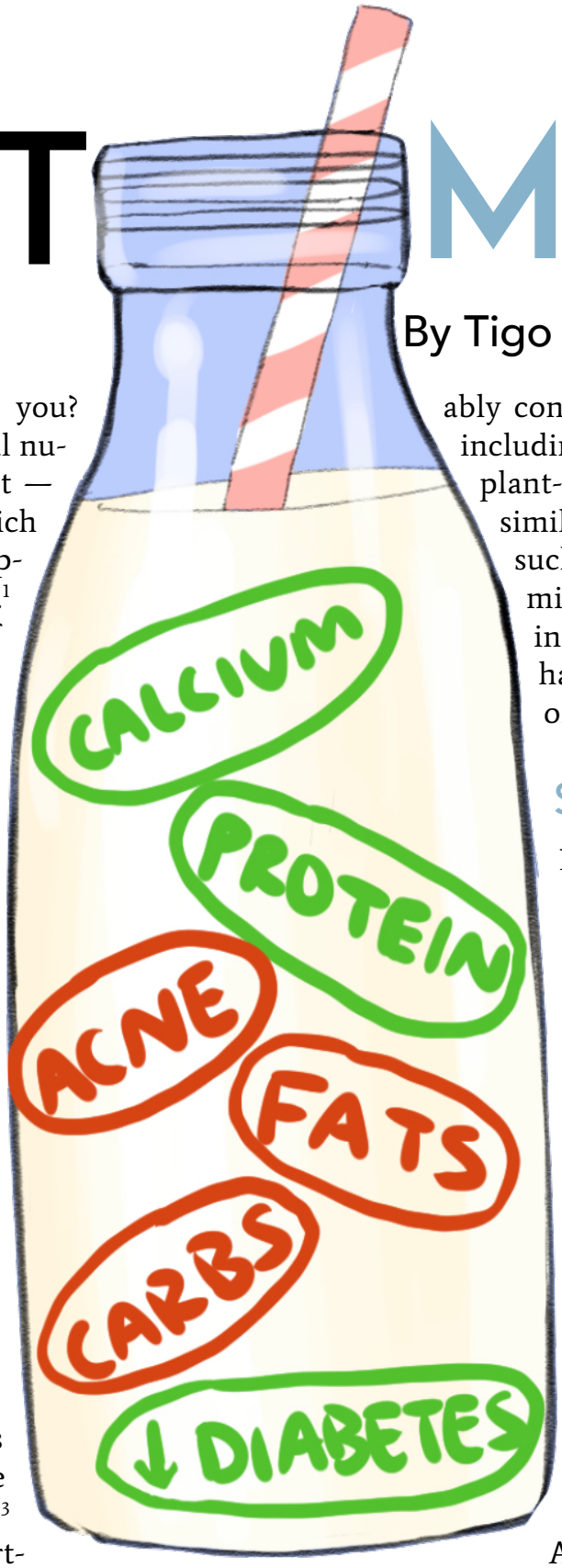
GOT MILK?

By Tigo Ponce de Leon '22

How good is milk for you? Cow milk boasts 18 essential nutrients needed in every diet — most notably calcium — which are vital for healthy development in teens and children.[1] Milk also provides a lot of protein, which is used to fuel the body and assist in muscle recovery. The protein found in milk has been found to improve blood sugar balance, which lowers the risk of type 2 diabetes.

Milk is not perfect, though. One study found a connection between teenagers with acne and the consumption of low-fat milks. This link may be due to the carbohydrates and whey protein found in low-fat milk.[2] In addition to potentially causing acne, most humans are unable to completely digest cow's milk: 75% of the world's population suffer from some sort of lactose intolerance.[3] Those who cannot comfortably consume milk might think of including one of the countless plant-based options that offer similar nutritional benefits, such as soy, rice, or almond milk. The next time you are in the dining hall, consider having a glass of milk or one of its alternatives.



Graphic by Nico Decker '20

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SUICIDE:
THE EPIDEMIC PUT ON THE BACKBURNER

By Laryssa Gazda '20

We are amidst a crippling epidemic. As the tenth leading cause of death in the United States, claiming nearly 45,000 Americans a year, suicide is a major health crisis both in the United States and around the world.1 For every suicide in the U.S., there are 25 attempts at suicide, and for every reported suicide death as of 2015, about 11 people visit a hospital for self-harm related injuries.[1] Knowing these jarring statistics, it seems logical that the U.S. healthcare system would be doing everything it possibly can to decrease suicide rates. This, however, is not the case. In fact, public funding for research to counter the crisis is significantly lacking; funding for suicide prevention is about a quarter of that spent on finding a cure for Inflammatory Bowel Disease.[2] What's more, rather than steadily decreasing, suicide rates are increasing every year. The Centers for Disease Control and Prevention (CDC) reports that suicide rates in the U.S. have increased 30% since 1999.[3] We must start seeing the suicide epidemic for what it is: a pressing public health crisis with an attainable solution.

Why has there been so little progress?

The stigma behind mental health plays a key role in the slow progress of mental health services. Dr. John V. Campo, Chair of the Department of Psychiatry and Behavioral Health at Ohio State University's Wexner Medical Center, notes that physicians continue to view healthcare and mental health as disparate fields, creating an environment where mental health is cast aside and undervalued.[2] In addition, primary physicians are not doing enough to identify possible risk factors and warning signs in their patients. Research from CDC has found that more than half of individuals who died from suicide did not have a diagnosed mental health condition.[3] This research is proof of the lack of screening for lesser-known mental illness warning signs in primary care offices. If doctors are able to identify warning signs and stressors early on, such as relationship problems, loss of a loved one, substance misuse, physical health problems, and job, money, or legal stress, they are more likely to suppress suicidal thoughts in their infancies and provide integrated care for their patients.

How can we stimulate progress moving forward?

In order to stimulate progress in mental healthcare and decrease the suicide rate, we first need to recognize that suicide is a public health disaster of the highest degree. Only then can we begin to provide better training for medical professionals and treat patients case-by-case. Dr. Campo stresses that we must stop treating suicide as an incomprehensible affliction and start targeting patients' specific risk factors.[2] Training primary physicians in mental health and wellness will also help the crisis, as it would break the barrier between mental and physical health. By integrating mental health professionals into hospitals and doctors' offices around the U.S., quality of care will improve, likely followed by a decrease in suicide rates.

As we continue to hear from the media that more and more high-profile celebrities and public figures are dying by suicide, there is no avoiding the fact that suicide is becoming a bigger problem as years go by. Whether it be a loved one, friend, classmate, or distant relative, suicide touches all of our lives. If the healthcare community delays changes to the current system, suicide rates will continue to climb, adding to a crisis that affects each and every one of us in different, devastating ways. New policies and a commitment to better mental healthcare are our only hopes for a brighter future.

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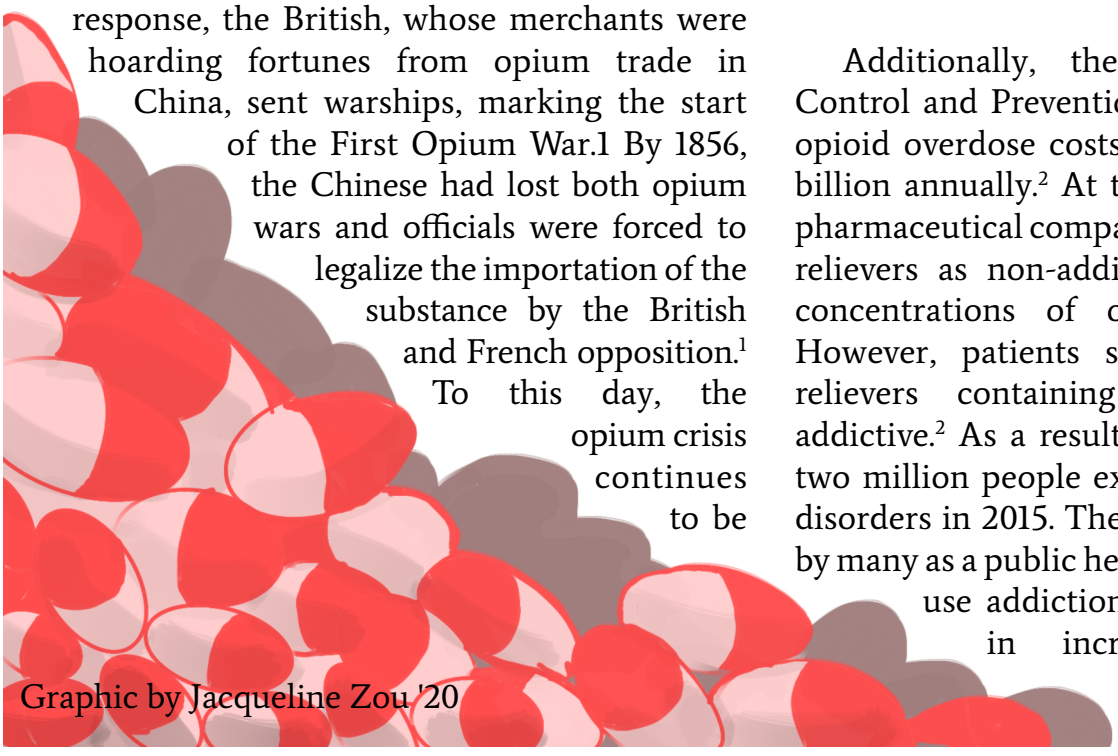
If you are concerned for a friend, yourself, or a loved one, some resources include:

1. Reaching out to the counseling department
2. Making a referral to a member of the assessment team
3. Safe Haven
4. The National Suicide Prevention Hotline at 1-800-273-8255.

THE PAST, PRESENT, AND FUTURE OF THE OPIOID CRISIS

By Faris Alharthy '20

Opiates, derived naturally from poppy plants, are a subset of narcotic drugs that impact the central nervous system. Opium addiction was revealed early on in history as a negative side effect of opium use. In 1729, for example, emperor Yung Cheng prohibited all use and domestic sale of opium in China.[1] Addiction to the substance rose amongst civilians, resulting in the illicit import of opium in exchange for silver. In 1839, Chinese officials ordered the complete surrender of all opium; however, in response, the British, whose merchants were hoarding fortunes from opium trade in China, sent warships, marking the start of the First Opium War.1 By 1856, the Chinese had lost both opium wars and officials were forced to legalize the importation of the substance by the British and French opposition.[1] To this day, the opium crisis continues to be a battle against addiction for the health of many people.



Graphic by Jacqueline Zou '20

According to the National Institute on Drug Abuse (NIDA), more than 115 people in the United States die each day due to opioid overdose.[2]

Additionally, the Centers for Disease Control and Prevention (CDC) estimates that opioid overdose costs the United States $78.5 billion annually.[2] At the turn of 20th century, pharmaceutical companies declared opioid pain relievers as non-addictive, leading to higher concentrations of opium in medications.[2] However, patients soon realized that pain relievers containing opium were highly addictive.[2] As a result of opioid consumption, two million people experienced substance use disorders in 2015. The current situation is seen by many as a public health crisis, with substance use addiction and disorders resulting in increased opioid misuse

during pregnancy and the spread of infectious diseases such as hepatitis C and HIV.[2] The NIDA estimates that up to 29% of patients with opioid prescriptions transition into misuse and develop a substance use disorder.[2] As the current opioid crisis in the U.S. impacts countless patients across the nation, health experts are scrambling for a solution.

With increasing pressures on the U.S. Department of Health and Human Services to put an end to the opioid crisis, the government has made several efforts to mitigate the consequences. Government officials are proposing state prescription drug monitoring programs to limit opioid use disorder, while still providing access for patients requiring medical opioid prescriptions.[3] Additionally, other government initiatives are working to provide mandatory education on the dangers of opioids while also expanding funds for medical treatment.[3] Some government officials recommend that president Donald Trump declare a national emergency for the opioid crisis, which could work through the enactment of the National Emergencies Act and the Public Health Service Act.[3]

The most popular recommendation, however, is the construction of safe injection sites to monitor drug usage by patients with the aid of medical experts.[4]

Health experts have also attempted to aid the government in finding solutions. For instance, numerous health experts highlight the importance of treatment for addicted patients. Treatments can include counseling or even the use of alternative medications like buprenorphine and methadone, which aid the patient in reducing the common withdrawal symptoms when getting off of opioid use.[3] Others stress the importance of an overdose antidote in the form of naloxone, which can treat a narcotic overdose in an emergency.[3]

Even with the U.S. government and health experts working to put an end to this age-old public health crisis, the opioid crisis is impacting millions of patients around the world. Leaders should begin by following recommendations made by healthcare providers and take a step in ridding the the world of opium addiction.

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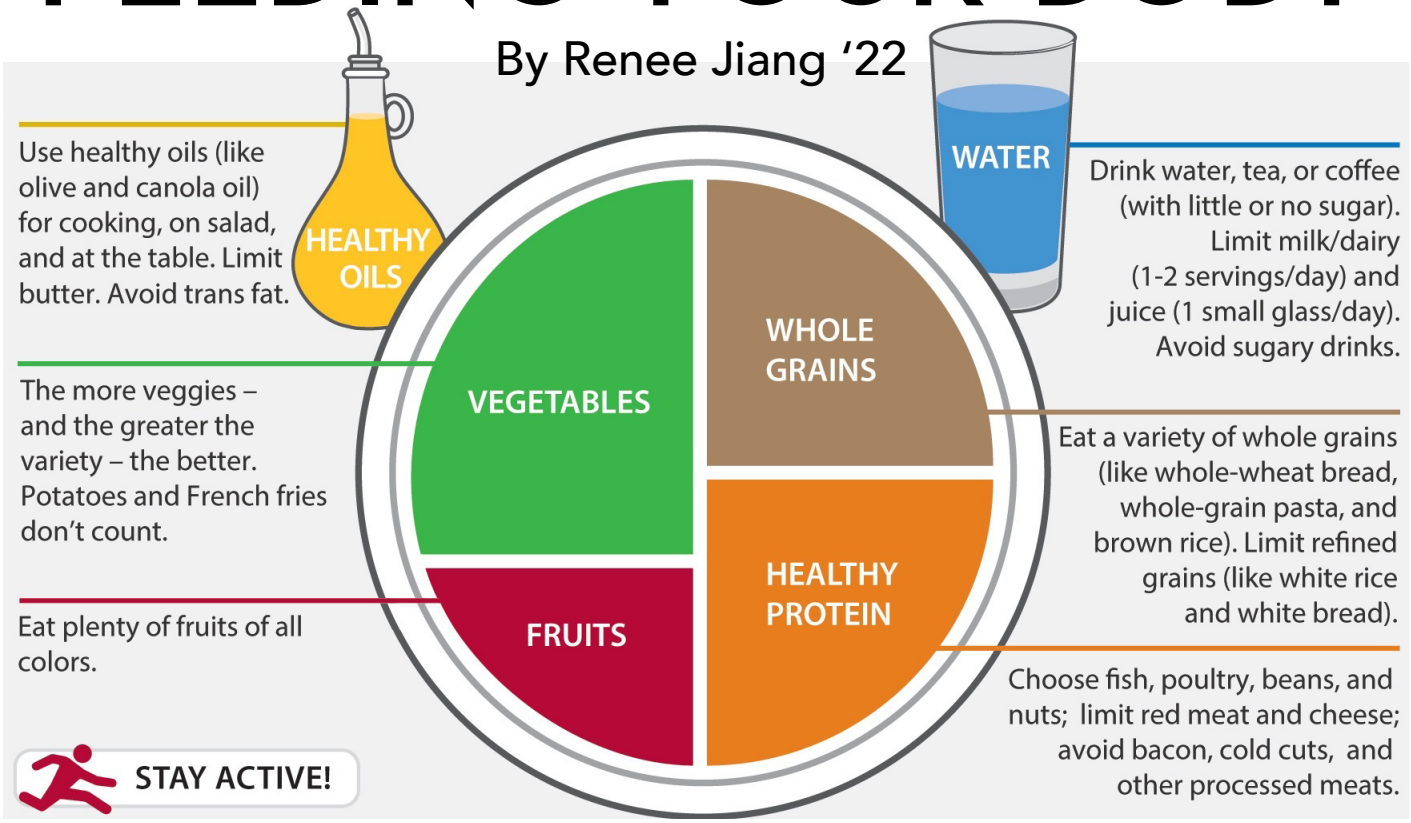
FEEDING YOUR BODY

By Renee Jiang '22



Since the implementation of 20-minute lunch blocks, students have been struggling to feed themselves adequately. Time constraints often push people to food stations with the shortest lines (i.e. pizza, pasta, soup, or cereal), which can be at the sacrifice of nutrition and health. With these concerns in mind, what should a healthy and balanced meal at Choate look like?

1. ¼ Protein

Protein is needed to produce hormones and enzymes. For a healthy diet, consume lean protein, such as chicken or turkey. Tofu and beans are also good options for vegetarians.[1]

2. ¼ Carbohydrates

Carbohydrates are the primary source of fuel for the brain and body. Brown rice, whole wheat pasta, whole wheat bread, sweet potatoes, corn, peas, and squash are some examples of carbohydrates offered in our dining hall.[1]

3. ½ Fruits and Vegetables

Fruits and vegetables are your body's main sources of vitamins, minerals, and fibers.[2] Incorporation of these foods into your diet is essential to maintaining your health.

4. Limited amounts of fat and dairy

Fat provides insulation, and dairy provides a good source of protein and calcium for your body. Avocados and yogurt are good sources of fat and dairy, respectively.[3] However, an excess of either food group can be harmful.

Learning to navigate your personal taste as well as your body's needs is difficult and requires a lifelong journey that takes both patience and willingness for experimentation. Make some time to eat this winter term, even when a busy schedule tries to make that impossible.

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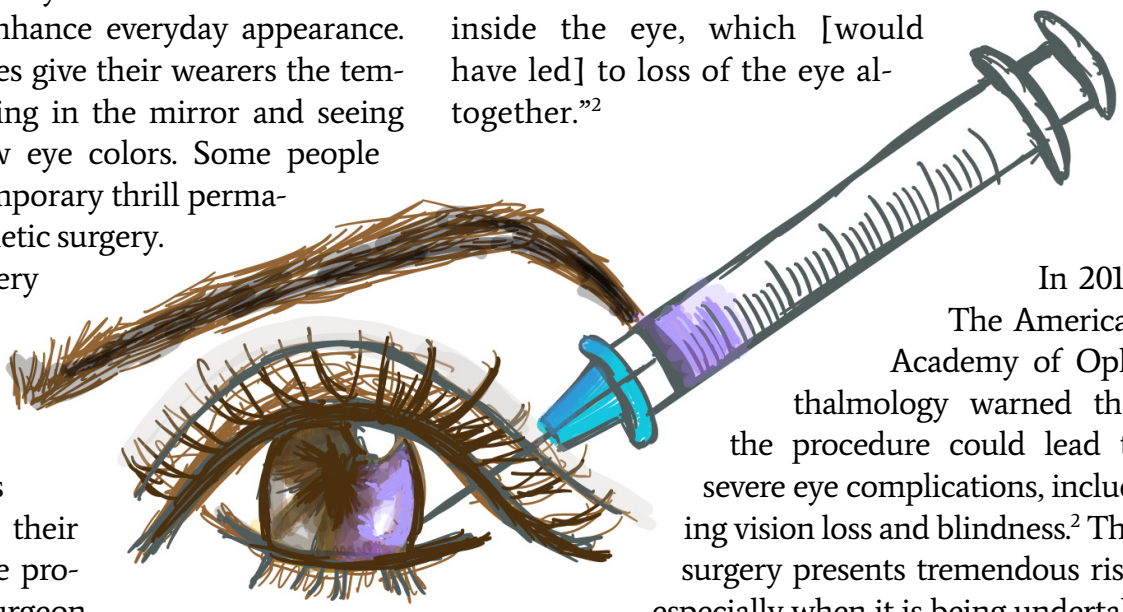
COSMETIC IRIS IMPLANT SURGERY: PERMANENTLY CHANGING EYE COLOR

By Laura Jiang'21

Colored contact lenses are no longer just for Halloween; instead, they have become a fashion statement used to enhance everyday appearance. Colored contact lenses give their wearers the temporary thrill of looking in the mirror and seeing themselves with new eye colors. Some people seek to make that temporary thrill permanent — through cosmetic surgery.



Iris implant surgery was developed initially as a medical procedure, but it has been co-opted by the fashion-lovers as a way to change their eye color. An average procedure involves a surgeon inserting a silicon-based artificial iris through a small cut made on the cornea. The artificial iris, then, covers the natural iris.[1] The eye, however, is an extremely delicate, sensitive organ, and thus, this procedure carries significant medical risk. Furthermore, this procedure has not been approved by United States Food and Drug Administration.[2]

After opting to undergo this surgery, Nadinne Bruna, an Instagram model, was left partially blind. Dr. Colin MacCannel, a professor of clinical ophthalmology at the University of California, Los Angeles, added, "Worst-case scenario, she could have suffered an infection inside the eye, which [would have led] to loss of the eye altogether."[2]

In 2014, The American Academy of Ophthalmology warned that the procedure could lead to severe eye complications, including vision loss and blindness.[2] This surgery presents tremendous risk, especially when it is being undertaken for merely cosmetic purposes. For the foreseeable future, the safest way to change your eye color remains temporary: colored contact lenses.

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Graphic by Deanna Tan '20

THE SCOPE OF DIABETES: UNDERSTANDING ITS DIVISIONS

By Lizzie Quinn '20

Diabetes is an array of disorders involving complications with the hormone insulin.[1] The pancreas — an organ located behind the stomach — normally releases insulin to help one's body store and use the sugars and fats from food as energy.[1] However, for diabetes patients, the pancreas produces very little to no insulin, or the body does not respond as it should to insulin. Some patients also have the impaired ability to process blood glucose (blood sugar). [2] Since there is no known cure to diabetes, patients must manage their health by regularly monitoring food intake and blood glucose.[1]

Types of Diabetes

An estimated 30.3 million Americans live with diabetes, both diagnosed and undiagnosed. These patients suffer from different types of diabetes. The three main types of this metabolic disorder are type 1, type 2, and gestational. There is also a pre-diabetes stage referred to as impaired glucose tolerance, where blood sugar levels are slightly higher than the normal average range, but are considered too low to be classified in the diabetes range.[3]

Type 1 diabetes (T1D) is an autoimmune disease that affects around 1.25 million Americans, with an anticipated 5 million total by 2050.[3] It is also referred to as juvenile diabetes because T1D patients are typically under the age of 20. T1D patients have pancreases that produce very little to no insulin because the insulin-producing pancreas cells either exist in small amounts or are entirely destroyed. While researchers are unsure of what causes T1D, there are some associated factors such as genetics, viral infections, or environmental impacts.[4] Those who develop T1D suffer from the disease for the entirety of their lives and will need treatment through insulin shots or insulin pumps. Insulin shots and pumps assist the body through the injection of the insulin hormone into the bloodstream, allowing the body to store glucose in the liver to balance sugar levels and use it for energy.[3] Insulin injections keep those with T1D alive and their blood glucose levels within a healthy recommended range, but insulin therapy is not a cure.[3]

Type 2 diabetes (T2D) is also known as adult-onset or noninsulin-dependent diabetes. It is usually preceded by pre-diabetes and is most prevalent in adults, but is becoming more common among children as the prevalence of childhood obesity in America increases.[5] 29.1 million Americans have T2D.6 This increasingly common but largely preventable disease is caused by older age, excess weight, family history, or poor diet.[5] T2D is considered a lifestyle disease because it is normally triggered by living a sedentary life unlike its auto-

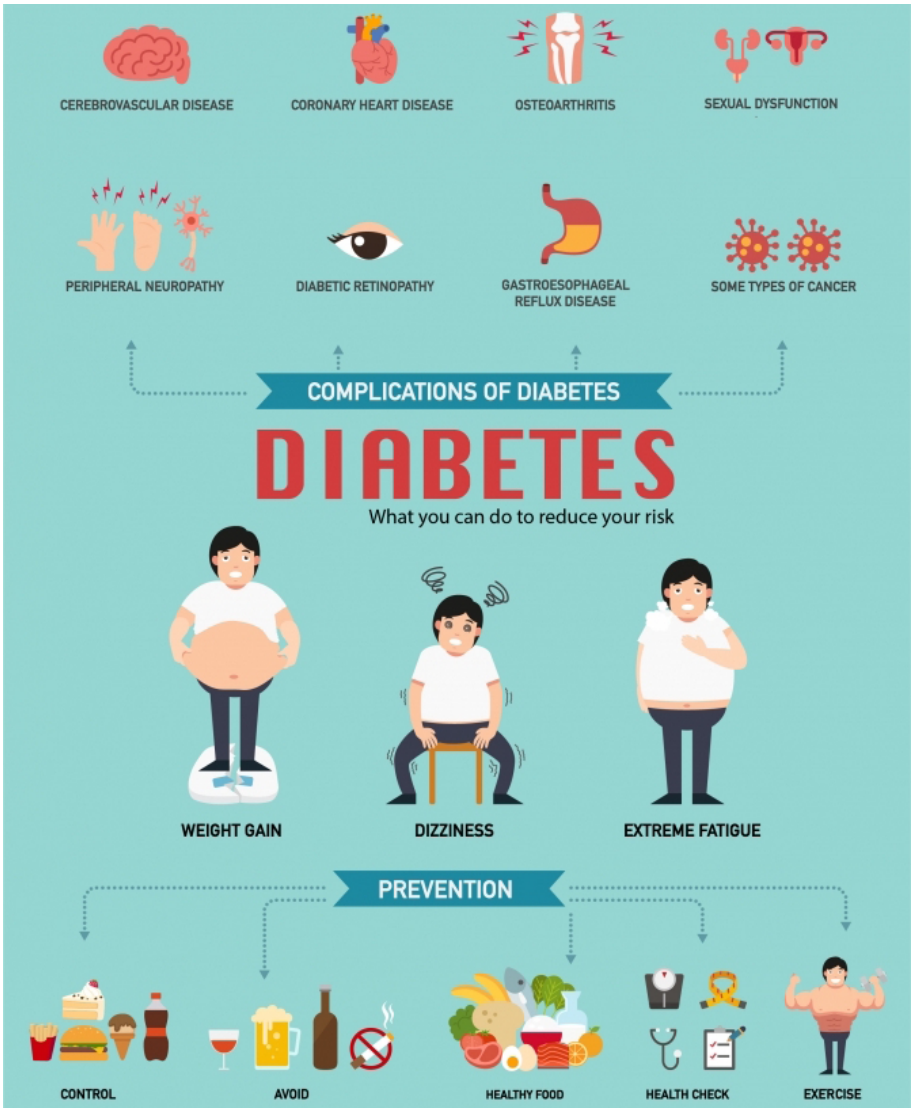
immune counterpart, T1D.[5]

Gestational diabetes is a condition of high blood sugar affecting women during pregnancy.[7] Unlike the preceding forms of diabetes, however, the cause of gestational diabetes is likely the increase of hormones in the body during pregnancy. These increased hormones may make one's body resistant to insulin.[7]

Options for Glucose Monitoring

Typically, insulin treatment for types 1, 2, and gestational diabetes is administered via injection and used in conjunction with consistent glucose monitoring. In recent years, inhaled insulin has been recognized for its advantages in being a more comfortable replacement for subcutaneous injections.[8] Inhaled insulin, ultra rapid insulin, and "smart" insulin — other emerging technologies that improve blood glucose control — correct hyperglycemia (excess glucose in the bloodstream) better than mainstream constant glucose monitors or self-administered injections.[8]

T1D cannot currently be cured, but those with the disorder must monitor their food intake, blood glucose, and insulin levels to effectively manage the life-long disease. On the other hand, type 2 and gestational diabetes can be reversed with proper weight management techniques, preventing fatty tissue resistance to insulin.[5]



OnTrack Diabetes

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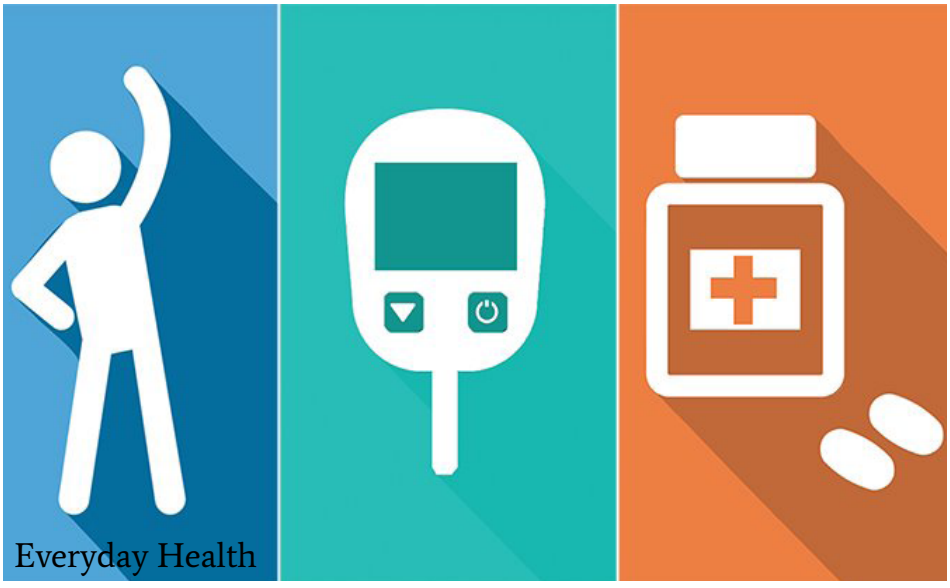
A LESS POINTY INSULIN DELIVERY SYSTEM

By Claire Yuan '21

Vaccination season is here, leaving many needle-fearing people in a tizzy. Most of these people only need to face these sharp steel points once or twice a year, but for the 422 million people in the world struggling with diabetes, needles of varying sizes are pervasive in their everyday lives.[1] The variety of needles used for glucose level tests and insulin injections can cause significant fear, stress, and, of course, pain for patients. In order to make diabetes care more comfortable, several companies around the world have developed needle-free devices to aid the process.

Because diabetes is a medical condition centered around insulin, the most common uses of needles in diabetes care are in monitoring blood sugar levels and injecting insulin. For some patients, the former is required up to seven or more times a day.[4] As a result, the market for needle-free diabetes care has expanded.



Everyday Health

In order to get blood sugar or glucose level tested, a patient with diabetes needs to get a finger pricked by a needle. A blood glucose meter will then be able to test that drop of blood.[3] Not only fear of needles, but also other factors such as the price of blood test strips and the inconvenience of self-monitoring have presented barriers to consistent glucose level tracking. In order to achieve better and more comfortable blood sugar monitoring techniques, researchers have developed a noninvasive

Techsob

glucose monitoring device.

Developed by a group of researchers at the University of Bath in the United Kingdom, a new adhesive skin patch boasts the ability to test blood sugar levels every 10-15 minutes without picking the patient's skin. The patch is made up of miniature sensors that use electric currents to "draw out" glucose from fluid secreted from the cells on hair follicles.[5] The patch will then send readings to the user's smartphone, notifying them when medication is necessary. Testing on both pigs and humans has confirmed the effectiveness of the patch for up to six hours. Researchers are looking to extend the patch's abilities to 24 hours.[3]

Beyond blood glucose monitoring, many diabetic patients (especially those with type 1 diabetes) also need to deal with needles when insulin is injected into their systems. Portal Instruments, an MIT startup company, has developed a jet-injection device that can alleviate the stress and anxiety associated with needles. The device uses a "rapid, high-pressure stream of medicine, as thin as a strand of hair" to pass medicine through the skin into the human body. There is hope that devices like these will be able to make diabetes care less traumatizing for all patients.[6]

Despite this new, cutting-edge technology, however, there is concern that the world is running out of insulin. According to a study published in the peer-reviewed medical journal The Lancet Diabetes & Endocrinology, by 2030, about half of the 79 million adults with type 2 diabetes will not have access to insulin.[7] This means that although we all have our eyes on a faster, more sustainable, and more comfortable future, it is crucial to remain conscious of the complications that may come with that dream.

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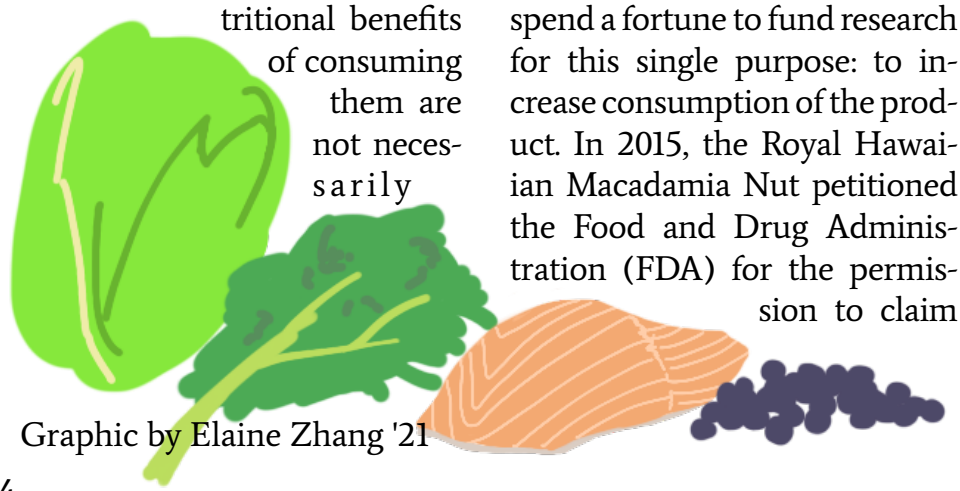
SUPERF

EMPOWERING

By Jayden

How important is it to incorporate superfoods into our diets? Foods such as kale, chia seeds, and açaí have recently received an increasing amount of public exposure through their classification as superfoods. Foods that fall under this overarching term are usually rich of nutrients, especially vitamins and minerals that positively impact our health. However, according to the American Heart Association and other venerated health experts, there is no specific criteria for superfoods, nor are superfoods considered an actual food category.[1]

You may have seen this in articles titled "Top 12 Foods of the Year," or "superfood" labels plastered onto kale packaging. While these foods are healthy if eaten in moderation, the nutritional benefits of consuming them are not necessarily exclusive to that food. Other foods that do not fall under the "superfood" category can still provide you with similar health benefits.



Graphic by Elaine Zhang '21

"Superfood" is simply a marketing term coined and exploited by food corporations to increase revenue.

As economically conscious consumers, we make the decision to purchase something when we believe the benefit outweighs the cost. Naturally, we would have more incentive to purchase a product when "reduces risk of coronary heart disease" is advertised on the product. Corporations are willing to spend a fortune to fund research for this single purpose: to increase consumption of the product. In 2015, the Royal Hawaiian Macadamia Nut petitioned the Food and Drug Administration (FDA) for the permission to claim that macadamia nuts could reduce the risk of heart disease.[2] The experiment confirmed that macadamia nuts may only reduce the risk of coronary heart disease when consumed as a part of a diet low in saturated fat and cholesterol, which reduces the risk of heart disease alone by adopting it.[2] This case perfectly demonstrates how showcasing a product's health benefits is used primarily for the purpose of increasing sales.

Popular Superfoods:

Kale

Kale, being the most famous of all superfoods, deserves attention for its numerous health benefits. Kale contains folate, zinc, calcium, iron, magnesium, vitamins A, C, K and fiber. Kale is considered to be a component in the dark green leafy greens (DGLG) family, along with other similarly nutritious foods: swiss chard, collards, spinach, lettuce, arugula and turnip greens.[3] The nutrients in the DGLG family contribute to a series of physiological functions to maintain our health.

OODS:

OR DECEIVING?

Khuu '21

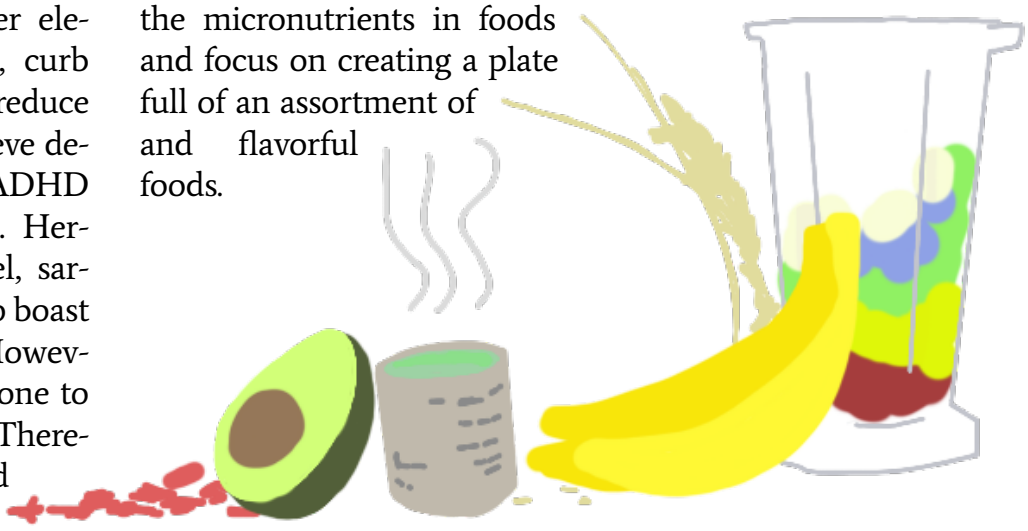
Açai Berry

This superfood is commonly found in the form of juice in supermarkets. Researchers have found açai berry to contain antioxidants that may protect cells from damage caused by harmful molecules in the body called "free radicals," and alleviate diseases such as heart disease and cancer. [4] Many berries, including blueberries, blackberries, strawberries, raspberries and cranberries, also test positive for containing antioxidants.[3] These berries contain vitamins and minerals that allow for certain metabolic functions to be carried out more easily.

Salmon

Salmon is rich is omega 3, a fatty acid that can lower elevated triglyceride levels, curb stiffness and joint pain, reduce the effect of asthma, relieve depression, and help treat ADHD and Alzheimer's disease. Herring, swordfish, mackerel, sardines, tuna, and trout also boast high levels of omega 3. However, these fatty fish are prone to mercury contamination. Therefore, it is recommended to eat fish that are lower on the food chain because larger fish have higher levels of mercury than smaller fish.[1]

A healthy and balanced diet should consider the macronutrients (carbs, protein, fat, dietary fiber, and fluids), as well as the micronutrients (vitamins and minerals). The exclusive consumption of superfoods would not provide ours bodies with the 230 micronutrients we need. Moreover, the vitamins and minerals present in a superfood are also present in a wide array of other foods. While you should explore these nutritious superfoods by including them in your diet, you should not become blinded by the superfood label. Instead, be conscious of the micronutrients in foods and focus on creating a plate full of an assortment of and flavorful foods.



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ACROSS THE POND:
A COMPARISON OF HEALTHCARE SYSTEMS IN THE US AND UK

By Noah Trudeau '20

From a historical perspective, it is understandable why so many American institutions are modeled off their United Kingdom counterparts. However, one component within the American government has gone in a wildly different direction — healthcare, both in terms of cost and efficiency, has divided America and Britain into individual extremes. While Britain has one of the largest public sector systems, America has grown into the largest private network.[1] In other words, the UK government provides healthcare to all citizens through the country's taxation process. In 2008, English citizens paid approximately 9% of their gross income towards healthcare taxes.[2] While this increases contribution costs, socialized medicine makes care accessible to more people. Whereas some American citizens unnecessarily use emergency rooms due to an inability to pay for treatment, English taxpayers can walk into any care center without hesitation and leave emergency services available for more urgent matters. Additionally, the UK has less variation in their healthcare outcomes along with a higher-ranked "cost fairness" in comparison to the US.[1]

Unfortunately, the freedom that universal healthcare provides is hindered by a lack of general practitioners and decreased responsiveness in hospitals. The National Health Service (NHS) of the United Kingdom estimates that in heavily populated areas, twice as many healthcare practitioners are needed. This shortage has resulted in longer wait times ranging from one week to two months.[2] Routine diagnostic tests have also been affected by an insufficient number of healthcare providers. According to a recent NHS monthly report, the average British citizen has to wait around two weeks for a relatively simple test like an MRI or CT scan.[3] Socialized medicine in the UK may guarantee one's access to care, but in no way ensures that one receives the care.

Across the pond, American healthcare policies follow a completely different set of guidelines and regulations. In contrast to the British ideology that healthcare is a basic human right, healthcare is widely regarded as a privilege in the United States. With the exception of Medicare and Medicaid, private companies provide healthcare of different deductibles, co-payments, and monthly premiums. Today, it is typical of employers to pay for their employees' healthcare as a fringe benefit in job packages.[4] This leaves the average American citizen paying only 5% of their gross income towards uninsured medical costs – 4% lower than the United Kingdom's average. Additionally, the American healthcare system has unparalleled responsiveness, with an emergency wait room time of merely 58 minutes as opposed

to Britain's three hours.[2]

However, these benefits do not pertain to the 16% of the American population that remain uninsured by a private health insurance or government program.[1] This relatively small percent accounts for over 50 million Americans dependent on their own financial resources and/or charitable donations to receive necessary health care. Even for those with coverage, pre-existing conditions and uncovered treatments can quickly rack up costs. An American Journal of Medicine article recently found that medical debt is the biggest cause of bankruptcy.[4] Additionally, while emergency services in the US may be highly efficient and responsive, recent studies show that other forms of non-emergent care are not held to the same standards. Primary care physicians' appointments vary in wait times, ranging from five to 66 days.[2] In the same vein, the number of biomedical machines and healthcare professionals in a given region can greatly impact waiting periods.

No matter the country, the policies, or the cost, healthcare has one purpose: to better lives. Healthcare should unify, not divide. In the face of illness, inefficiency, and inequality, healthcare must remain a supportive shoulder to lean on.

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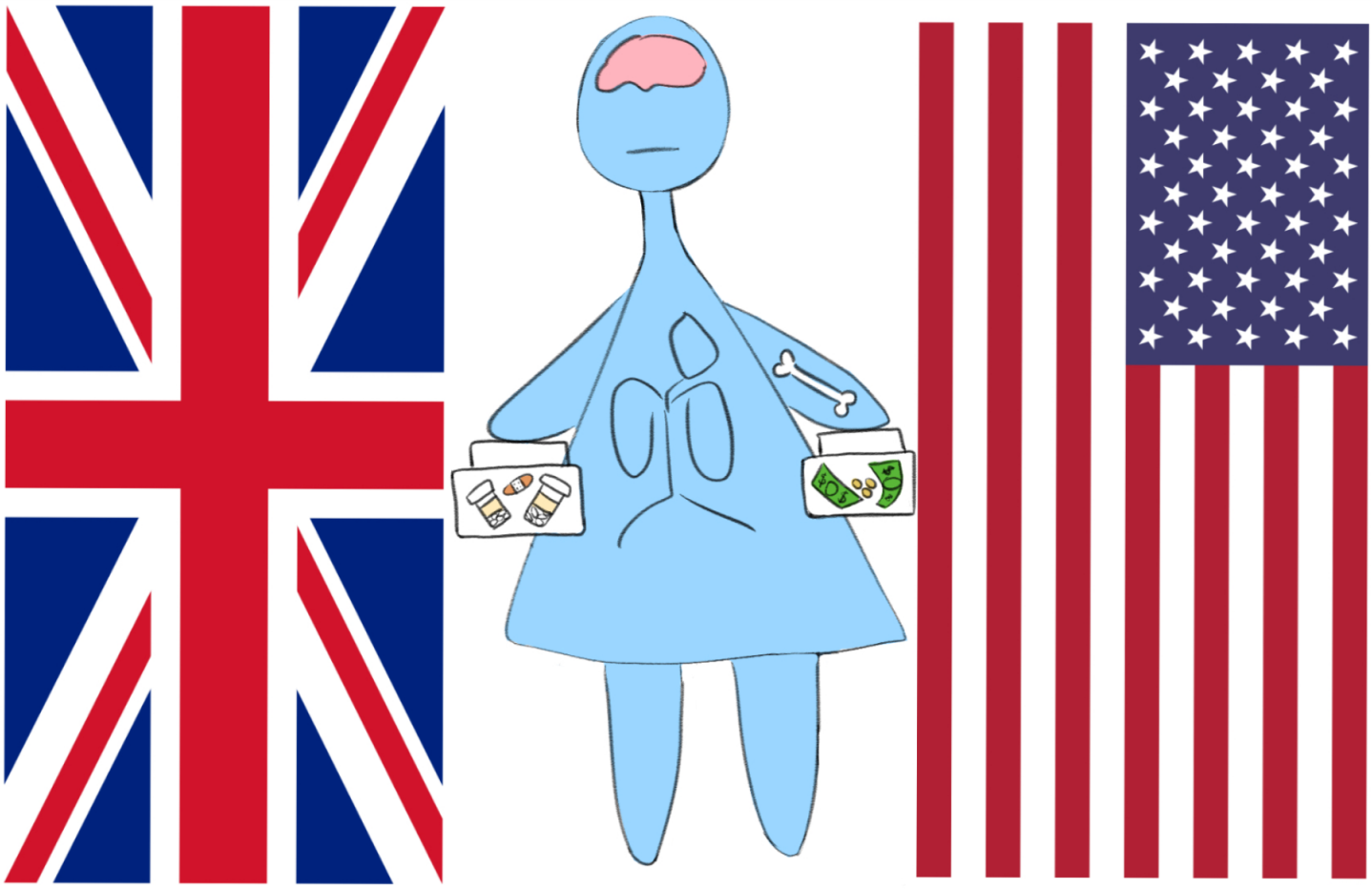

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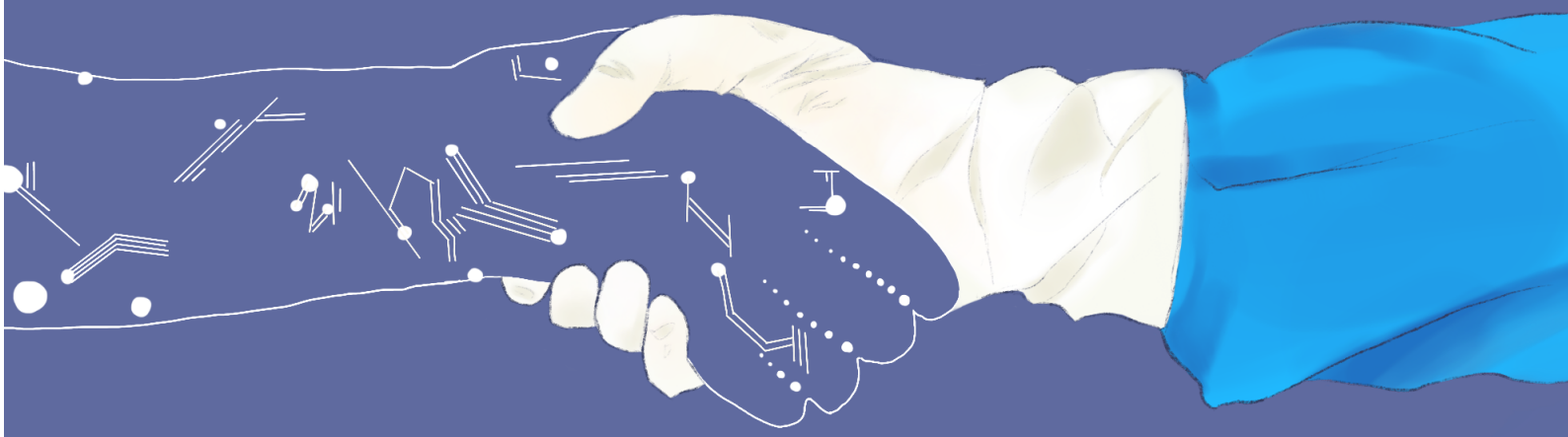
A.I. vs M.D.



WHO'S THE BETTER DOCTOR?

By Blake Bertero '22

Artificial intelligence (AI) has the potential to improve our healthcare system. Doctors spend a substantial amount time on clinical and administrative responsibilities instead of with patients. By integrating AI into hospitals and doctors' offices, physicians could save vast amounts of time. If, for example, AI was put in charge of data collection while also streamlining paperwork management by reviewing dialogue and documents, doctors would be free to remove those tasks from their own to-do list.[1]

In addition to administrative tasks, adding AI to the exam room will speed up diagnoses and the creation of treatment plans. The health data research company IBM created a medical AI named Watson which produced actionable advice for a patient in just ten minutes, whereas it took 160 hours for human experts to identify the same course of treatment.[2] An AI's unfettered access to information online allows for it to analyze and filter symptoms and conditions at speeds impossible for humans. In another example, AI was trained to test the presence of tuberculosis in 150 x-rays and the accuracy rate was 96% — higher than that of most human radiologists.[3]

AI will increase hospitals' access to high quality medical advice for when doctors are absent or unavailable.

AI will increase hospitals' access to high quality medical advice for when doctors are absent or unavailable. While exploration into the realm of artificial intelligence comes with many challenges, the benefit of using such technology will soon outweigh the costs — further intertwining medicine and technology.[3]

Sources

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