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Dear readers of the Choate Public Health Magazine,

   It’s sad to say that the time has come for the final issue of the 2021-22 board. Continuing to be influenced by an ongoing pandemic, this year has presented our community with numerous difficulties and challenges. As gloomy skies and bitter winds pervade our winter term, student morale took a dive this past term. Because stress levels have been higher than ever as the school year progresses, we greatly appreciate all our writers and editors for contributing to this publication despite the tough times. Our releases would not have been made possible without them. With the misty rains and blooming surroundings of spring, we hope that new beginnings will be made and exciting journeys will take place. One such new beginning lies within the next board of the Choate Public Health, who will continue to lead the publication towards intriguing releases each term.

   These past few years working with Choate Public Health, we’ve learned so many unique and interesting news and ideas about global health, science, technology, and most importantly, student health on campus. Changes in the health and medical field often happen at a rapid pace, so to be able to bring forth important and relevant pieces of information to our school community has been a task we look forward to every term. Whether it’s roaming the internet for the most recent health news to report on, editing articles about the newest Alzheimer’s vaccine, or compiling creative layout designs, Choate Public Health has been an amazing opportunity for us to challenge ourselves outside of the classroom.

   By providing a platform for students to research, write, and publish about global health topics and issues, Choate Public Health tries to facilitate health awareness in the community. Each release encourages students — contributors and readers alike — to read, learn, and share about the many aspects of health that interest them. Students are not alone in their passions or struggles, and we hope that our Magazine can continue to help connect the diverse community on campus.

   We hope that you’ve all enjoyed our releases within the past year, and that our newest board will continue serving this community.

   Adieu,

   Renee & Linda
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Child Abuse Prevention Month

Child abuse and neglect is widespread with approximately 2 million children receiving help from prevention services in 2020. Child abuse prevention month focuses on strengthening families, protecting children, and providing support services to remedy domestic conditions.¹

Parkinson's Awareness Month

By 2030, the number of cases of Parkinson's disease in the U.S. is estimated to increase to 1.2 million, but no cure currently exists. Parkinson's disease, a neurodegenerative disease, is caused by a combination of genetic and environmental factors. Parkinson's awareness month encourages people to learn more about symptoms of the disease as well as current treatments and therapies.²

STD Awareness Month

From 2013-2017, double the number of syphilis cases was reported, and gonorrhea cases saw a 67% increase. Sexually transmitted diseases are preventable, and many are curable. In order to reduce STD-related stigma, fear, and discrimination, campaigns, such as the CDC's "Talk. Test. Treat.", raise awareness about STDs and how to communicate with healthcare providers for proper testing and treatment.³

Sources

Due to a recent rise in COVID-19 cases, many Americans are considering getting booster vaccine shots. Teens over the age of 12 can get a booster shot with Pfizer, and adults can get a booster shot with any of the COVID-19 vaccines — Pfizer, Moderna, or Johnson & Johnson’s Janssen. The Centers for Disease Control and Prevention (CDC) is recommending everyone over the age of 12 to get their booster shot in caution against the Omicron variant. The boosters can allow for better protection against the virus, especially with the recent findings of a new Omicron subvariant called BA.2 in Europe.

Although COVID-19 vaccines are widely effective, research shows that their efficacy and protection will decline over time, especially in the senior population. A booster shot contains the same formula as the original vaccine, except in Moderna vaccines, which consists only half the original dosage. Immunologist Dr. Garcia Beltran of Massachusetts General Hospital shared, “only 32% of people who received Moderna, even if it was recently, had detectable neutralization ability against omicron. We're inducing really good neutralization against Omicron with a booster. If you boost everyone, the numbers look amazing.” The booster dose works by increasing the quantity and quality of antibodies, thus strengthening the original vaccine and giving people a better chance of protecting themselves and preventing the Omicron variant from spreading.

Everyone over the age of 18 is recommended to get their booster shot as soon as six months after the second dose of Pfizer or Moderna or two months after the single-dose Johnson & Johnson vaccine. The CDC says it is safe to receive a booster shot different from the original vaccine. In fact, the National Institutes of Health concluded that the best booster for a single-shot J&J vaccine would be either Moderna or Pfizer. Public health experts say that the differences between the different vaccines are insignificantly slight, and the best course of action would be to get whichever vaccine is most accessible.

Additionally, Pfizer and Moderna are currently pushing for FDA approval on a second booster shot of the COVID-19 vaccine. However, a decision has yet to be made as more research is needed to show its effectiveness. That said, countries around the world, such as Sweden, Chile, and Israel, have approved for the second booster shot for specific populations.

For those who have only received their initial vaccines, it is important to get any booster shot as soon as possible. Regardless of the brand, booster shots provide us with an added layer of protection and prevention against COVID-19. Therefore, those who are eligible should sign up to get “boosted” to do their part in flattening the curve.

Sources

Health Observances | 7

National Infant Immunization Week: Fighting Vaccine-Preventable Diseases

From 1994 to 2018, routine childhood immunization among children was estimated to have prevented 8 million hospitalizations, 936,000 early deaths, and 419 million illnesses.\(^1\) To combat some vaccine-preventable diseases, such as the measles and the poliovirus, infants and children would need to receive immunization dosages before the age of two and continue on through their teenage and adult years.\(^2\) According to a Centers for Disease Control and Prevention report released in May 2020, many children missed their vaccinations due to staying at home from the pandemic.\(^1\) With National Infant Immunization Week approaching (April 24-31), many resources will become available to help people learn about the protection immunizations can offer and how to plan for the vaccines.

Depending on the vaccine, there may be a series of shots concentrated in early infancy, such as the immunization for Hepatitis B. For some diseases like varicella or meningoccal, additional dosages are suggested when the child hits a certain age. Unlike the specific scheduling of some vaccine-preventable disease immunization, the influenza vaccine is suggested to be received annually.\(^2\)

**Table 1** Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2022

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Birth</th>
<th>1 mos</th>
<th>2 mos</th>
<th>4 mos</th>
<th>6 mos</th>
<th>12 mos</th>
<th>15 mos</th>
<th>18 mos</th>
<th>24-35 mos</th>
<th>4-6 yrs</th>
<th>7-10 yrs</th>
<th>11-14 yrs</th>
<th>15-18 yrs</th>
<th>19-26 yrs</th>
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<tbody>
<tr>
<td>Hepatitis B (HepB)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
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<tr>
<td>Rotavirus (RV) (2-dose series), RV5 (3-dose series)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
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<tr>
<td>Diphtheria, tetanus, acellular pertussis (DTaP)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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<tr>
<td>Hemophiliac influenza type b (Hib)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>See Notes</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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<tr>
<td>Pneumococcal conjugate (PCV13)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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<tr>
<td>Inactivated poliovirus (IPV &lt;18 yrs)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>See Notes</td>
<td>4th dose</td>
<td>5th dose</td>
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<tr>
<td>Influenza (IV)</td>
<td>See Notes</td>
<td>See Notes</td>
<td>See Notes</td>
<td>Annual vaccination 1 or 2 doses</td>
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<tr>
<td>Influenza (IIV)</td>
<td>See Notes</td>
<td>See Notes</td>
<td>See Notes</td>
<td>Annual vaccination 1 or 2 doses</td>
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<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>See Notes</td>
<td>See Notes</td>
<td>1st dose</td>
<td>2nd dose</td>
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<tr>
<td>Varicella (VAR)</td>
<td>See Notes</td>
<td>See Notes</td>
<td>1st dose</td>
<td>2nd dose</td>
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<tr>
<td>Hepatitis A (HepA)</td>
<td>See Notes</td>
<td>See Notes</td>
<td>2-dose series, See Notes</td>
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<tr>
<td>Tetanus, diphtheria, acellular pertussis (Tdap)</td>
<td>See Notes</td>
<td>See Notes</td>
<td>1st dose</td>
<td>2nd dose</td>
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<td>Human papillomavirus (HPV)</td>
<td>See Notes</td>
<td>See Notes</td>
<td>See Notes</td>
<td>1st dose</td>
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<td>Measles-mumps-rubella (MMR)</td>
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<td>See Notes</td>
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<td>Measles-mumps-rubella (MMR)</td>
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<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td>See Notes</td>
<td>See Notes</td>
<td>See Notes</td>
<td>1st dose</td>
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<tr>
<td>Dengue (DENV, 9-14 yrs)</td>
<td>See Notes</td>
<td>See Notes</td>
<td>See Notes</td>
<td>1st dose</td>
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</tbody>
</table>

**Sources**

2. Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2022. Centers for Disease Control and Prevention. Published 17 March 2022.
Whether you visit a manicure salon as a getaway or browse the shelves at the store filled with tiny bottles, nail polish has most likely made regular appearances in your life. Existing in many shades and hues from a matte burgundy to a glittery cerulean, nail polish is a staple in the cosmetics industry. With a quick coat layered onto your nails, you are ready to go. However, you may have not thought much about it. As it turns out though, nail polish is much more than just sparkly liquid pigments in a bottle. The strong smell released as you twist open a new bottle is a tell-tale sign of its dangerous, chemically manufactured ingredients. It is time to start delving into the list of chemicals on the back of the bottle because some of them could actually cause long-lasting harm to your body.

The first chemical to watch out for is dibutyl phthalate (DnBP). It is commonly used as a plasticizer in nail polish to improve the flexibility of the mixture, prevent chipping, and preserve the color. Although no human studies on the toxicity of DnBP have been published, animal studies link this ingredient to nausea and irritation to the eyes, skin, nose, mouth, and throat. Some reports indicate that long-term exposure could ultimately cause reproductive issues, especially in males.

Next is toluene, a colorless liquid often used in glue that acts as a paint thinner to evenly spread the color of the nail polish. It is unknown how toluene specifically produces systemic toxicity, but this chemical has been associated with dizziness, numbness, dry skin, and irritation. Some studies also show that exposure to toluene during pregnancy can cause birth defects in children. Due to their harmful health effects, toluene and DnBP have both been banned by the European Union but remain legal in the United States.

Formaldehyde is next up on the list of dangerous ingredients in nail polish. This substance is frequently used in many products even though it can be very harmful to people's health. In nail polish, it serves as a hardening agent and has been linked to nasal and lung cancers by the International Agency for Research on Cancer. As a result, the U.S. Food and Drug Administration (FDA) put in place a limit on how much formaldehyde can be used in nail polish and nail hardening products at 0.5% and 5% concentration, respectively. However, even with this regulation in place, the acceptable concentrations in products are still relatively high and remain a concern.

Lastly, triphenyl phosphate (TPHP) is a chemical sometimes used to replace DnBP in nail polish. According to a study done by researchers from Duke University and the Environmental Working Group, TPHP is a hormone-disrupting chemical that gets absorbed into the body every time a coat of nail polish is applied.
By Claire Liu '24

What is even more alarming about these harmful nail polish ingredients is that the labels of the products are often misleading. In many cases, these chemicals are hidden or omitted in a list of harmless substances, or their effects are not stated. As a result, the users are not properly informed about what they are purchasing and putting on their nails.

In one instance in the 2000s, many nail polish manufacturers labeled their products as “3-Free,” claiming that they don’t include DnBP, toluene, or formaldehyde. However, a report completed by the Department of Toxic Substances Control in California discovered that almost all nail polish brands claiming to be “3-Free” still contained the toxic ingredients, sometimes even at higher concentrations than companies who did not make the claim.

In addition, removing your nail polish can potentially expose your health to several risks as well. Nail polish remover often contains ingredients, such as isopropyl acetone, methyl ethyl ketone, and n-methyl-pyrrolidone. Brief exposure to these chemicals may result in respiratory and skin irritation, headache, and nausea. N-methyl-pyrrolidone is also an ingredient that can penetrate latex, so even gloves can not provide full protection. The best way to avoid these risks would simply be to look for nail polish removers without these three chemicals.

At the end of the day, is it necessary to completely cut nail polish out of your life? The short answer is no, but there are still things you can do to ensure a healthy experience. Make sure to always keep yourself informed about the chemicals you are putting on your nails. For example, “Skin Deep” is a cosmetics database that allows users to search for safer alternatives, such as water-based nail polishes. OPI, Zoya, and Sheswai are three brands that have been independently tested to be safer nail polish options.

To minimize the contact between the polish and skin, take care of your cuticles by soaking them in warm soapy water or applying cuticle oil as a moisturizer as part of your self-care routine. Keeping all of this in mind will help you enjoy a healthy, toxin-free, and fun experience on your next spa day.

Sources


Rubbing alcohol and hydrogen peroxide are two commonly used antiseptics. Though both can be found at one’s local drug store and are used for cleaning and disinfection, they each have specific purposes that can help fight off bacteria.

Rubbing alcohol is a colorless, odorless substance composed of 60-90% isopropanol, otherwise referred to as isopropyl alcohol. The substance’s main use is killing germs and can be used both on surfaces, such as counters, and the body. For example, deodorants and hand sanitizers are made from rubbing alcohol due to their ability to kill bacteria. However, excess use can lead to the damaging of skin cells. Moreover, it is highly flammable and poisonous due to its high concentration of alcohol.

Hydrogen peroxide contains no alcohol. Instead, its chemical formula, $\text{H}_2\text{O}_2$, is very similar to the chemical formula of water, $\text{H}_2\text{O}$ (the only difference being that the former has two oxygen atoms rather than one). The substance is very strong with a mixture of 3% hydrogen peroxide capable of killing off dangerous germs. However, due to its strength, the substance should not be applied onto the skin and instead only as a surface disinfectant. Interestingly enough, hydrogen peroxide can also be used to whiten one’s teeth and sanitize toothbrushes and retainers.

In the context of helping to fight COVID-19, rubbing alcohol can effectively kill the virus if it is in concentrations of 70% or more. Similarly to rubbing alcohol, hydrogen peroxide can also help combat COVID-19 when in concentrations of 3% or more.

In general, both can be used on most surfaces such as glass, countertops, and doorknobs. However, when disinfecting various fabrics, hydrogen peroxide can cause yellowing and discoloration. Therefore, rubbing alcohol may be the better option in this context.

Additionally, rubbing alcohol needs to sit for 30 seconds before taking effect while hydrogen peroxide needs to sit for 10 minutes. Though both of these substances are very effective and similar in many ways, they each have their respective purposes and should not be confused for one another. Overall, as long as you know each substance’s intended use, they will be effective at eliminating germs.

### Sources


Choate students are at a high risk of burning out due to the challenges of navigating a fast-paced lifestyle with a competitive environment while balancing their heavy workloads, numerous extracurriculars, and social lives. Burnout is a state of emotional, physical, and mental exhaustion that often leads to the loss of interest and motivation, creating an unhealthy cycle of helplessness and resentment.¹

Burnout can affect all aspects of life, including physical health, emotional wellbeing, and social participation. The path to burnout is a gradual one — symptoms may seem small or few at first but can worsen or increase as time goes on. Common symptoms include loss of motivation, a growing sense of failure and self-doubt, detachment from the world, withdrawal from responsibilities, procrastination, difficulty concentrating, and isolation.¹ Burnout can also lead to physical symptoms, such as headaches, fatigue, and change in appetite, and disruptive sleeping patterns.²

Multiple factors in an individual’s life can lead to burnout. Students are especially prone to academic burnout from busy schedules, sleep deprivation, and a heavy workload.² Choate students constantly strive for academic excellence and push themselves to maintain good grades, take difficult classes, participate in clubs, play sports, and handle extracurricular activities. It is difficult to balance and complete all of these activities, but the inability to accomplish all of what one strives for can often lead to a sense of failure and self-doubt. Emotionally, low self-esteem and anxiety can lead to worse performance and loss of motivation.

To prevent and treat burnout, it is important to develop strategies that focus on handling stress and maintain self-care through physical exercise, social activities, a balanced diet, a healthy sleep schedule, and frequent breaks.³ Time management is key — avoid procrastination and set reasonable goals.¹ Take a step back and reevaluate current priorities and question if the desire to take a specific class or participate in an activity is the result of passion or pressure. Try to pinpoint stress factors and unhealthy habits but also make notes of things that bring joy and relaxation.³ Health professionals, faculty, friends, and peers can provide additional support structures and give additional insight on what the next steps should be. This process may look different for everyone, and it’s alright if a clear answer is not reached in a short period of time. Sometimes, it takes trial and error to find the balance that works. Prioritizing personal health, seeking help when needed, and maintaining a realistic and positive outlook are all ways to maintain direction and overcome burnout.

Sources
In 2008, the Nobel Prize in Physiology or Medicine was awarded to German virologist Dr. Haralad zur Hausen for discovering the link between human papillomavirus 18 (HPV-18) and cervical cancer. A critical part in that discovery was the use of HeLa cells, the first “immortal” human cell line. In the 1980s, Dr. zur Hausen noticed that HeLa cells contained strains of HPV-18, one of the most dangerous types of HPV, which enter and turn off the gene responsible for suppressing the formation of tumors in cells of the body. Using that knowledge, scientists developed widely available HPV vaccines that have been credited with reducing HPV infections in teenage girls by about two-thirds.\(^1\) HeLa cells were also used in research to create the polio vaccine.\(^1\) Although HeLa cells played a pivotal role in many other medical and scientific advancements, the origins of their use points to the flaws in the ethics of the medical field.

Henrietta Lacks was a 31-year-old mother of five who was diagnosed with cervical cancer. She stayed at Johns Hopkins Hospital, one of the few hospitals that welcomed Black people in 1951, to receive radium treatments for her cancer.\(^2\) Her surgeon Dr. Howard Jones took a tissue biopsy of her cancerous womb without her consent and passed the sample to Dr. George Otto Gey, a physician and cancer researcher at Johns Hopkins. Lacks was one of many cervical cancer patients whose cells were unknowingly collected by Dr. Gey in an attempt to model human cancer in a test tube to develop therapeutics against the disease. While all other cell samples died, Lacks’s cells continued to divide every 20-24 hours in a laboratory culture with the right nutrients, becoming the first human cell line to be established in culture.\(^3\) The immortality of the cells is due to an overactive version of the enzyme telomerase, which helps to prevent the shortening of chromosome telomeres, cellular aging, and death.\(^4\) The cells were named HeLa after the letters of her first and last names and have been continuously dividing since.

Although the scientific significance of HeLa cells’ discovery is important, it’s equally, if not more important to recognize the fact that the cells were obtained without Lacks’s consent. Lacks’s case has revealed several bioethical issues, such as informed consent, medical records privacy, and communication with tissue donors and research participants. Although the situation was legal in the 1950s, it is neither ethical nor legal by today’s standards. The cells have also been used in unethical ways since the initial discovery. Numerous doctors and scientists failed to ask the Lacks family for consent to publicize her name, medical records, and genome for decades. In 2013, however, things took a turn. After HeLa cells were used to map the first human genome, European scientists...
published her personal genome causing many protests from her family. The map was removed from the public eye and the Lacks family worked closely with the National Institutes of Health (NIH) to create special guidelines for using her genetic blueprint in NIH research which includes a committee partly consisting of two Lacks family members.6

The NIH has also attempted to create changes to the common rule, a set of policies that protect human participants in U.S. funded research.7 The revision would require consent from anyone whose biological specimens have been obtained for research before they are used, even if those samples are de-identified. While early efforts failed to change the rule in 2017, the nationwide recognition of systemic racism in 2020 has opened an opportunity for this to be discussed again.6 COVID-19 has also shown the racial disparities in the medical field as the disease was more prevalent and severe in Black communities. As many tried to atone for the unethical obtention of HeLa cells and improve on the impact of systemic racism in healthcare, the pandemic offered an opportunity to demonstrate fair and equitable practice. HeLa cells were an important part of discovering the molecular mechanics of SARS-coV-2 in humans and its infectivity.8 The vaccine is a critical defense against the coronavirus and its equitable distribution is a pivotal step in breaking down racial barriers in science and medicine.

While the healthcare industry has recognized its flaws and failures towards the Black minority, such as the inequitable treatment of Lacks’s cancer cells, opportunities such as the pandemic will continue to appear as a way to improve upon the treatment of minorities in medicine.

Sources
1. MacDonald A. 5 Contributions HeLa Cells Have Made to Science. Technology Networks. Published 11 March 2022.
NATIONAL PUBLIC HEALTH WEEK: BRINGING UP HEALTH TOPICS AND ISSUES

When the word "health" is brought up, there are typical images of getting the right amount of exercise, visiting hospital settings, and taking an assortment of medications for certain illnesses. However, the public health field encompasses more than the health of an individual. It focuses on the condition of the whole community and how to alleviate health issues to fulfill the community's specific needs. For that reason, the public health field is interdisciplinary in that it can be heavily influenced by biological sciences but also the affected by a variety of social sciences and humanities fields because those have tangible impacts on the health of the community. For example, a community's inability to have access to affordable and quality healthcare can be linked to legislation, economics, and so forth. Environmentalism, which is associated with saving the earth and its natural habitats, can also be linked to a community's health through pollution and changes from global warming. Because issues that affect the health of the community are created by countless other factors, it is important to recognize that only by working together with other fields will the health of the community improve.

To raise awareness of public health topics and issues, the American Public Health Association will be sponsoring national public health week from April 4-10. Each day of the week has a specific topic in attempt to highlight issues people should be more aware about and ways to mitigate them.¹ Below are this year's daily themes:

Monday, April 4 - Racism: A Public Health Crisis
Tuesday, April 5 - Public Health Workforce: Essential to our Future
Wednesday, April 6 - Community: Collaboration and Resilience
Thursday, April 7 - World Health Day: Health is a Human Right
Friday, April 8 - Accessibility: Closing the Health Equity Gap
Saturday, April 9 - Climate Change: Taking Action for Equity
Sunday, April 10 - Mental Wellness: Redefining the Meaning of Health

Sources

STAY TUNED TO OUR EMAIL LIST AND BOARCAST FOR COPY, GRAPHIC, AND LAYOUT EDITOR APPLICATIONS!