



The

HORIZON

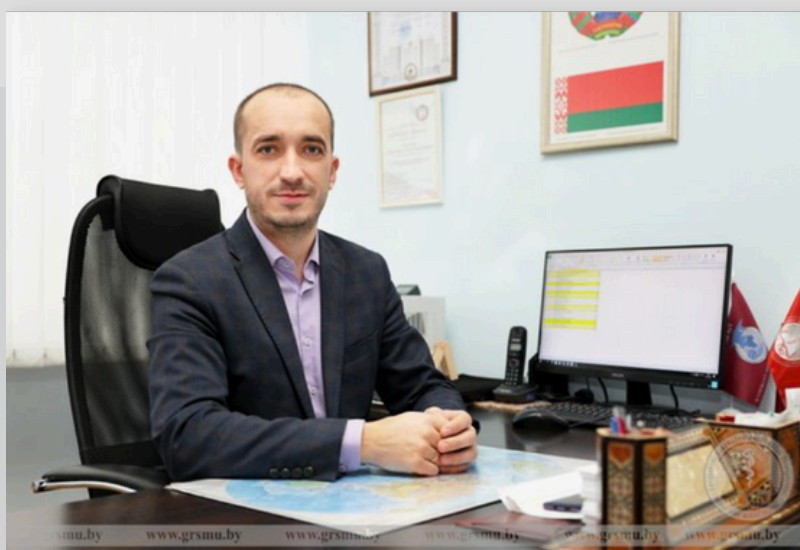
VOLUME 2, ISSUE 05, MAY 2024

- Contemporary Loneliness a Behavioural Epidemic
- We are not aging, We are evolving
- The Ethics of Gene Editing and CRISPR Technology
- Opioids, the double edged sword

DEAN'S DESK



Dear students, we at Grodno State Medical University strive to provide students with top-quality education, but that's not it. GRSMU is also a hub for Scientific, Cultural, and Sports related activities. We wholeheartedly acknowledge that International students are an integral part of our university, and we take immense pride in that. Grodno State Medical University is glad to work with students from different countries and provide them with a stage to represent their nation and culture.



**DEAN OF FACULTY OF INTERNATIONAL STUDENTS
DR. ALEKSANDER ALEKSANDEROVICH STENKO**

GRSMU celebrates its uniqueness in diversity, for in its true essence our university is a junction where students from various backgrounds and cultures come together as one big family. GRSMU has always encouraged students to explore further and beyond in every field they try their hands at. I hope that you like the novel concept of 'The Horizon' - a magazine that serves as a platform for the students to voice their opinions, share their takes and present their points of view.

'**The Horizon**' is a medium of extended communication where we can learn a lot from one another. I highly appreciate this initiative and personally support it. I look forward to reading the interesting blogs written by you.

WELCOME TO THE HORIZON



“We all have fascinating stories to share!” For the longest time, I have had this idea of starting a magazine. But not just any conventional magazine, one that shall serve as a platform for the students and alumni of International faculty at Grodno State Medical University to share their stories. A platform that enables students to share their takes on various curricular and extracurricular aspects of medicine. Thus, the idea of **‘The Horizon’**, came to life.



**DR. MEHUL H. SADADIWALA, FOUNDER,
CLASS OF 2023**

‘The Horizon’ will be a creative intersection where students can freely give commentaries about Lifestyle, Culture, Productivity tips, and more. Throughout the years, many individuals at GrSMU have inculcated valuable skills and gained experience with a fair share of success in various disciplines. Maybe you run a successful YouTube channel or an educational website, or maybe you are a successful student-researcher or an educator, and so much more. 'The Horizon' enables students to share their personal experiences. The insights that you share will encourage other students to take further strides and explore future possibilities.

‘The Horizon’ is supported directly by the Dean of the International Faculty, and it will operate under the supervision of the International Students' Scientific Committee. Students from 1st to 6th year, and even graduates, can submit their blogs to this magazine. The articles should directly or indirectly revolve around student life to share knowledge and the collective growth of students.

For inquiries and submissions.

📷 - grsmu_science

✉ - grsmuscience4life@gmail.com, socialmedia3490051@gmail.com

EDITOR'S DESK



“ I'm a sixth-year medical student at Grodno State Medical University, Belarus. My passion for academic excellence is matched only by my commitment to fostering a culture of creativity and collaboration among my fellow researchers.

I believe that research is not only a scientific activity but also a creative and social one. I am always excited to take on new challenges and share my knowledge with others. Ultimately my goal is to use research to make a positive impact and change the world for the better.

As the Editor-in-Chief from April to June 2024, I am privileged and pleased to oversee the diligent efforts of all our authors in offering our readers the highest quality perspectives on compelling subject areas. I extend a warm invitation to all members to contribute their perspectives and engage in discussions this upcoming year as we collectively delve into the prospects of Horizon Magazine. ”



POORNA GAYAN WATTALADENIYA
EDITOR-IN-CHIEF (APR-JUN, 2024)

“ I hold a degree from Grodno State Medical University in the year 2022. Presently, I am engaged in my clinical training at a governmental medical institution in Surat. My profound interest lies in the intricate mechanisms and physiological interplay within the human body, thus propelling me towards further exploration in the realm of medical sciences. Medical science, akin to a vast ocean and an infinite road, remains insatiable in its quest for knowledge. Hence, it is incumbent upon us to make our humble contributions towards its continuous advancement, benefiting not only ourselves personally and professionally, but also society as a whole.

As the chief editor from April to June 2024, I will assist my junior colleagues in their research endeavours, fostering a collaborative environment conducive to mutual learning. I extend a cordial invitation to fellow researchers to share their areas of interest for collective deliberation, culminating in a scholarly masterpiece ”



DR. BHALALA PRIYANK BATUKBHAI,
EDITOR-IN-CHIEF (APR-JUN, 2024)

And a message to our dearest readers, we would like to invite you all, students and alumni, to share with us the blogs that directly or indirectly revolve around student life, to share knowledge and experiences that has had an impact on your growth within and outside the bounds of our university.

Concluding, let us alter the limitations of our individual efforts and collectively explore limitless Horizons.

Cover Credits

Fathmath Zuha Ali

For enquiries and submissions.

📧 - grsmu_science

✉️ - grsmuscience4life@gmail.com, socialmedia5490051@gmail.com

CONTEMPORARY LONELINESS A BEHAVIORAL EPIDEMIC

This blog is about exploration of the human connection we've lost in modernity. The ignored emotion - loneliness

WRITTEN BY
LAKKITHA WIJAYARATNE
CLASS OF 2025

INTRODUCTION

Firstly I would like to paraphrase the Indian Philanthropist and Entrepreneur Geetanjali Kirloskar: "In the upcoming 5 years following graduation, what matters the most are the relationships and networks which are built. They will act as buffers and pillars of support when the going truly gets difficult within the time that you have ahead of yourself."

When starting to write this blogpost these words struck a chord within me, as I myself, am just finishing off my penultimate year here with my fellow batchmates and so are many of my other peers soon awaiting their graduation this year. The question of: what next? And the realization of the rather immense amount of awaited freedom and responsibility, spearheaded my curiosity in exploring the bonds between people as they start living their supposed "Adult" lives.

Upon just a shallow exploration of some post-COVID articles this concept of "contemporary loneliness" revealed itself. Let me start by asking you the reader: When was the last time you felt truly lonely? Be it lack of romance, a lack of family or simply felt isolated from your own friends.



THE 'WHY' & THE 'WHAT'

At least from personal experience, quite a few of us would have encountered this feeling. This is further supported by the recent launching of the WHO Commission on Social Connection, co-chaired by the US surgeon general Vivek Murthy who brought into attention the epidemical nature of the problem earlier last year with the release of an Advisory.

Within which it was revealed that loneliness can lead to considerably greater risks of stroke and other cardiovascular disease progression; development of dementia and even increase the chance of premature mortality. These health risks posed to the individual are even attributed to be similar in regard to that of smoking, alcoholism and obesity. In the same line of thinking that a healthy individual means a healthy population, beyond the direct benefits of reduced morbidity and mortality (population health), we see the tendency that higher levels of social connectedness suggest better community outcomes, ranging from community safety to resilience, prosperity, and representative governments. Ergo: social connection = Better individual health + Better community health and progress.

Now that we've explored in broad strokes the need for social connection to combat loneliness, let us now define the term. Loneliness and thereby a lack of social connection is a feeling of subjective distress encountered due a discrepancy between an individual's perceived social experience and their desired expectation of social experience, be it, in terms of quantity, structure or quality of the latter.

And it must be noted that meaningful connections are the crux of the expectation we as a species will always delve into; we have an inherent desire to be creatures of a social nature, even though each individual would have their own ideals on the matter.

THE POPULATIONS TO PROTECT

As Dr Atul Gawande illuminated in his book “Being Mortal”, and as most of us with grandparents can see within our own lives: the older generations tend to get very lonely. Age related decline of physical and mental functions lead to the loss of societal working capacity and forces people to adapt to a novel way of socialization. If one is successful in achieving this adaptation with the help of friends and family most of the time, it is indeed a brighter prognosis than the opposite.

For decades the classic populations at risk of the loneliness epidemic have been the geriatric populations due to their isolations in healthcare facilities and care-homes, however our change in values to favour individualistic achievement and the immense digitalisation of our lives have become the harbinger of the loneliness epidemic to the younger generations of our population. In other words, according to recent surveys: adolescents and young adults now have some of the largest figures of loneliness within the population, in especially the developed world.

Perhaps you may also be able to bring into memory: youtube videos garnering millions of views of teenagers discussing their feelings of isolation and lack of “real friends”; lyrics that hit a little too close to heart like “Modern loneliness, we're never alone. But always depressed, yeah. Love my friends to death. But I never call and I never text.”; and simply the general unrest and anxiety of people, to make connections with one another beyond their self serving mind games.

In other words we have a bimodal distribution of the problem with a major focus needed to resolve the issue among the upcoming working population.

HISTORY IS OUR MISTRESS

So how did we exactly arrive at the status quo? For that let's try to focus on the root of the problem at hand. As I alluded to before, as our societies grew from small isolated communities to bustling cities and then the eventual evolution connecting one another at a global scale, the separations between us simply vaporized. (Perhaps an ecumenopolis is just around the corner.) This manifested as a change in our value system of success.

We started to see the forest instead of the trees and moved to change the features of the individual leaves. To explain that analogy: as caste systems of ancient times demonstrate, a farmer's son will become a farmer and a maid's daughter will become a maid. But with progress in industry and education more pathways opened up to facilitate the individuals' growth in a wide array of fields.

We as a species have always been an ambitious bunch, therefore it's not a stretch to imagine that: when given a relatively accessible path favouring the uplifting of an individuals' potential and improvement, it caught on like wildfire.

From the start of industrialization of the last century, we have become goal oriented and we strive to gain that individual success; to be in the top 1%, to be world renowned; to be the best etc.

Along with the development of industry and infrastructure of travel we also saw the rapid takeover of the communications sphere by means of digitalization. Technology has in eventuality replaced the human connection we used to share more liberally.

Honestly, think and see how long you, yourself spend staring at a screen compared to actually talking to or embracing someone, or simply enjoying solitude.

This has led us to an extent of unlearning how to connect with other people. Especially among the gen Z populace we see this lack of ability to its logical extremes, with more and more parents struggling to strike a balance between their children's online and offline lives and relationships.

Compared to in person relationships, online ones require to be approached with a certain level of skepticism and distance, so there is no replacing the social connection attained physically. Thereby we now have an ever increasing population of individuals having difficulty in finding meaning and validity in physical social connections.

The ignorant and simple solution to which in recent times is ofcourse turning towards addictive behaviors running after that dopamine rush.

FRAMEWORKS MAKE THE DREAM WORK ;

Alright, with this lets build ourselves a framework of the causative roots of loneliness. First of all, is the dependance on independence. With the availability of so many resources one can get quite far in life with their own efforts only, not being bogged down by time consuming personal relationships. And with the world's cultural norm of having a library of Alexandria in our pockets we have access to all the information and so many services we may desire. It's not then at all unbelievable that in that case we try to get a lot done on our own, even perhaps convincing ourselves that we shouldn't disturb others. Then comes the fact that the world itself is an inherently stressful place.

From school recitals, college applications, to integrating into the job market, everything has become a competitive nightmare to overcome. Recent studies also suggest that mental illness acts as a comorbidity in a significant number of cases of mortality, even among the top rankers of cancer, CVD and metabolic syndrome.

Partly it's due to better diagnosis of mental disorders, however the point stands that loneliness can act as a precipitating factor to such diseases and vice versa. And finally the increasing lack of practice in regards to handling physical relationships have deteriorated our social skills to a point that simple listening, being present in the moment, holding space, and responding empathetically have become novel concepts that needs to be taught and relearned.

THE TUNNEL'S LIGHT

The reliance on independence has given birth to efforts of curbing loneliness by oneself. I mean if you are lonely just go to a party or gathering and develop your small talk. If you have anxiety, just drown it down with some alcohol and get out there! This all stems from a desire to relieve yourself of the dissatisfaction of being alone. But the paradoxical nature of this issue is that: loneliness is a problem that you cannot solve on your own. It requires the active participation of another that makes you feel understood, taken care of, heard of, and connected to.

Think about it, you can spend an hour at a party with 10 people but feel the most connection to the 10 minutes you told your partner about your day.

This also comes with the added benefit of a healthy release of oxytocin when we help another, thereby making us also feel good. Practices of meditation, gratitude journaling and in general living life with introspection have shown to be vital in developing mindfulness, which in turn helps with paying attention the person and moment in front of you.

While we can discuss care centers, better access to mental health services, social initiatives like running groups, art classes etc, the vital role still remains in the hands of you and I. We must reach out and connect with those that need it.

Everyone is wearing a mask and it's up to us to truly be tolerant, accepting and compassionate enough to reach out and learn about one another and slowly allow the person within the mask to flourish, inturn we also flourish. As a final note, go give a call to that friend or relation, and ask them about their day :)

References

- Surgeon General Issues New Advisory About Effects Social ...HHS.gov<https://www.hhs.gov/about/news/2023/05/23/surg>
- <https://www.theguardian.com/lifeandstyle/2024/jan/29/us-surgeon-general-vivek-murthy-loneliness-mental-health-epidemic-social-media>
- Loneliness - The Silent Struggle We All Feel YouTube · HealthyGamerGG354.9K+ views · 12 months ago
- Simon Sinek. "I FEEL LONELY!" How To Deal With Loneliness ...YouTube · The Diary Of A CEO2.4M+ views · 1 year ago
- https://www.researchgate.net/publication/333617678_The_Wellness_Clinic_A_model_of_integrated_care_to_address_the_physical_health_of_people_with_severe_mental_illness_and_more

WE ARE NOT AGING, WE ARE EVOLVING

This blog is about aging, the changes our body undergoes and how we can accept it with grace with some valuable measures to slow the aging process.

WRITTEN BY
SAARAH DHILFER
ALLAHUDEEN
CLASS OF 2026

WHAT IS AGING?

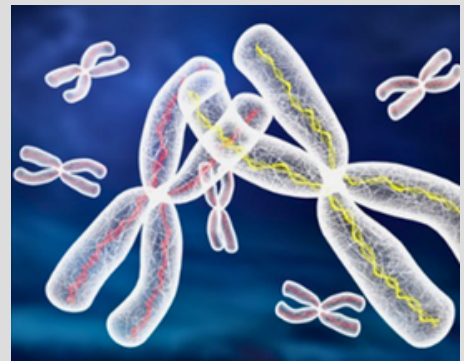
No one knows how and why people change as they grow old. Think of aging as the way our bodies evolve over time which includes a variety of processes that the human body undergoes as it ages, compared to what is commonly called signs of ageing such as grey hair and wrinkles.



EVOLUTIONARY THEORIES OF AGING

Aging makes us less healthy, so why should such a deleterious process evolve? The answer is that aging has not evolved because it's beneficial, but as a side effect of something else. This is wound up from two conventional theories of aging proposed by evolutionary biologists Peter Medawar and George Williams back in the 1950s and 1960s.

According to Peter Medawar's theory of 'mutation accumulation', until the first reproduction, the power of natural selection remains high. Then it's going to get weaker with age. It means that reproduction is the primary goal of an organism and until then, natural selection will preserve cellular processes which are essential to survival. As soon as an organism reproduces, there is no evolutionary pressure to maintain its existence. The cell's processes decline, the organism ages and ultimately dies.



George Williams' theory of 'antagonistic pleiotropy' states that natural selection can favor gene variants with beneficial effects early in life, even if the same variants have deleterious effects later. These genes have little evolutionary impact because their deleterious effects occur in old age after the reproductive stage.

WHAT'S HAPPENING IN YOUR BODY AS YOU AGE?

Cardiovascular system

Most common ones are that the blood vessels can stiffen, blockages can build up, and the system may become prone to inflammation, resulting in increased risk of heart attacks, heart failure, and other cardiac dysfunction.

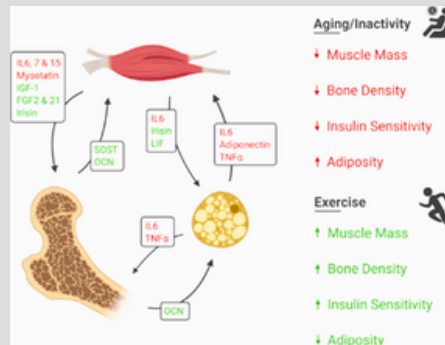
What you can do to promote the health of your heart:

- Healthy heart diet- whole grains, fruits and vegetables, fat-free and low-fat dairy products, and proteins from fish, lean poultry, or plant-based sources like beans, nuts, and seeds, and is limited in salt and added sugar.
- Avoid smoking
- Staying active by introducing physical activities into your daily schedule
- Getting adequate sleep
- Control your stress by meditation or breathing exercises



Muscular skeletal system

Muscles may become rigid with age and may lose tone. Bones becomes more fragile and brittle. The total height decreases primarily because the trunk and spine shorten. The breakdown of the joints may lead to inflammation, pain, stiffness and deformity.



WHAT CAN YOU DO TO NURTURE THE HEALTH OF YOUR BONES AND MUSCLES?

- Get adequate amount of Calcium (RDI- 1300mg for adults) and Vitamin D (RDI- 600 IU/ 15mcg)
- Include weight-bearing exercises such as jogging, climbing stairs in your daily routine
- Maintain a healthy weight
- Quit smoking, as it lowers bone density
- Practice and maintain the right postures as it helps to transfer weight and stress equally throughout our skeletal system. This reduces the tension on specific joints, thereby preventing premature tear and damages.

Digestive system

Even though aging doesn't have an impact on the digestive system as much as other organs in the body, it is a risk factor for some issues, including colon cancer, acid reflux, stomach sensitivity to medications and a decreased absorption of some vitamins, the most common being constipation due to the structural changes (atrophy) in the large intestine.

WHAT CAN YOU DO TO PREVENT CONSTIPATION?

- Increase your intake of fibre through diet
- Drink 1.5-2 litres of water daily to hydrate the body
- Don't ignore the urge to have a bowel movement

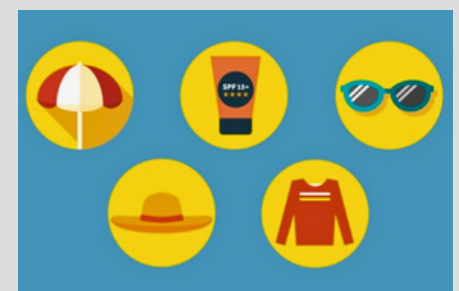
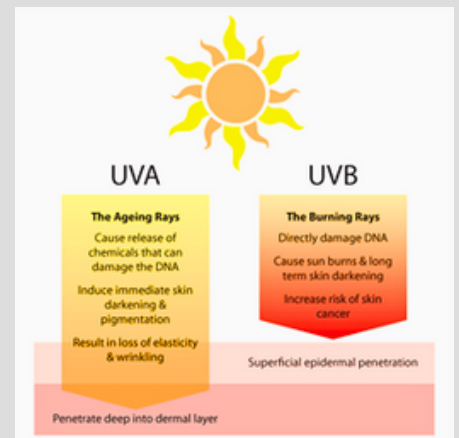
Integumentary System

Our skin becomes rougher, more transparent; due to thinning of epidermis, more easily bruised as our blood vessels become thinner, more fragile, and slacker due to loss of elastin.

Also, hair growth slows down. Hair strands become smaller and have less pigment. So the thick, coarse hair of a young adult becomes thin, fine and bright.

HOW TO PREVENT PREMATURE SKIN AGING?

Use a sunscreen with iron oxide and an SPF of 50- that prevents visible light, which causes pigmentation problems and blue light, which causes skin aging, similar to UVA light.



- Avoid repetitive facial expressions as it leads to the contraction of underlying muscles. Hence these lines become permanent when you're constantly contracting the same muscles for several years. It can help reduce the lines caused by squints if you wear sunglasses.
- Wash your face twice a day and after you've been sweating.
- Apply a moisturizer every day

Anti-aging hair care tips:

- Moisturize hair
- Check the labels on your hair care products
- Avoid style heating
- Hair washing has to be done according to one's hair type
- Wear tight-fitting swimming caps when swimming
- Stress control



Sensory organs

Your senses get weaker, as the amount of stimulation required to make the brain aware of the sensation increases. Hence the ability to focus on nearby objects, following a conversation in a crowded room, loss of taste and smell is prevalent.

HOW TO PROTECT THE SPECIAL SENSES?

Eye health

- Consume foods rich in Vitamin A, C and E.
- Take regular breaks from your screen every 20 mins.
- Wear sunglasses to block UV lights
- Get an eye examination annually
- Maintain normal blood pressures-quit smoking, manage diabetes.

Ear health-

- Wear ear plugs in noisy places
- Try to keep volume less than 50% in quite areas
- Don't clean the ears using a cotton bud as you may be pushing some earwax deep inside and this may damage your eardrums.
- Keep your ears dry to avoid infections



Acceptance is the core of aging well, so live in the moment and be kind to the little child within you.



THE ART OF GRACEFULLY AGING

Ageing is inevitable, but you're free to make choices that will improve your ability to live an active life, to do things that you enjoy and to spend time with your loved ones.

References:

1. <https://www.mayoclinic.org/healthy-lifestyle/healthy-aging/in-depth/aging/art-20046070#:~:text=jooints%20and%20muscles-,What's%20happening,your%20coordination%2C%20stability%20and%20balance.>
2. <https://www.aad.org/public/everyday-care/skin-care-secrets/anti-aging/reduce-premature-aging-skin#:~:text=One%20thing%20that%20we%20cannot,some%20of%20its%20youthful%20fullness.>
3. Aging changes in the senses: MedlinePlus Medical Encyclopedia

THE ETHICS OF GENE EDITING AND CRISPR TECHNOLOGY

This blog is about ethical complexities surrounding CRISPR technology and gene editing.

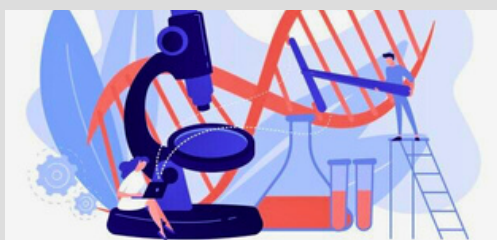
WRITTEN BY
KRUSHI PATEL
CLASS OF 2024

INTRODUCTION

In the realm of biotechnology, few innovations have garnered as much attention and controversy as CRISPR technology. Clustered Regularly Interspaced Short Palindromic Repeats, or CRISPR, is a revolutionary gene-editing tool that allows scientists to modify DNA with unprecedented precision. While its potential for curing genetic diseases and advancing medical science is immense, the ethical implications of gene editing cannot be overlooked. This blog delves into the ethical complexities surrounding CRISPR technology and gene editing.

UNDERSTANDING CRISPR TECHNOLOGY

CRISPR is a versatile and powerful tool that allows researchers to precisely alter DNA within living organisms. It works by using a molecule called RNA to guide an enzyme called Cas9 to a specific location in the genome. Cas9 can then cut the DNA at that location, and when the cell repairs the DNA, it may introduce changes, allowing for the addition or removal of specific genetic material.



THE PROMISE OF CRISPR TECHNOLOGY

CRISPR technology has the potential to revolutionize medicine and biology. It can be used to correct genetic mutations responsible for hereditary diseases, opening the door to gene therapy for conditions like cystic fibrosis, sickle cell anemia, and muscular dystrophy.

It also allows for more efficient drug development, the creation of genetically modified organisms for research and agriculture, and better understanding of the human genome.



THE ETHICAL DILEMMAS

1. Germline Editing: One of the most significant ethical concerns is the modification of germline cells, which would result in changes that are inherited by future generations. This raises questions about the unintended consequences and the potential for designer babies.

2. Consent: Ensuring informed consent is a challenge, especially when it comes to editing the genes of unborn children or those unable to provide consent themselves.

3. Unintended Consequences: Gene editing is not without risks, and the unintended consequences of altering genes could lead to unforeseen health issues. The ethical question here is whether we are justified in experimenting with these risks.

4. Socioeconomic Disparities: Access to gene-editing technology is not equal, potentially exacerbating socioeconomic disparities. This raises concerns about who gets to benefit from this technology.

5. Ethical Boundaries: Where do we draw the line when it comes to editing genes for non-medical purposes, such as enhancing physical or cognitive traits? What's considered an acceptable or unacceptable use of this technology?



REGULATIONS AND OVERSIGHT

The ethical concerns surrounding CRISPR have led to calls for regulations and oversight. Many countries have established guidelines for gene editing, emphasizing the importance of transparent and responsible research. Scientific organizations and institutions are working on developing ethical frameworks to guide the use of CRISPR.

CONCLUSION

CRISPR technology is undoubtedly a groundbreaking scientific achievement with the potential to alleviate human suffering and advance our understanding of genetics. However, it also presents complex ethical challenges that require careful consideration.

Striking a balance between innovation and ethical responsibility is crucial. As this technology continues to evolve, open dialogue among scientists, ethicists, policymakers, and the public is essential to ensure that CRISPR is used in ways that benefit humanity while respecting fundamental ethical principles.

References

1. Doudna, J. A., & Charpentier, E. (2014). The new frontier of genome engineering with CRISPR-Cas9. *Science*, 346(6213), 1258096. DOI: 10.1126/science.1258096
2. National Academies of Sciences, Engineering, and Medicine. (2017). *Human Genome Editing: Science, Ethics, and Governance*. National Academies Press. DOI: 10.17226/24623
3. Ishii, T. (2019). Germline genome-editing research and its socioethical implications. *Trends in molecular medicine*, 25(4), 285-297. DOI: 10.1016/j.molmed.2019.01.009
4. Baylis, F., & McLeod, C. (2017). First, do no harm: ensuring the ethical design of gene editing technologies. *American Journal of Bioethics*, 17(9), 36-47. DOI: 10.1080/15265161.2017.1360995

OPIOIDS, THE DOUBLE EDGED SWORD

This blog is about how pain and pleasure are two closely intertwined feelings that we as humans have learned to both love and hate in different proportions.

WRITTEN BY

ARSAKULASOORIYA JUWAN
ARACHCHILLAGE KAVINDYA
KAVINDI FERNANDO

CLASS OF 2025

INTRODUCTION

Pain and pleasure are two closely intertwined feelings that we as humans have learned to both love and hate in different proportions. Although seemingly contrasting, both have shown to be at the center point from which many decisions and actions that we make resonate from.

The main sources people opt for is the usage of drugs to achieve the sense of euphoria. But as we all are aware of, there is an extreme substantial disadvantage to the usage of drugs that can lead to drug use, abuse and addiction which is certainly also a result of these two factors – whether it is to alleviate pain, escape from actual problems or to find pleasure.

However it may begin, it eventually leads to a cycle of dependence, harm and deterioration when abused. We must ask ourselves, “how does one start taking drugs?” Well, it depends, some individuals might start from pure peer pressure from society, or some take drugs to fit in with the popular crowd, these circumstances are witnessed in teens and young adults, but for some, it’s to escape reality. But are you aware that drug addiction can also begin with a simple prescription from a doctor? This prescription is prescribed for pain relief from an injury or surgery. One of the main drug groups that are utilized medically for pain relief but also used for drug addiction are opioids



WHAT ARE OPIOIDS AND THEIR MECHANISM?

Opioids are a group of drugs that are either derived naturally from opium poppy plant or mimic their effects, they interact with our brain cells to produce morphine like effects. These opioids can be Fentanyl, Morphine, Oxycodone etc. They are also sold illegally, which we all have heard of as Heroin.

The duration of opioid intake is the first major step to decide whether one can result into an addict in the case of medically induced addiction, as even short-term opioid usage can lead to addiction.

This is because opioids have a mechanism that can activate powerful reward centers in the brain. They mimic the natural chemicals occurring in our body called endorphins.



THE POWER OF ENDORPHINS

Endorphins are neurotransmitters created and released by the pituitary gland and hypothalamus in the brain.

They function to alleviate pain, lower stress, give a positive state of mind, and enhance the sense of well-being. Endorphins are released by the body during any kind of pleasurable activities such as sex, working out, and by eating. There are about 20 subtypes of endorphins.

Beta endorphins are the type that is responsible for blocking the perception of pain and that gives the euphoric sensation. This mechanism takes place when they bind to the brain's reward centers that are known as opioid receptors.

There are three types of opioid receptors "mu, delta and kappa", but the main role of analgesia is played by the mu receptors, as these receptors function for euphoria and mountains for rewards.

When they are bound, a cascade of reactions takes place that results in the inhibition of the release of a protein mediator called tachykinin, distinctly a substance P, that is involved in the transmission of pain, which then carry out the signals across the nervous system. The analgesic process begins here, with the boost of euphoria, and by muffling the perception of pain.



SO, WHAT HIJACKS THE BRAIN TOWARDS ADDICTION?

The euphoria attracts recreational use and frequent use of opioids leading to addiction. Opioids attach to these same receptors and give off a more effective potent action than endorphins do.

Synthetic and semi synthetic opioids mainly bond more efficiently to the opioid receptors compared to opiates, so therefore it leads to a greater sense of pleasure and greater relief which leads to what we know as "runner's high".

Along with the characteristic features of runner's high, it also offers its fair share of withdrawal symptoms that manifests itself by persistent dependance of the strong drive to use opioids. We must also understand that long term use or increase in dosage of these drugs can also disrupt the normal physiological functions in our body and can lead to chronic diseases, such as depression of respiratory centers in the brain, sleep disorders, anxiety, depression, immunosuppression, reduction in gut activities and they also develop Opioid Induced

Hyperalgesia (OIH), which is a condition that occurs with the long term use and high doses of opioids resulting to an abnormal increase in pain sensitivity.



In some cases, with the increase in dosage, it can result to a medical crisis known as overdose, as we have mentioned earlier it can cause threatening side effects like respiratory depression, with decrease in heart rate, constricted pupils, they can have bluish lips, fingertips, loss of consciousness and eventually death!

CONCLUSION

We all should be educated about the long-term harmful actions with the use of pain killers, we must also be educated on substance abuse and addiction. If we are to be prescribed drugs for pain relief, we must stop as soon as the severity of pain improves. Individuals must seek professional support through rehabilitation centers when necessary.

References:

1. How opioid use disorder occurs - Mayo Clinic
2. <https://emedicine.medscape.com/article/287790-overview#a6>
3. <https://www.healthline.com/health/substance-use/what-are-opioids#what-they-do>

Our Editors	
1	Mehul Hitesh Sadadiwala (Jan-Mar, 2023)
2	Anjelo Leard (Apr-Jun, 2023)
3	Krishna K. Gandhi (Apr-Jun, 2023)
4	Zaakiya Ganem Zamzam (Jul-Sep, 2023)
5	Hardik Bakulkumar Mevawala (Jul-Sep, 2023)
6	J.N.A. Chamathi Dewanga De Silva (Oct-Dec, 2023)
7	Fathimath Naufa (Oct-Dec, 2023)
8	Aroosha Ibrahim (Jan-Mar, 2024)
9	Mitchell Martha Arufinu (Jan-Mar, 2024)
10	Poorna Gayan Wattaladeniya (Apr-Jun, 2024)
11	Bhalala Priyank Batukbhai, (Apr-Jun, 2024)

Cover Credits
Fathmath Zuha Ali

Photo credits