



The **HORIZON**

VOLUME 1, ISSUE 3, MARCH 2023

LIFESTYLE, PRODUCTIVITY, CULTURE & SO MUCH MORE.....

5G Powered Robotic surgery

Understanding and conquering depression

Splash of Aqua

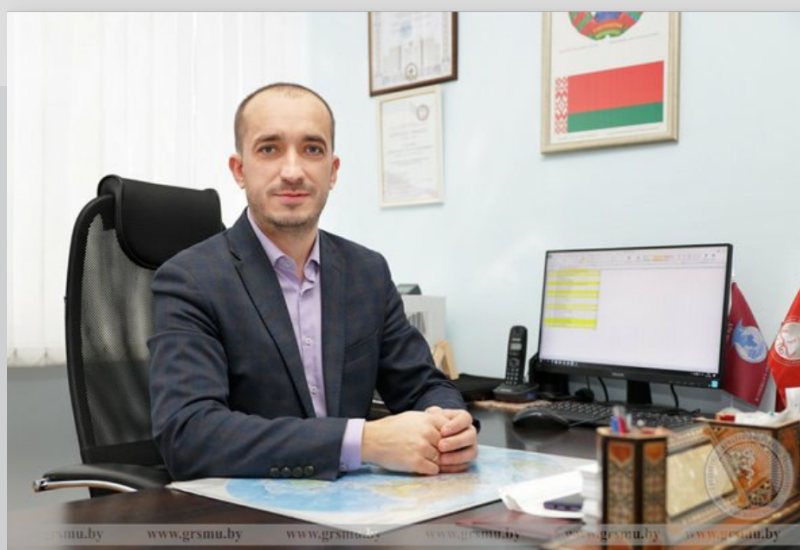
Cultural Competence in Bedside Medicine



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.

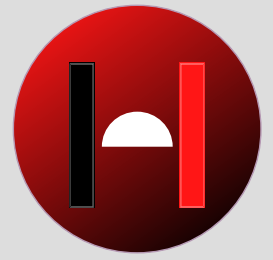


DEAN OF FACULTY OF INTERNATIONAL STUDENTS
Dr. ALEKSANDER ALEKSANDEROVICH STENKO

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.



**MEHUL H. SADADIWALA, FOUNDER,
EDITOR-IN-CHIEF (JAN-MAR, 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.

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5G POWERED ROBOTIC SURGERY

WHAT IF SPECIALIST SURGENTS MILES AWAY COULD PERFORM SURGERIES ON YOU?

The highlight of this blog is to understand the use of 5G powered robots to carry out complex surgeries while breaking free from the limitations of distance between surgeon and patient.

WRITTEN BY
W. F. RASHINA SHANANI
CLASS OF 2025

The field of robotic surgery has become more popular and significant in modern medicine. It has been adopted in many large hospitals in US within recent years and has become a standard for various procedures. The fifth generation (5G) networks have been deployed by various telecom companies in multiple countries worldwide



This advancement serves as grounds for emerging novel therapeutic applications. Its cost, compatibility and infrastructure remain the only limitations. Researchers are working to overcome the limitations and comprehend the potential benefits.

The challenges created by recent pandemic COVID-19, have increased the need for telemedicine. 5G enables doctor's miles away from patients to do surgeries on them.

Robotic surgical systems have been in development for over 40 years. There is a growing demand from patients and clinics for minimally invasive surgery coupled with higher procedure success rate, this can be provided by surgical robots. Current robotic surgeries also require the surgeon to be located in near vicinity of the patient where they can control the robot via a monitor. This is the point where 5G technology comes into play.

Advancements in 2G, 3G, and 4G mobile networks have drastically improved wireless internet services. 5G networks provide a high data transfer rate at 10 GB/s. 5G networks have developed a "network splicing/slicing" scheme that divides the network architecture into multiple networks specialized in one specific function.

These advancements allow 5G networks to achieve higher data transfer speed, communication, reliability, and ultra-low-latency than 4G networks.

World's first remote surgery was performed by Jacques Marescaux in 2001. A 68-year-old woman had her gallbladder removed in Strasbourg, France, operated by the surgeon in New York. The surgery was conducted over high-speed fiber optic connections. This operation itself is named as Operation Lindbergh.

Although such surgical practices had not been integrated into basic surgical practice immediately after 2001 due to technological barriers that included high latency. In March 2019, clinicians remotely controlled implants for deep brain stimulation (DBS) through 5G to treat Parkinson's disease and brain ailments.

Most recently Liang Xiao, a surgeon carried out a gallbladder operation through 5G-powered and four-arm endoscopic model robot, in Zhejiang province, on Feb 16, 2023.

There is also an increased need for surgical expertise in rural locations in various countries worldwide. Leveraging the new technology could help fill the current lack of surgical expertise as well as the extended travel time required for cancer patients requiring robot-assisted surgical management.

Remote tele-mentored collaboration could help expand knowledge between clinicians in real-time, increasing medical aid where 5G networks have been established.

The high-speed data transfer could allow large volumes of research and data collection to be shared in real-time. This has become a huge step in the modern medical world where expert surgeons are able to perform complex procedures without any geographic barrier. But still there are some questions which need to be addressed.

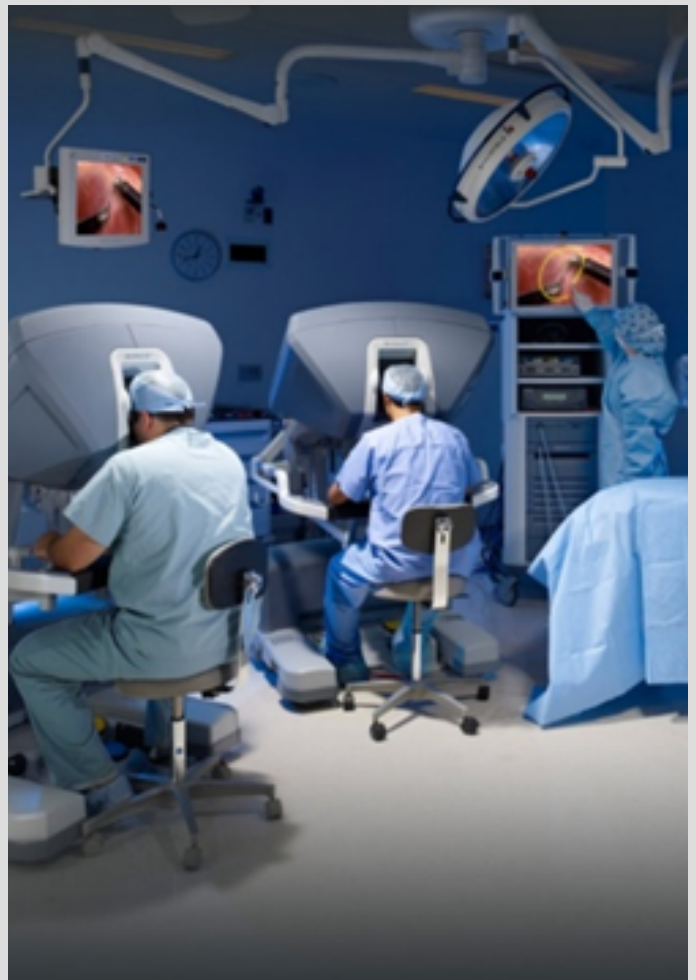
How to perform preoperative assessments and evaluation of patients' conditions?

How can we be assured that qualified and experienced surgeons are readily available if there is a need for intraoperative intervention during the surgery?

What steps should be taken in the case of postoperative complications that sometimes require open surgical maneuvers?

How to follow up patient with regards to postoperative care?

How to evaluate the responsibilities of remote surgeons?



However, the most important issue has been addressed which means other barriers will never become a problem in the near future. We are cautiously optimistic about these new trends, although there is still a long way to go to achieve smart healthcare.

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UNDERSTANDING AND CONQUERING DEPRESSION

The highlight of this blog post is understanding the hormonal changes that occur in depression and the behavioral tools that can help overcome major depression.

WRITTEN BY
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Depression has two forms: bipolar depression and major depression, also called unipolar depression.

Bipolar depression, sometimes called bipolar disorder, is characterized by manic highs followed by periods of crashes, feeling very low and lethargic. However, in this blog, we are discussing major depression because it doesn't have the highs and lows. It's more characterized by continuous lows.

Major depression affects around 5% of the population. That means if you're in a class of 100 people, 5 of them are dealing with major depression or have at some point in their life dealt with it. Before moving forward, it is necessary to understand that accurate diagnosis and treatment of any mood disorders requires advice from qualified healthcare professionals.

Clinical depression has specific diagnostic criteria, including a lot of grief, sadness, anhedonia (a general lack of ability to enjoy things), guilt, and antiself-confabulation (as if a brain circuit that writes stories just starts generating content), along with a threshold to cry, which is often considered a signature symptom of depression.

Other symptoms include vegetative symptoms, which occur without any thinking or doing, such as early waking and not being able to fall back asleep despite being exhausted, and decreased appetite.

Understanding which hormones are involved, their relation to specific symptoms, and the brain circuits affected in major depression can help in overcoming this condition. Additionally, there are scientifically proven behavioral tools that can adjust the level of a particular hormone and provide relief for some symptoms of major depression, even helping to lower the required dose of medications. However, effectiveness will depend on the individual.

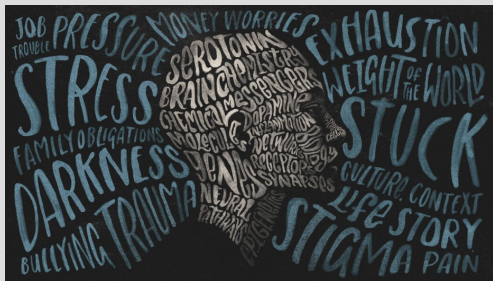
In this blog, you will learn about why different hormonal changes are the culprit behind major depression and how to conquer it.

Epinephrine is thought to be related to the so-called psychomotor defects, and a reduction in epinephrine is behind the lethargy and exhaustion.

Dopamine is thought to be related to anhedonia. Serotonin is thought to be related to grief, guilt, and other emotional aspects of depression.

Serotonin, also called 5-HT, essentially derives from a precursor called tryptophan, which is found in turkey and carbohydrates. Tryptophan is eventually converted into serotonin.

Now, there is growing evidence that many forms of major depression, if not all of them, relate to excessive inflammation. This inflammation can lead to or exacerbate depression, and focusing on reducing inflammation and its associated pathways is a really good thing to do. When we are chronically stressed, inflammatory compounds like IL-6, TNF-alpha, and C-reactive protein cause inflammation of brain cells, in particular glial cells, which are typically thought to be support cells. These cells start to become disrupted.



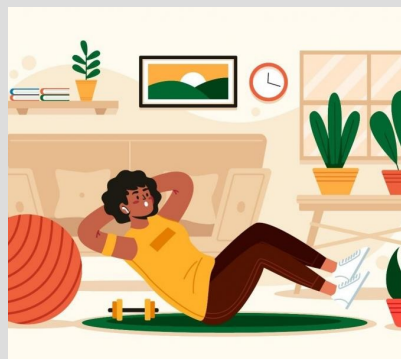
These inflammatory cytokines act in a variety of different ways, but they mainly act to inhibit the release or synthesis of serotonin, norepinephrine, and dopamine.

To limit inflammation and to relieve some or all of the symptoms of major depression, one approach is to increase our intake of so-called EPAS or essential fatty acids. When people ingest a certain level of EPA, like omega-3 fatty acids, the relief from depressive symptoms matches the effect of SSRIs. Some studies have shown that increasing our intake of these essential fatty acids, in particular the EPA variety of omega-3s, can lower the effective dose of the SSRIs. The threshold level seems to be about one gram or 1000 milligrams of EPA.

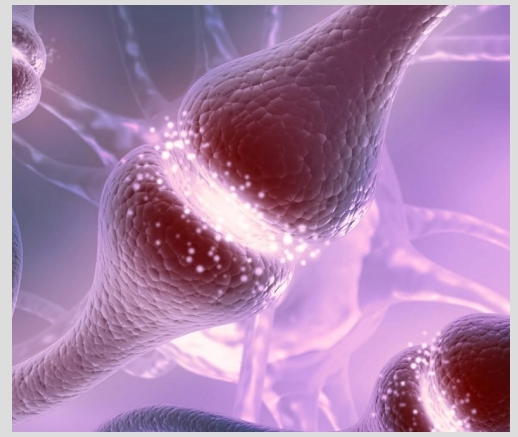
Another deeper biological phenomenon to understand is that these inflammatory cytokines cause tryptophan to not be converted so much into serotonin, but to be diverted down a different pathway involving something called IDO or indole amine, which converts tryptophan into kynurenine

actually acts as a neurotoxin by way of converting into something called quinolinic acid, which is pro-depressive. Under conditions of inflammation, tryptophan that normally would be made into serotonin is being diverted into a neurotoxic pathway. Ingestion of EPAS limits these inflammatory cytokines, which can cause more of the tryptophan that one ingests or has in their body to be diverted towards the serotonergic pathway that will eventually increase the amount of serotonin.

A second approach is regular exercise. It turns out that it also has a positive effect on the tryptophan to serotonin conversion pathway. In particular, aerobic exercise but also resistance training to some extent tends to sequester neurotoxin and further augments this conversion of tryptophan into serotonin. By getting EPAS from typical food or supplementation and doing regular exercise, we can converge on a common pathway and increase serotonin.



So let's think about WHY this behavioural tool would help you relieve depression. The answer to that is that drugs given to treat the symptoms of major depression, such as SSRIs, SNRIs, and MAO inhibitors increase the amount of noradrenaline, dopamine, and serotonin in the brain. However, tools such as EPAS and exercise are not a replacement for treatment given for depression; rather, they help individuals maintain healthy levels of these hormones in the body, which can make them feel happier and more socially connected.



If you are taking any medication, it is advisable to consult a medical practitioner before implementing these tools.

Summary of the behavioral approaches to conquer depression;

1. Increase the intake of EPAS or essential fatty acids
2. Carrying out regular physical exercises

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SPLASH OF AQUA

Does being around water make you happier?

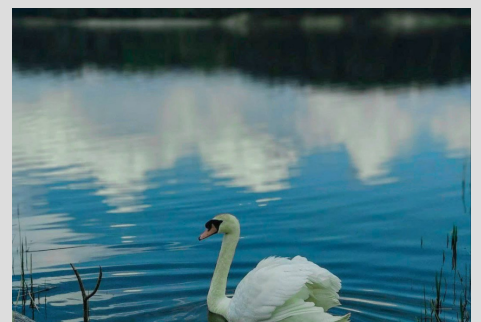
WRITTEN BY
FATHIMATH NAUFA
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Being a Maldivian, you get to grow up immersed in the sea life, surrounded, quite literally, by the ocean. Weekends spent on the beach, burning under the tropical sun, cloud watching while floating away on the glistening crystal blue waters Maldives is famous for. Elder members of the family laughing and catching up a bit too loud. Younger ones coming out of the sea barely long enough to satiate their starving bellies, diving right back in, till the sun sets and the day comes to a way too soon an end. Eid celebrated with vibrant dye colored water splashed on each other, much like Holi, except with water, as is the Maldivian way.

Be it major celebration or just another weekend, water played a major part of every Maldivian's life. So coming from a Maldivian this might be slightly biased, but whether it's a refreshing sea breeze, the gentle crashing of the waves at the shore or the beam of sunshine on the water ripples, I believe there is something deeply healing about being in or around the water.



It is a well-known fact that no living organism on our planet can survive without water. Of course, with the exception of a few such as kangaroo rat which can survive its whole life (10 years!) without drinking water. However, the magic and power the water holds within it might perhaps be more than what we were led to believe. The Victorians prescribed "sea air" as a cure for melancholy, while the French, for centuries, sent people with ailments to natural springs, believing in its restorative properties. Scientists finally seems to be catching up on the healing energy of water.



There are currently several pathways known by which the presence of water may positively impact our health, wellbeing and happiness. While lack of air pollution and increased amount of sunlight experienced in more aquatic environments and the higher general level of physical activity plays a role in this, the main focus of this article is going to be on the psychological restorative effects of water.

A ROOM WITH A BLUE VIEW CAN HELP YOU FEEL LESS “BLUE”.

Though the word ‘blue’ is quite often used to describe feelings of despair, recent research suggests that there are great benefits to being around or near water, also called as “Blue spaces”. For instance, a study published in 2019 in scientific reports found that people who lived near blue spaces had lower risk of mental health issues. “The color blue has been found by an overwhelming amount of people to be associated with feelings of calm and peace. Staring at the ocean actually changes our brain waves’ frequency and puts us into a mild meditative state.”- Richard Shuster, PsyD, clinical psychologist. According to a study published in the American Association for the Advancement of Science’s journal even found that blue is associated with a boost of creativity. In a not so far future we just might need to find another color to describe melancholy.

NEGATIVE IONS PRODUCING POSITIVE VIBES

The smell of the aquatic breeze also contribute to the improved mood, which may have something to do with the negative ions in the air that you breathe in. The oxygen atoms have an extra electron and are naturally created by the water, air, sunlight and the earth’s natural radiation. The highest concentration of these typically occur near crashing water such as waterfalls and the ocean.

Once they reach our bloodstream, negative ions are believed to produce biochemical reactions that increase serotonin levels, helping to alleviate depression, relieve stress, and boost our daytime energy. Negative ions increase the flow of oxygen to the brain; resulting in higher alertness, decreased drowsiness, and more mental energy. A study published in the Journal of Alternative Complementary Medicine suggests that negative ion therapy could be used to treat symptoms of seasonal affective disorder.

1/3rd of our population is sensitive to the effects of negative ions. Negative ions can make them feel like they are walking on air. They feel instantly refreshed the moment they open a window and breathe in fresh, humid air. They also feel sleepy when around an air-conditioner (which is a negative ion eradicator), but feel immediately refreshed and invigorated when step outside or roll down the car window.

Every home has a built in natural ionizer – the shower.

PINK AMBIENCE

The soft sighs of waves washing the shore, the hiss of pebbles being pulled back by the tide, the sounds that water makes in these natural settings fall into the category of “pink noise”. Similar to white noise but smoother and more soothing, pink noise is an ongoing, nondescript sound that equally combines all the sound frequencies a human ear can hear. Studies have discovered that pink noise can help you sleep better as it helps to reduce brain wave activity. Water sounds are naturally soothing and many people have used running water in meditation practices for years.



Researchers believe that the sound of water can guide the neuronal waves in our brain, allowing for a calming effect. However, getting out to the ocean or the lake to wind down at the end of a stressful day isn’t exactly practical for most of us. Whether it is to focus on a task, or relax and sleep better, just playing the sound of water as the ambience can help, even if you just play a video on YouTube. While there is an undoubted need for further research in to the healing abilities of being in and around water, there will be few who would argue against the fact that a bit of sunshine and whole lot of ocean can help lessen the blow of a broken heart or a suffering soul. Everything is just a little bit better, with an ocean breeze and water lapping at your feet.

There is the same amount of water on Earth as there was when the Earth was formed. The water from your faucet could contain molecules that dinosaurs drank!

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THE IMPORTANCE OF CULTURAL COMPETENCE IN BEDSIDE MEDICINE

The highlight of this blog post is to talk about the importance of providing quality, compassionate care at the bedside by physician on respect for a patient's cultural, racial and ethnic background.

WRITTEN BY
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CLASS OF 2025

Why Cultural and Diversity competence Matter in Healthcare?

Cultural Competence is referred to as a collection or a blend of knowledge, attitudes, behaviors and policies that operate together in a structure, system, organization or among professionals to allow successful multicultural work. Culturally competent care means, care that regard to diversity in patient population and society factors that affect health care, such as language, conveying patterns, beliefs, attitudes and efforts. It's important to note that cultural competence, which associate with race and ethnicity, that goes hand-in-hand with diversity competence, which also contemplate disabled people. Being aware of these facts, it plays a major role in providing effective, person centered care. The elements such as race, socioeconomic status and education on health can influence how individuals experience healthcare. These elements can influence how patients recognize symptoms, when and how to look for care, desire for treatment and constancy for medical plans. When medical practitioners or health care workers are culturally competent, they are well equipped to engage with patients and grow trusting relationships which enable a smooth healthcare delivery, advance the patient experience and improve well-being.



How physicians can improve their Cultural Competence?

Although improving cultural competence is a difficult and complex learning process, the foundation for this should be made in medical schools. Such as, engaging in training that boosts intercultural communication skills and responses to cultural differences, studying and engaging with their responses to cultural differences, studying and engaging with their local community, clarifying awareness of their own personal beliefs and culture, which provides a base to strengthen multicultural awareness, implementation of various training programs for Healthcare workers on improving competency based Medical Education.

At present time, there are various programs which are conducted to improve patient-physician communication skills among various ethnic groups, these programs mainly emphasizes the significance of:

- a) Looking for how to understand the patient's narrative,
- b) Attentively hearing to the patient and avoiding discontinuations,
- c) Arranging for appointments by evaluating the patient's setting,
- d) Avoiding dialect that reflects assumptions about splinter groups,
- e) Adapting into expressions, body language and emotional prompts.

Medical colleges should try to educate doctors who can treat patients from variety of socioeconomic and cultural backgrounds. Medical students must acquire skills in how to link successfully with patients from all ages of life, regardless of gender, culture or financial background. Communication skills are linked with clinical competency and the skill to extract, analyze, and interact relevant clinical details to patients in relation to being crucial to physician-patient interactions in terms of patients satisfaction and involvement during the encounter.

Components of Cultural competence in Medicine

It consists of 5 main elements:

- I) **Cultural awareness** implying on expanding the right attitude and giving the best health service to all patients.
- II) **Cultural knowledge** implying looking for information about the culture and beliefs of your patients for better understanding and interaction with them.
- III) **Cultural skills** implying on your ability to gather relevant data and process it , to help attract or engage a patient in consequential cross-cultural interaction.
- IV) **Cultural encounter** - which motivates health care workers to venture out of the environment they are conversant with and try new cultures and places. They enhance their competence by connecting with people from different backgrounds, cultures and ethnicities.
- V) **Cultural desire** - essential a strong motivation to learn more about other cultures. It is a strong force that imply the ability to be open to new people, to gain and understanding cultures that are different from yours, and be prepared to learn.



Examples of cultural competence in Medicine

There are many examples of what a health care provider who exhibits cultural competence looks like. A few key traits include:

- 1) To mention things that are easy for the patients to follow and understand,
- 2) Open minded or disregarding a patient's belief and religious background, but encouraging them to do what works best for them,
- 3) Empathizing with the patient at all times,
- 4) Valuing the individual and applauding strengths and individuality.

Cultural competence is mandatory because without cultural competence, the health sector will experience a great loss and ultimately limit the services that it can offer. A well-built background and knowledge of cultural competence averts professional health caregivers from possessing stereotypes and being myopic in their thoughts. It also helps them provide the best service to all, regardless of their social status or belief. Healthcare work can strengthen their cultural competence by continuing education, cross-cultural interactions.



These efforts lend a hand to keep their minds open and free of judgement or accomplished notions about certain cultures. The world becomes better with more culturally competent service providers in each sector. Culturally competent health care providers are required to provide top quality services to their patients-transforming to better health care in every community.

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