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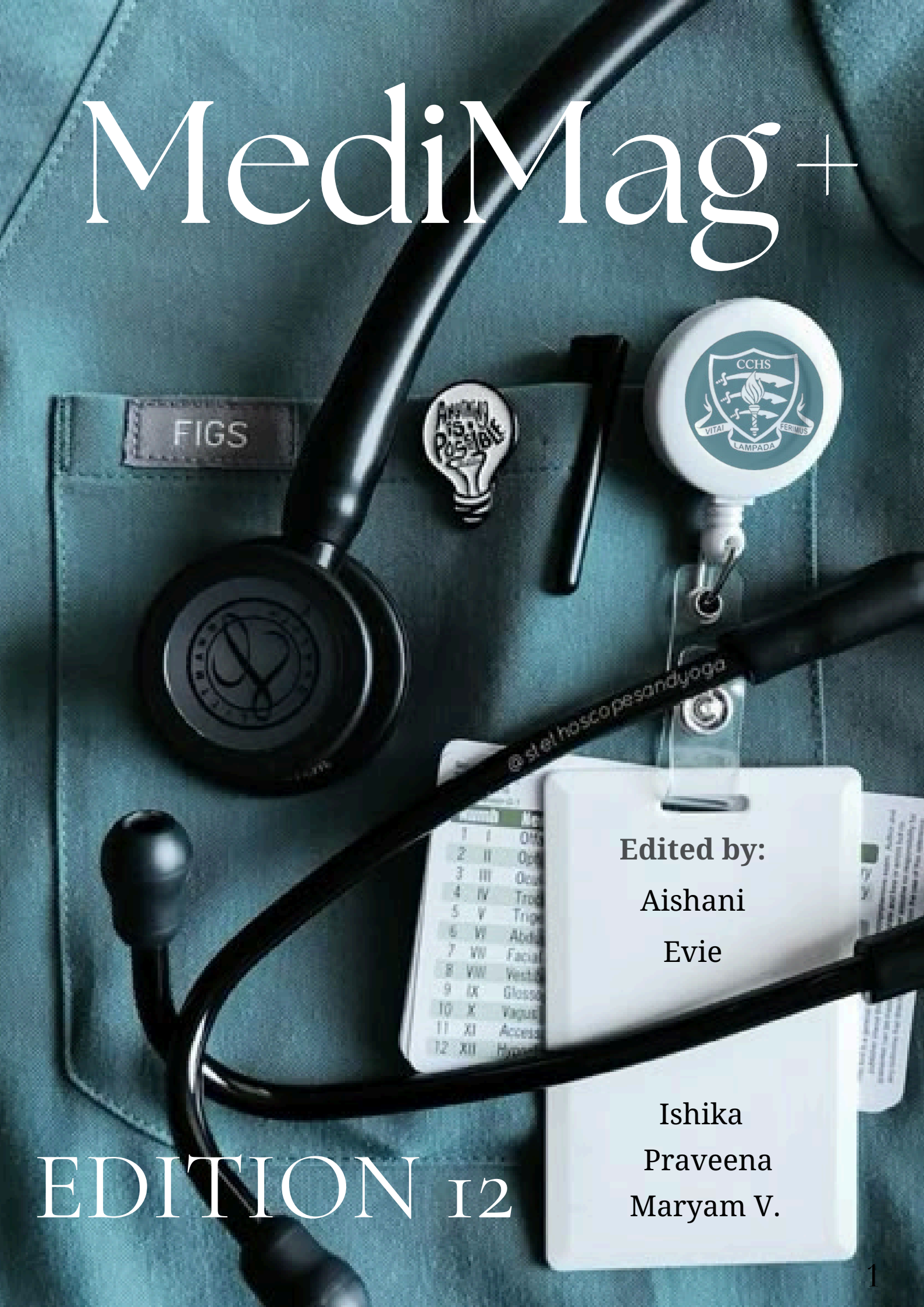

Edited by:

Aishani

Evie

Ishika

Praveena

Maryam V.

EDITION 12

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General Medicine and Health

Healthcare inequality in the UK

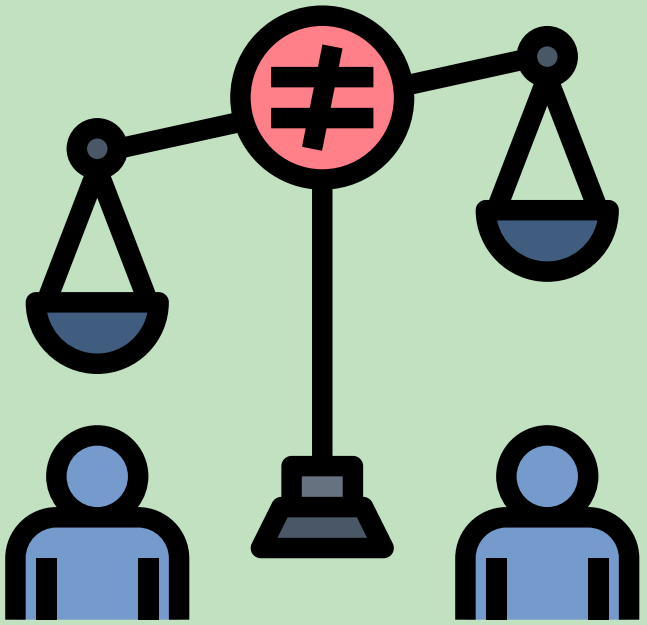
Inequalities in health by social class have been documented for over a century, while the topic of impacts of structural racism on health has more recently become a clearly defined field of study. These main factors have been proven to vary the health outcomes of certain demographics, as well as the access and quality of healthcare across the UK. These have been recognised to a certain degree, however programmes and schemes to combat these issues require sufficient action from various healthcare services to transform inequitable health outcomes.

Class

Prevalence of Disease

Class and wealth levels are significant aspects of the prevalence of disease and infection, particularly non- communicable disease. The treatment of non-communicable diseases such as coronary heart disease may also be affected by area and the level of publicity around certain health issues and factors influencing them.
Coronary heart disease (CHD) or ischaemic heart disease is usually caused by a build-up of fatty deposits (atheroma) on the walls of the arteries around the heart (coronary arteries). The build up of atheroma makes the walls of the arteries narrower, restricting the flow of blood to the heart muscle. This process is called atherosclerosis. CHD affects approximately 2.3 million in the UK,and has previously been considered the UK's biggest killer.

Varying prevalence of CHD across the UK is mainly due to a difference in the levels of exogenous factors such as smoking, diet, a lack of exercise, and stress (external or non-genetic factors). In particular, a high fat diet often leads to fatty material being built up in arteries and can also lead to increased risk of high blood pressure, high cholesterol, and type 2 diabetes. The purchasing of 'healthier' lower fat alternatives which tend to be more expensive and popular in more affluent areas and can be influenced by average household income, occupation, and qualification levels- leading to a clear divide in the types of individuals able to access these foods. This is often supported by data demonstrating the difference in CHD number between the north and south of the UK.
Age standardised incidence rates over a 15-year period tended to follow the pattern of higher rates in Scottish and Northern English towns and lower rates in Southern English towns (supporting the concept of a North-South divide). Glasgow City, Scotland has the highest death rate from CHD- 136.6 deaths per 100,000 people under 75 and remains the most deprived city and local authority area in Scotland.



Recent increases in the cost of living had also led to a significant increase in the consumption of ultra processed foods, particularly in low-income areas or households from low socio-economic backgrounds. These can include crisps, biscuits, carbonated drinks, and some alcoholic drinks including rum and whiskey which hold high levels of saturated fat, salt, and sugar. The consumption of ultra processed food is a significant risk factor for the development of CHD and other cardiovascular diseases, highlighting the difficulty millions of households face in limiting their risk of disease as over 13 million people were reported to be living in poverty as of March 2026.

Many households, particularly from low socio-economic backgrounds, have also been termed ‘time-poor’– describing the situation of lacking discretionary (free) time, as opposed to lacking money or resources as in economic poverty. This primarily affects lower- skilled or lower income workers who are likely to have less control over their hours. This can influence exercise levels- thus having an impact on physical health and the risk of developing CHD, but can also limit individuals' ability to prepare lower fat alternatives and include more nutrients (such as fibre from fruit and vegetables) in their diet, which is effective in reducing the risk of developing CHD.

Overall, CHD disproportionately affects the lower class due to exogenous factors that are often out of their control and have been proven to vary the outcomes of certain areas. Regional disparities have caused uneven health outcomes.

<u>What can be Done?</u>

The NHS Long Term Plan’s key aim was to tackle health inequalities through better engagement with those least likely to present NHS services now. The plan included five key areas:

- Restoring the NHS services inclusively
- Mitigation against digital exclusion
- Ensuring datasets are complete and timely
- Acceleration preventative programmes
- Strengthening leadership and accountability

This aims to provide exceptional quality healthcare to all, ensuring equitable access and optimal outcomes. However tackling inequalities and improving healthcare for everyone requires consistent and coherent focus of population health at a local, regional, and national level, as well as targeted action to support change.

Delivering this requires collective action from many systems and organisations - including the NHS- but is believed to have economic as well as social benefits: a more equitable NHS like likely be more efficient. Publicity and education of areas around certain, avoidable risk factors (smoking, exercise etc.) can be key to lowering prevalence and death rates of non communicable diseases, however it can be argued that these cannot fully be mitigated while there is a presence of poverty and disparities, due to factors outside individuals' control.

Race and Ethnic Background

Stereotypes and Prevalence of Disease

Racial inequalities are also believed to play a role in the quality of healthcare received by certain minority groups. Prior evidence has shown that structural racism leads to people from minority backgrounds having poorer health outcomes. For example, black women in the UK are around 3-4 times more likely to die during pregnancy or childbirth than white women according to MBRRACE- UK. Additionally, Type 2 diabetes and other conditions are significantly more common in Asian and Black populations.

Miss Bibi syndrome is a term that stems from the common South Asian surname and implies that south Asian women (usually older women) tend to exaggerate their symptoms, demonstrating racial bias towards south Asians in the healthcare system. It implies that their healthcare concerns are less clinically credible. Deeply rooted in racist- as well as sexist- stereotypes, this is detrimental to the health and wellbeing of south Asian women and often leads to delayed diagnoses with significant consequences on south Asian health.

Studies have shown that type 2 diabetes is more prevalent in South Asian populations, however diagnoses is still often delayed due to this stigma. The increasing prevalence of diabetes in south Asians in multifactorial but may be believed to take into account the injustices within the healthcare system of the UK. This can also be true for concerns of mothers regarding their infants, evident by the infant mortality rate of Asian infants being 5.7 (per 1000) compared to 3.1 for white infants.

Furthermore, the impact of COVID-19 on ethnic minority healthcare workers acts as further confirmation for the impacts of structural racism. Within the healthcare workforce, a shocking 85% of doctors who dies from COVID-19 were from ethnic minority backgrounds, which is unlikely to have resulted solely from socioeconomic factors. Surveys from the BMA during the pandemic found that doctors from ethnic minority backgrounds were more likely to feel pressured to work without adequate PPE and were more afraid to speak out about safety concerns for fear of discrimination, or it affecting their careers. This highlights that racial discrimination present within healthcare systems, which may further push stereotypes onto specific racial groups-limiting equality.

What can be done?

Education and publicity are believed to be key to breaking down stereotypes and prejudice. And increasing number of places have now tried to enforce that healthcare professionals should be trained in cultural competence, and it is slowly filtering into medical schools. As well as this, the NHS had for ally recognised the existence of racial and ethnic inequalities and has introduced a range of measures to try and combat this. For example, national investigations, data monitoring, staff training programmes, and policy initiatives. This aims to make ethnic minorities feel more secure about the quality of their healthcare and treatment and improve healthcare outcomes for a various populations.

To conclude, it is deeply unjust that some groups of people have worse health outcomes than others as a result of unavoidable factors such as face and ethnic backgrounds. A change in the mindsets of many healthcare systems or even specific healthcare professionals is required to transform these outcomes, ensuring that all groups of people are equally examined and treated without fear of dismissal or rejection.

Jazmyn 12RTH

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The Science of Recovery: Why rest is essential for peak athletic performance

When people think about improving athletic performance, they often picture intense training sessions, hours in the gym, or pushing through exhaustion. However, one of the most important aspects of becoming a stronger, faster, and healthier athlete happens after the workout is over. Recovery is not simply taking a break, it is a scientifically proven process that allows the body to repair, adapt, and perform at its best.

Exercise places stress on the body. During high-intensity training, tiny tears develop in muscle fibres, energy stores become depleted, and hormones such as adrenaline and cortisol increase. While this stress is necessary for improving fitness, the body only becomes stronger when it has enough time to recover.

Recovery is when damaged muscle fibres are repaired, energy stores such as glycogen are replenished, and the cardiovascular and nervous systems return to normal. This process, known as adaptation, is the reason athletes improve over time.

Without sufficient recovery, the body cannot repair itself effectively. This can lead to persistent fatigue, reduced performance, and a greater risk of injury. Over time, inadequate recovery may result in overtraining syndrome, a condition characterised by prolonged tiredness, poor athletic performance, increased susceptibility to illness, and even mental health challenges such as low mood and reduced motivation.

Sports scientists now recognise that recovery is just as important as training itself. Elite athletes carefully plan recovery into their schedules because they understand that rest is essential for long-term success.

The Four Pillars of Recovery:

1. Sleep

Sleep is often considered the most powerful recovery tool available. During deep sleep, the body releases growth hormone, which stimulates tissue repair and muscle growth. Research has also shown that adequate sleep improves reaction time, concentration, memory, and decision-making, all crucial skills for athletic performance.

Teenagers should aim for approximately 8-10 hours of sleep each night, particularly during periods of intense physical activity.

2. Nutrition

Recovery begins with replacing what the body has used during exercise. Carbohydrates restore glycogen stores, while protein provides the amino acids needed to repair muscle tissue. Healthy fats, vitamins, and minerals also play important roles in reducing inflammation and supporting immune function.

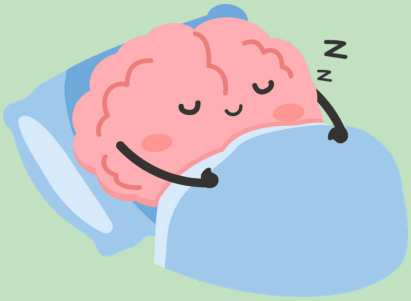
Hydration is equally important. Even mild dehydration can negatively affect physical and mental performance, making adequate fluid intake essential before, during, and after exercise.

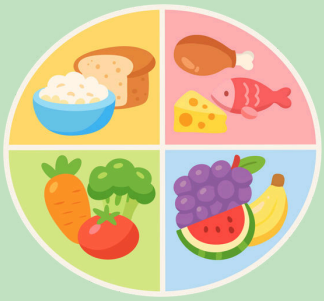
3. Active Recovery

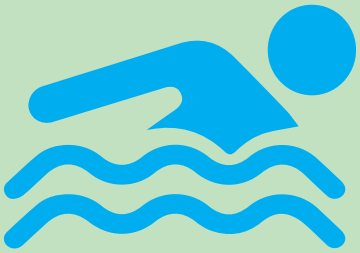
Recovery does not always mean complete rest. Light activities such as walking, swimming, cycling, or stretching can increase blood flow to muscles, helping remove waste products while delivering oxygen and nutrients needed for repair. Many athletes use active recovery on days between intense training sessions to reduce muscle soreness without placing additional stress on the body.

4. Mental Recovery

Athletic performance depends not only on physical fitness but also on mental wellbeing. Academic pressures, competitions, and everyday stress can increase fatigue and slow recovery. Techniques such as mindfulness, breathing exercises, spending time outdoors, and maintaining a healthy work-life balance can all support psychological recovery and improve overall performance.



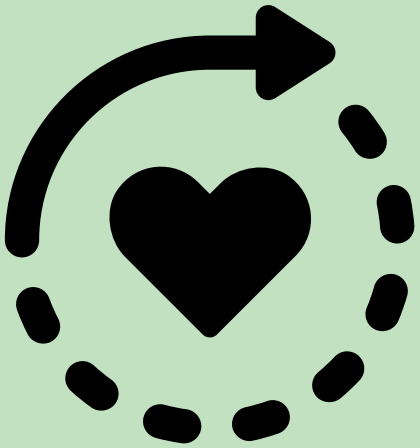




The Future of Recovery:

Modern sports science continues to develop innovative methods for monitoring recovery. Elite teams now use wearable technology to track heart rate variability, sleep quality, and training load. These data help coaches determine when an athlete is ready to train and when additional recovery is needed, reducing the risk of injury while maximising performance.

Recovery methods such as cold-water immersion, compression garments, and massage are also widely used, although research suggests that their effectiveness varies depending on the athlete and the type of exercise performed.



Conclusion

Recovery is not a sign of weakness or laziness, it is a basic part of athletic success. Exercise creates the stimulus for improvement, but recovery is when the body adapts and becomes stronger. Whether you are an elite athlete or simply enjoy staying active, prioritising sleep, nutrition, hydration, active recovery, and mental wellbeing can improve performance while protecting long-term health.

In sports science, one message is clear: training makes you tired, but recovery makes you better.

Aishani 12JOR

The challenges of diagnosing illness in children

A toddler throws a violent tantrum in a supermarket. A child cannot sit still in class. A teenager becomes withdrawn and refuses to speak to friends. In adults, sudden behavioural changes often suggest illness, yet in children these would likely be dismissed as bad behaviour or poor parenting. So how do we tell whether these symptoms reflect disease, stress, or are simply a normal part of the child's development?

Diagnosing illness often begins with a conversation. Doctors ask patients to describe their symptoms, explain when they started, and identify what feels different. In paediatrics this process isn't as simple; young children may not understand what they are feeling, lack the language to describe it, or rely on a third party such as their parents to explain for them. As a result, the symptoms described can often be vague and non specific. For example, anxiety can present as stomach aches, headaches, or refusal to go to school, while a child with appendicitis may simply complain of feeling unwell.

These difficulties become even more complex in psychiatry, where diagnoses are based mostly on observed behaviour and clinical judgement rather than objective tests. Psychiatric diagnoses in children can sometimes be uncertain and inconsistent, as there is a lack of consensus in the medical community about what behaviours constitute a particular disorder. In 2008, an article in the New York Times Magazine reported a story of a little boy whose behaviour was interpreted differently over time, first as ODD (oppositional defiant disorder), then ADHD, and then bipolar disorder. Because the diagnosis kept changing, so did the treatments, and by the age of nine, he had already been prescribed several very strong medications. Despite all these medications, his condition did not improve.

However, the struggle of diagnosing children is not limited to psychiatry, as shown by two case studies:

Case study 1: Daniel Klosi

In 2024, an inquest found that four year old Daniel Klosi, who was autistic, died from sepsis after being taken to the Royal Free Hospital four times within a single week. The coroner ruled that doctors failed to recognise his symptoms potentially because of his autism, meaning he couldn't vocalise the specific severity of his illness.

Despite having a high fever and extreme drowsiness, he was repeatedly sent home and advised to take paracetamol, as the doctors believed he had a simple viral infection. A simple blood test would have identified the need for antibiotics, but it was never ordered. Daniel died shortly after his fourth hospital visit.

Case study 2: Dylan Cope
Nine year old Dylan Cope died in 2022 after his appendicitis was misdiagnosed as a common cold. While nine year olds can speak, appendicitis in children often presents with atypical symptoms like general stomach pain compared to the classic localised pain that adults describe. Dylan was discharged from the Grange University Hospital with a "coughs and colds" advice sheet. His appendix perforated, leading to septic shock and multi-organ failure. He died eight days later. The hospital later admitted his death was "preventable."

These are two of many more similar fatal incidences, where communication barriers and atypical symptom presentation can contribute to missed diagnoses. This concern was a main reason behind the introduction of Martha's rule in 2024, following the death of thirteen year old Martha Mills from sepsis after doctors ignored her parents' warnings. Because Martha was a child, she couldn't explain the scary symptoms she was feeling, and her parents were essentially "silenced" by the medical team. Martha's rule allows families to request an urgent second opinion from a different team of specialists right away, if they feel their concerns are not being properly addressed.

Doctors are required to treat parents as experts in their children, helping to ensure that a child's inability to speak for themselves doesn't lead to a fatal mistake. As of May 2026, the initiative has been implemented across all 210 acute inpatient sites in England and is reported to have already saved more than 500 lives.

Yet despite the dangers of missed diagnoses, there are also concerns that society has now become too quick with labelling "out of the norm" traits, and that a child repeatedly being described through a language of disorder may start to think that there is something inherently wrong with them. However, avoiding diagnosis altogether is also harmful, as many children with conditions such as autism or ADHD struggle for years without support, leading to low self esteem, and difficulties in education and relationships.

Ultimately, diagnosing children is challenging because symptoms vary widely and can't often be clearly expressed or measured. This difficulty is seen in both physical and psychiatric conditions, where doctors often have to rely on interpretation over concrete evidence. This highlights that in children, good medical care depends not only on reaching a clear diagnosis, but also on careful judgement in uncertain situations.

Momina 12RTH

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How ethical is disability screening?

In 2002, a couple in the US caught media attention for deliberately choosing to have a deaf baby using IVF, stating that “A hearing baby would be a blessing. A deaf baby would be a special blessing”. Whereasin the UK, a law was passed in 1990 against PGT (Preimplantation Genetic Testing) screening to select a disabled embryo when non-disabled embryo is available. But why is the converse not possible, and what are the ethical justifications for the argument that screening tests should be allowed to determinecharacteristics of an embryo?

What is disability screening?

Disability screening services have been implemented since 1968, when Chorionic Villus Sampling (CVS) was first tested on a woman. This an invasive method of screening where a small sample of cells from the placenta are removed a tested, which has a risk of miscarriage if carried out, making it generally not offered to women unless there is have a high chance that the baby could have a genetic or chromosomal condition.

However, the invention of NIPT (non-invasive prenatal testing) made this process substantially easier as itallows for pregnant people to test their blood for fragments of the child’s DNA (known as ‘cell free DNA’)to see if they may be likely to develop Down’s, Edwards’ and Patau’s syndromes, which are caused by most or all of a person’s cells containing an unusual number of chromosomes, also known as ‘Aneuploidy’. This made it more readily offered to pregnant people and has become a standard part of routine in antenatal care.

Why does it matter?

For those with Down’s syndrome, this decision to include screening as a standard part of procedure can be seen as offensive because it stigmatises Down’s syndrome further, sparking the movement “Don't Screen Us Out” which reinforces the idea that there shouldn’t be a need to see if a baby has Down’s because it doesn’t detract from a child’s ability to live a rich and fulfilling life.

Screening however ensures sufficient patient autonomy and could be regarded as ethically justifiable as long as the Down’s community is respected in its usage, because it provides the pregnant person with more information about the baby and their next steps.

What is patient autonomy?
A key concept that can be considered the most important principle in medicine is the respect for individual autonomy, but what does that actually mean? For "sufficient autonomy" to be evolved, the patient must be provided with enough evidence about a treatment/service to come to a conclusion on their own, to allow for a full understanding of the implications of their actions, and without coercion from a third party.

This means that if an individual's choices are deemed to be "not authentic" due to having been misinformed by social media, or because someone seems to be pushing this decision for them a doctorshould try and provide enough support for the patient so that sufficient autonomy can be guaranteed. However, patient autonomy can be overridden if a patient lacks mental capacity to make their own decisions, or if the treatment would have a greater "overall benefit" for the patient, which is an intensive decision-making process consulting many bodies and the relatives of the patients, and this is usually a last resort as care is always centred around the patient and their wishes.

With disability screening, a pregnant person may want to screen their child to see if they have a disability so that they can be better informed about how to care for a child and what to expect so that they may support the child further in their developmental journey, and offering this service can be seen as ethically acceptable because this constitutes providing the patient with all the available information for them to make an informed choice about their following journey. Equally, the doctor must ensure a safe environment for the pregnant person so that they do not feel pressured to make this decision for this to truly further patient autonomy.

The clash between autonomy and preventing harm
Autonomy can also be overridden if it prevents further harm to the patient or to others in cases such as emergencies, where resuscitation may be given to a patient despite not knowing whether they would consent to this.
The law passed against PGT was put into place because it reduces harm to the child's future welfare, which has been deemed more important than the parent's wishes in this case due to the lifelong implications of the parent's decision if a child with severe medical issues is selected for willingly by a parent. The line between preventing harm and ensuring autonomy is a fine one, with both sides having arguments that make them ethically sound in this situation.

What considerations must be in place?
To ensure that the use of NIPT in screening for disabilities is ethically justifiable, it should be offered to the parent with no obligation to take it or further pressure if the result is positive, and this means that if it is offered in a 'standard routine', it should be mentioned as an option to discuss and dwell on rather than a decision with much pre-warning.

Aishika 12JBR

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Technology In Medicine

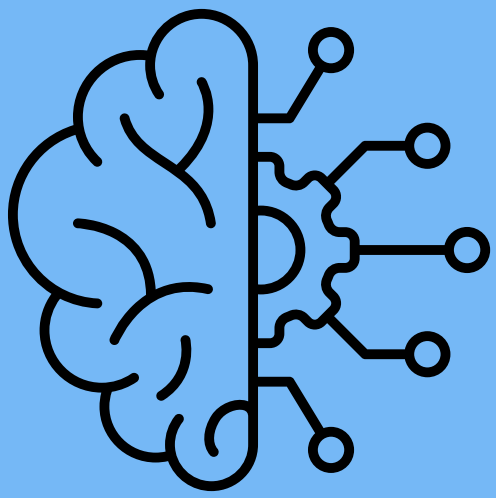
THE USE OF AI AND MENTAL HEALTH APPS

In recent years, mental health support has increasingly been delivered through digital platforms and AI-powered applications. Although these technologies offer easily accessible and immediate forms of engagement with mental wellbeing, their growing prominence has prompted critical debate regarding the potential dehumanisation of care, as well as concerns about the medicalisation of normal emotional experiences. Is this integration of artificial intelligence in healthcare really worth these concerns?

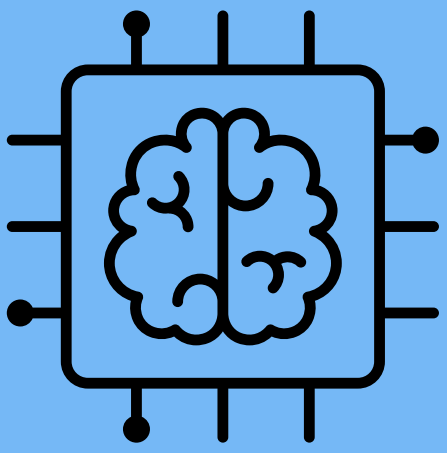
The most significant concern surrounding AI-driven mental health care is the potential dehumanisation of therapeutic relationships, particularly through the lack of genuine human empathy. In addition, traditional care relies on what many describe as a deeply emotional process, where understanding is shaped through shared emotional experience, non-verbal cues, and trust that is built over time: elements that AI systems struggle to replicate. While tools such as Woebot can simulate empathetic dialogue, research suggests this “empathy” is ultimately part of an algorithm rather than truly authentic. Recently, an ethical review of generative AI in the field of psychiatry highlighted concerns that systems such as these may replicate supportive, empathetic language without actually understanding, raising questions about the quality and depth of the care provided.

Similarly, a 2025 systematic review in BMC pyschiatry emphasised that although AI can improve access and engagement, its implementation must address significant ethical challenges, including the loss of human interaction and connection. support.

Broader debates in medical ethics also warn that fears of “dehumanisation” stem from the risk that clinical decision-making and patient interaction become increasingly mediated by algorithms rather than throug personal understanding and communication. Taken together, these perspectives suggest that while AI may enhance efficiency and accessibility, it risks reducing care to standardised responses, potentially weakening the personal connection that is widely considered central to effective mental health



Another concern surrounding AI-driven mental health technologies is their role in the medicalisation of average emotional experiences. For example, emotional states such as stress, sadness or anxiety which are part of ordinary human life are interpreted through a clinical lens because of the design of these many digital tools. Further research into digital psychiatry has highlighted how symptom checking algorithms and mood tracking features can inadvertently pathologies everyday feelings, framing them as indicators of a mental health disorder rather than just a natural response to life experiences. In addition, a recent article in BMC Psychiatry noted that while these technologies can support early identification of mental health issues, they also risk lowering the threshold at which distress can be classified as a serious problen. Similarly, others argue argue that the expansion of diagnostic frameworks through ai combined with constant self-monitoring may promote an overly medicalised understanding of wellbeing. This is further reinforced by the structured, symptom focused interactions seen in apps like Woebot, which prioritises categorisation over understanding.



In summation, while AI mental health tools are able to offer useful support to an extent, they risk dehumanising care by reducing emotions to just simplified data and may also contribute to the medicalisation of a normal human experience by framing everyday feelings as something clinical significant. This means that they should be used carefully alongside, as opposed to replacing, genuine human understanding.

Deetya 8G

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The Technology Behind Early Disease Detection

Most serious diseases do not appear suddenly. Long before symptoms become obvious, changes are already happening inside the body at a cellular or molecular level. The challenge for medicine has always been finding these changes early enough to make a difference. Today, advances in technology are transforming that goal from an ideal into reality.

Early disease detection is one of the most powerful tools in modern healthcare because it often means simpler treatments, better outcomes, and higher survival rates. In conditions such as cancer, heart disease, and neurological disorders, detecting illness before it progresses can completely change a patient's prognosis.

One of the most significant developments in this field is the rise of medical imaging technology. Tools such as MRI, CT, and PET scans allow doctors to see inside the body without surgery. These imaging methods have become increasingly detailed over time, with modern scanners capable of identifying tiny abnormalities that would have been invisible decades ago. For example, low-dose CT screening is now used in some countries to detect lung cancer in high-risk patients before symptoms appear.

Alongside imaging, artificial intelligence is rapidly changing how doctors interpret medical data. AI systems trained on thousands of scans can now help identify early signs of diseases such as breast cancer, skin cancer, and even eye conditions like diabetic retinopathy. Rather than replacing doctors, these systems act as a second set of eyes, highlighting subtle patterns that might otherwise be missed. In some studies, AI has matched or even exceeded human accuracy in specific diagnostic tasks, particularly in radiology and dermatology.

Another breakthrough comes from the field of blood-based testing, often referred to as liquid biopsy. Instead of relying on tissue samples taken through surgery, liquid biopsies detect fragments of DNA shed by tumours into the bloodstream. This allows doctors to identify cancer at very early stages and even monitor how it changes over time. Research is ongoing into multi-cancer early detection tests that could screen for several types of cancer using a single blood sample, which could revolutionise routine screening in the future.

Beyond cancer, wearable technology is also playing a growing role in early detection. Devices such as smartwatches and fitness trackers continuously monitor heart rate, oxygen levels, and electrical activity in the heart. These devices have already been shown to detect irregular heart rhythms such as atrial fibrillation, sometimes before patients are aware of any problem. In this way, everyday technology is becoming a silent health monitor.

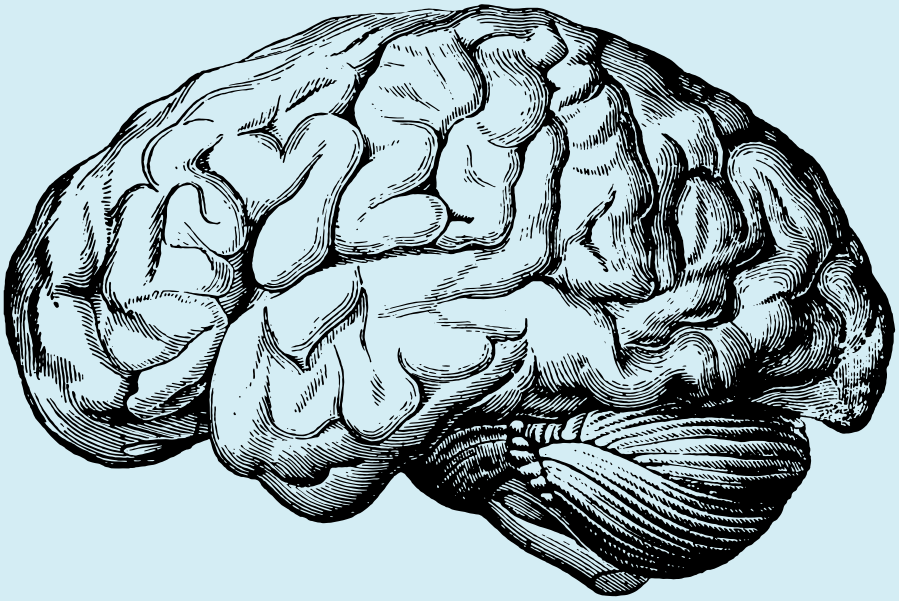
Genetics is another area driving progress. By analysing a person's DNA, scientists can identify inherited risks for conditions such as breast cancer, Alzheimer's disease, and certain heart conditions. This allows for personalised screening programmes, where individuals at higher risk are monitored more closely and earlier than the general population. Medicine is gradually shifting from a one size fits all approach to one that is tailored to each individual.

Despite these advances, early detection is not without challenges. One major issue is false positives, where a test incorrectly suggests a disease is present. This can lead to unnecessary stress, further testing, and sometimes invasive procedures. There is also the question of access, as advanced diagnostic technologies are not equally available across all healthcare systems.

Ethical concerns also arise when predicting disease before symptoms appear. If a person knows they are at high risk of developing a serious condition in the future, it can affect their mental health, insurance status, and life decisions. Balancing the benefits of early knowledge with the psychological and social impact is an ongoing debate in medicine.
Even with these challenges, the direction of travel is clear. Medicine is moving from treating disease to predicting and preventing it. The combination of imaging, artificial intelligence, genetics, and wearable technology is creating a healthcare system where diseases are detected earlier, treated more effectively, and sometimes even prevented altogether.
In the future, a routine check-up may not just tell you how healthy you are today, but what illnesses your body might be developing long before you ever feel unwell. That shift could redefine what it means to be a patient in modern medicine.

Anna 12RHA

Psychology



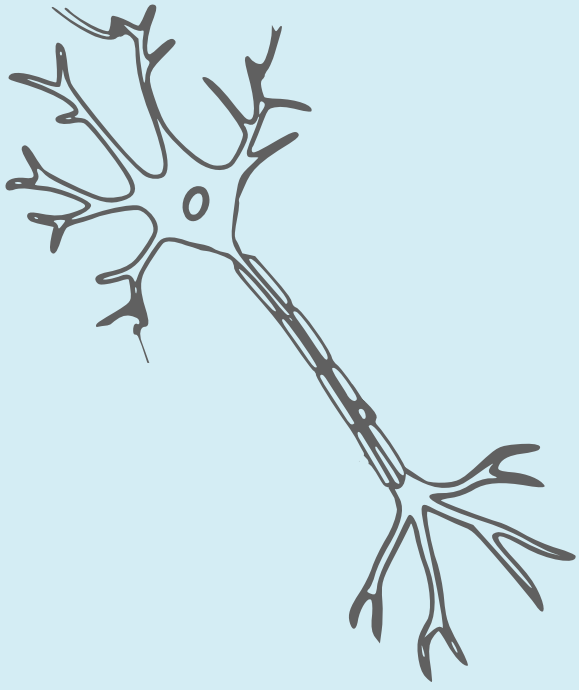
GUT-BRAIN AXIS

The Gut-Brain Axis: Biology's Hidden Conversation

The human brain is often viewed as the body's sole command centre, but a complex network within the digestive tract suggests otherwise. It is known as the "Second Brain," and this intricate system communicates directly with the brain through a constant biological dialogue.

The Vagus Nerve: The Communication Highway

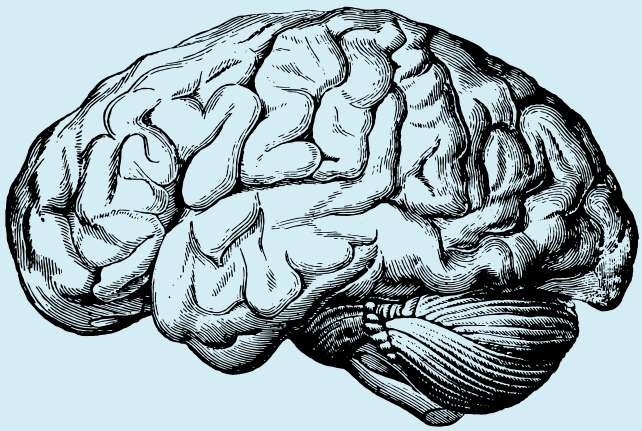
The physical backbone of this connection is the Vagus Nerve. This nerve acts as a high-speed messaging system between the gut and the Central Nervous System. It can be seen as a two-way street; while the brain sends signals to the gut, the gut also sends distress signals back to the brain. When the gastrointestinal system becomes irritated, it can trigger a shift in the CNS, leading to noticeable changes in mood and mental state such as heightened anxiety.



The Microbiome and the Blood-Brain Barrier

Within the gut lies a massive ecosystem called the microbiome, consisting of trillions of bacteria, viruses, and fungi. These microbes do more than digest food; they are essential for brain protection.

- SCFAs: Specific bacteria produce Short-Chain Fatty Acids (SCFAs).
- Protection: These SCFAs have anti-inflammatory properties and help strengthen the blood-brain barrier
- Defence: A strong barrier is selectively permeable, meaning it allows nutrients in while preventing harmful bacteria and toxins from entering the brain—a process crucial for preventing neurological disorders.



GABA: Nature's Neural Stabilizer

The gut-brain axis also involves GABA, the body’s primary inhibitory neurotransmitter. GABA’s job is to reduce "neuronal excitability," essentially acting as a stabilizer for the nervous system to promote calmness.

The chemistry is fascinating: when GABA binds to receptors on neurons, it allows Chloride ions to enter the cell. This influx of ions stabilizes the membrane potential, which prevents the brain from becoming overstimulated.

Clinical Findings: The Vink et al. Study

- The power of this connection was demonstrated in a study by Vink et al., which focused on 39 patients dealing with chronic fatigue and severe anxiety. The group was split: half received a specific bacterial strain, while the other half received a placebo. After two months, those who received the bacterial strain showed a significant decrease in anxiety whereas the placebo group saw no change.

The Impact of Modern Diet

Despite the importance of this axis, it is easily disrupted. A diet high in refined carbohydrates and fats offers no fibre and virtually no nutritional value for the microbiome. Without fibre, the "good" bacteria cannot produce the SCFAs or neurotransmitters like GABA that the brain relies on. In short, poor gut health doesn't just affect digestion it can directly compromise neurological health and emotional stability.

Ishika 12JBR

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The clinical applications of recreational drugs

Recreational drugs are substances that are usually taken for pleasure. They are renowned for their ability to alter consciousness, mood and even perception, promoting many people worldwide to use them as a tool to escape from reality.
Controlled substances are classified functionally based on how they affect the central nervous system (CNS), whether this be cognitively, soothingly or as an energy booster. The main three types of these controlled substances are stimulants, depressants and hallucinogens; however, the properties of some of these drugs are so multi-faceted and are only just being discovered that it is sometimes difficult to place them into 3 strict categories.

Depressants
As the name suggests, depressants are medications that slow down processes in the body, specifically ones that contribute towards the overactivity of the CNS. In this way, a sedative effect can be achieved.
Generalised Anxiety Disorder can cause excessive worry and muscle tension that a patient may find interferes with their everyday life. Benzodiazepines are depressants that enhance the activity of a neurotransmitter called GABA. GABA opens chloride ion channels upon binding to GABA receptors that prevent the post-synaptic neurone from being excessively stimulated by other neurotransmitters. This in turn brings about a calming effect and can help to relieve a patient's persistent anxiety.

Despite their ability to inhibit intense emotional responses, depressants are a stellar example of why dosage control is hugely important. In low doses they cause relaxation and mild drowsiness, however in high doses an individual can experience a significant loss of coordination and even respiratory failure. Alcohol, a commonly known depressant, exemplifies how strictly the medical application of depressants should be controlled.

Hallucinogens
Considering that pain can often accompany affective disorders such as major depressive disorder, an interest into the research of hallucinogens (or psychedelics) as medications has increased.
Hallucinogens such as lysergic acid diethylamide (LSD) have been found to have analgesic properties (Kast and Collins (1964)) that are much superior to those of non-controlled substances. Analgesic effects refer to the ability of a substance to reduce pain without affecting consciousness. LSD works by mimicking serotonin, stimulating the growth of new neural connections in a process called synaptogenesis. This helps to challenge the maladaptive circuits that maintain major depressive disorder and its associated pain.
An advantage of the LSD hallucinogenic is the fact that the long-term risks of depressants such as physical withdrawal symptoms and liver failure are not usually shown by those taking LSD. Rather, LSD and hallucinogenic-related deaths are due to impaired awareness that can lead to poor judgement and decision-making.

Empathogens

Methylenedioxymethamphetamine (MDMA) is a substance that causes an increased sense of euphoria and energy. Whilst it is widely recognised as a stimulant, it has also become involved in treating PTSD due to its empathogenic-entactogenic properties. In psychotherapy, a patient must face the realities of their trauma to change their thinking patterns. As this requires a high emotional tolerance, the administration of MDMA can allow the patient to confront these unpleasant memories without the fear response that is associated with them.

The empathogenic properties of MDMA can result in enhanced empathy towards other people. In a therapeutic context, this may increase the willingness of a patient to disclose emotional content that pertains to their trauma to their therapist. The entactogenic properties of the drug allow for a higher level of introspection and self-understanding. This can reopen something called the social reward learning critical period; a developmental period in which the brain is sensitive to social stimuli. This in turn allows for more cognitive flexibility on behalf of the patient to unlearn the distorted beliefs that were a product of their traumatic experiences and to also promote the learning of productive beliefs.

Conclusion

Knowing these useful applications now, it is clear that recreational substances could have many potential clinical uses far into the future if they are properly controlled and monitored. One such example is that patients who experience inadequate relief from traditional analgesics could be prescribed hallucinogens, but this should only be done after further research has been conducted.

Overall, the addictive potential of controlled substances does not negate their medicinal value. The transition of these substances from being used as catalysts for abuse to new breakthrough medicines is an important progression to recognise and to take subsequent advantage of.

Evie 12KRE

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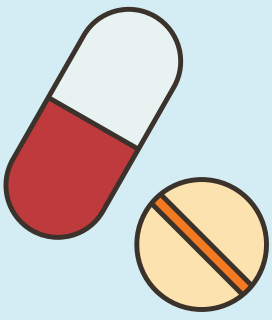


The Ethical Debate around Memory Erasing Treatments

If you could erase the emotional pain of your worst memory, would you?
It sounds like the plot of a science fiction film, but scientists are already exploring ways to reduce the impact of traumatic memories. Although true "memory erasure" is still beyond our reach, researchers have developed treatments that may weaken the emotional intensity attached to painful memories. For people suffering from post-traumatic stress disorder (PTSD), this could be life-changing. However, these developments have sparked an important ethical debate: should we alter our memories, even when they cause suffering?

One of the most widely studied approaches involves a drug called propranolol. Originally developed to treat high blood pressure, propranolol can affect the way emotional memories are processed. When a patient recalls a traumatic event while under the influence of the drug, the memory may be "reconsolidated" with a reduced emotional response. The person still remembers what happened, but the memory may no longer trigger the same level of fear or distress.

Researchers have investigated whether this technique could help people with PTSD. In a 2018 clinical trial, patients who received propranolol before revisiting traumatic memories experienced a greater reduction in PTSD symptoms compared with those who received a placebo. The findings suggested that targeting the emotional component of memories could offer a promising new treatment for trauma.
Despite these potential benefits, many ethicists are cautious. Memories, even painful ones, help shape our identity. Our experiences influence our values, decisions, and relationships. If a significant memory is altered, does that change who we are as people? Some philosophers argue that painful memories are part of the story of our lives and that removing their emotional impact could affect our understanding of ourselves.
Others worry about where the line should be drawn. Most people would agree that helping a war veteran overcome debilitating PTSD is a worthwhile goal. But what if similar treatments were used for less serious experiences, such as the embarrassment of a failed exam or the sadness of a breakup? Critics have raised concerns that society could begin to medicalise normal human emotions rather than learning to cope with them.

There are also legal and social questions. Memories can play an important role in criminal investigations and eyewitness testimony. Some have questioned whether memory-modifying treatments could interfere with a person's ability to provide evidence or remember important events accurately. Although researchers believe these concerns are often exaggerated, they highlight the broader implications of altering memory.

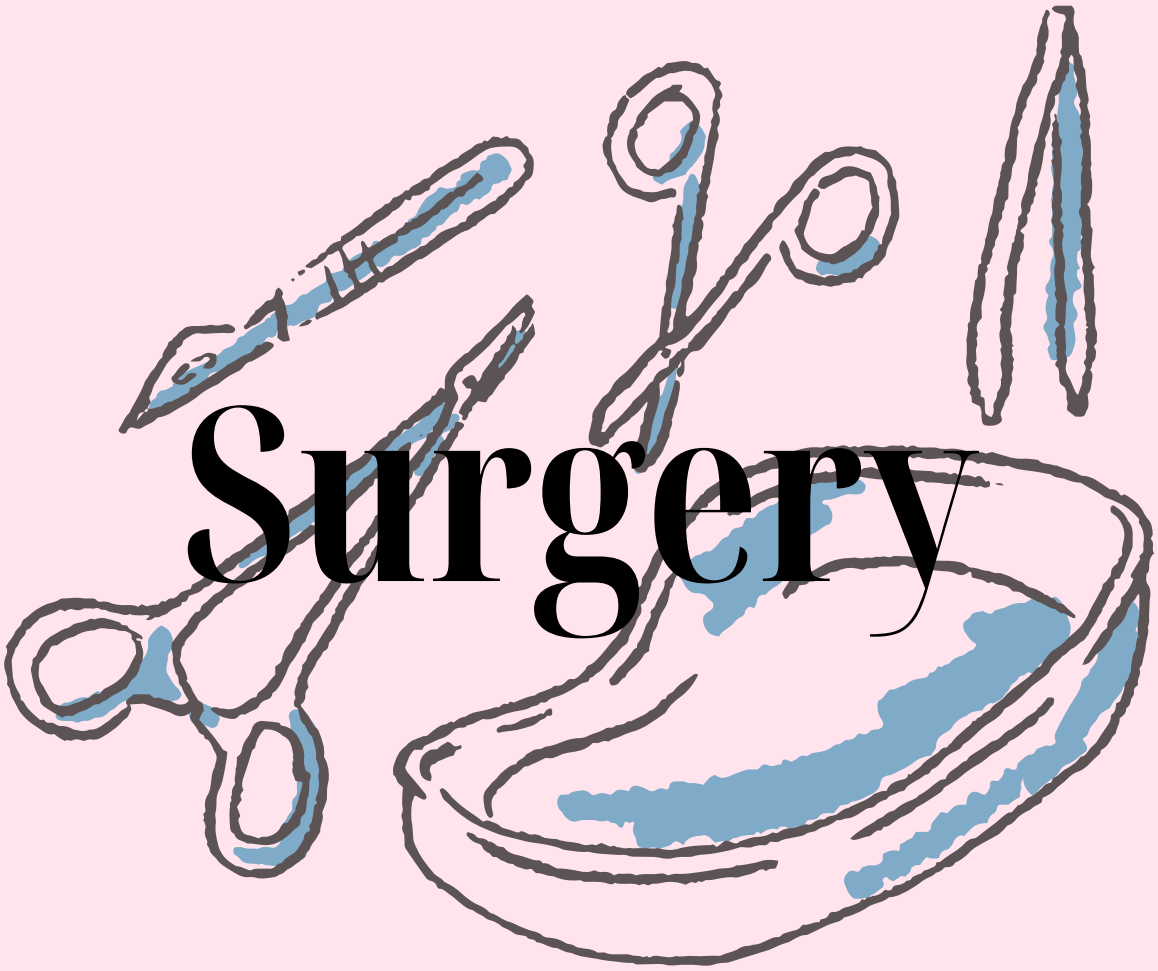
Supporters of these treatments argue that the goal is not to erase memories entirely but to reduce unnecessary suffering. PTSD can leave individuals trapped by intrusive memories for years, affecting their relationships, careers, and quality of life. If medicine can relieve that suffering, many believe it has a moral responsibility to do so. Researchers studying trauma-related memory modification have generally concluded that the potential benefits for patients outweigh many of the ethical concerns, provided that treatments are used carefully and with informed consent. For now, memory-erasing technology remains far less dramatic than science fiction suggests.

Scientists cannot simply delete memories at the push of a button. Instead, they are exploring ways to soften the emotional sting of traumatic experiences. Yet even this limited ability raises fascinating questions about identity, responsibility, and the role of medicine in shaping human experience.

As neuroscience continues to advance, society may soon have to decide not only what we can do with our memories, but also what we should do.

Niah 12RTH

Surgery



Growing Sight: How Stem Cell Science Is Restoring Corneas and Changing Vision Care

Introduction - A Sight-Saving Revolution

Imagine a treatment that helps your eye heal itself after serious injury - not just manage symptoms but restore the cornea's surface using your own cells. That's the promise of stem cell therapy for corneal repair, one of the most exciting advances in eye medicine in 2026. Scientists are now able to take specialised stem cells from a healthy eye, grow them in a lab, and transplant them into a damaged cornea to help regain clarity and improve vision.

Real clinical research now shows these techniques can be safe, effective and potentially transformative for patients who otherwise had few options.

What Is the Cornea and Why Does It Matter?

Your cornea is the transparent layer at the very front of the eye. It protects the eye and focuses light onto the retina, which sends visual information to the brain. If the cornea becomes damaged - through chemical burns, infections, or trauma - it can scar and lose its shape, causing pain, blurry vision, or even blindness.

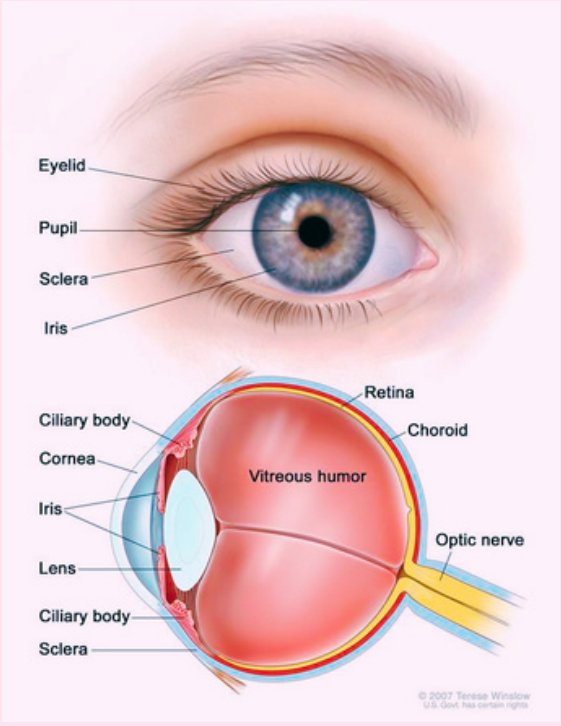
A crucial part of the cornea is the limbus, a ring of tissue at its edge that contains stem cells responsible for continually renewing the corneal surface. When those limbal stem cells are lost or depleted - a condition called limbal stem-cell deficiency - the cornea can't repair itself and vision is permanently affected.

How Stem Cell Therapy for Corneas Works

The most advanced therapy in human research as of 2026 is called cultivated autologous limbal epithelial cell (CALEC) transplantation. In this procedure:

1. Biopsy: Doctors take a tiny sample of limbal stem cells from the patient's healthy eye.
2. Lab Growth: These cells are expanded in the lab over 2–3 weeks to create a sheet or graft of cells ready for transplant.
3. Transplant: The graft is surgically placed onto the damaged cornea to rebuild the surface and restore healing capacity.

Because the cells come from the same person, this method reduces the risk of immune rejection and leads to more natural regeneration of the corneal surface.



Clinical Trial Success - Real Results in Patients

The most significant clinical evidence so far comes from a phase I/II trial led by researchers at Mass Eye and Ear and supported by the National Eye Institute (NEI) in the United States. In this study of 14 patients followed over 18 months:

- The CALEC treatment was safe with no serious adverse events related to the therapy.
- At 3 months, the cornea was completely restored in about 50% of patients.
- By 12-18 months, the overall complete and partial restoration rate was over 90%.
- All patients saw some improvement in their corneal surface, and many experienced improved visual clarity.

These results show that stem cell grafts can meaningfully rebuild the cornea's surface in cases previously considered untreatable.

Why This Matters for Patients

If approved for general clinical use, therapies like CALEC could:

- Give new hope to patients with limbal stem-cell deficiency from burns or chronic injury.
- Reduce dependence on traditional corneal transplants, which may fail when stem cells are absent.
- Improve long-term outcomes and quality of life for people with severe corneal damage.

Scientists are also exploring whether stem cell sources from donors, rather than only the patient's own eye, could be used in the future - especially for people affected in both eyes

Challenges and Future Direction

There are still hurdles before these treatments become widely available:

- CALEC remains experimental and not yet approved for routine use in hospitals.
- The current autologous method requires one healthy eye, limiting its use if both eyes are damaged.8
- Researchers are investigating ways to grow limbal stem cells from donors or even convert other cell types (like induced pluripotent stem cells) into corneal cells.
- Regulatory approval, larger trials, and long-term studies are needed before these therapies become a standard option.

In Europe, a related stem cell product called Holoclar has been approved for certain corneal surface conditions, showing how regenerative medicine in the eye is advancing worldwide. (Holoclar's approval details are available from the European Medicines Agency).

A Vision for the Future

Stem cell therapy is already proving that the eye's ability to heal itself can be unlocked even after severe injury. While still in the research phase, these technologies point toward a time when regenerative medicine could become a frontline tool in ophthalmology. From restoring sight to reducing the need for donor transplants, stem cell corneal repair is one of the most promising areas in medicine today.

Glossary

Cornea: The clear, outer layer of the eye that helps focus light.
Stem Cell: A cell that can divide and become different specialised cell types.
Limbus: The border region between the cornea and the white of the eye containing regenerative stem cells.
Limbal Stem-Cell Deficiency (LSCD): A condition where the cornea loses its ability to regenerate due to loss of stem cells.
Autologous: Cells or tissues taken from the same person who will receive the treatment.
Biopsy: A small sample of tissue taken for examination or use in treatment.
Graft: A piece of tissue used in a surgical transplant.
Regenerative Medicine: Treatments that help the body repair or regrow damaged tissues.

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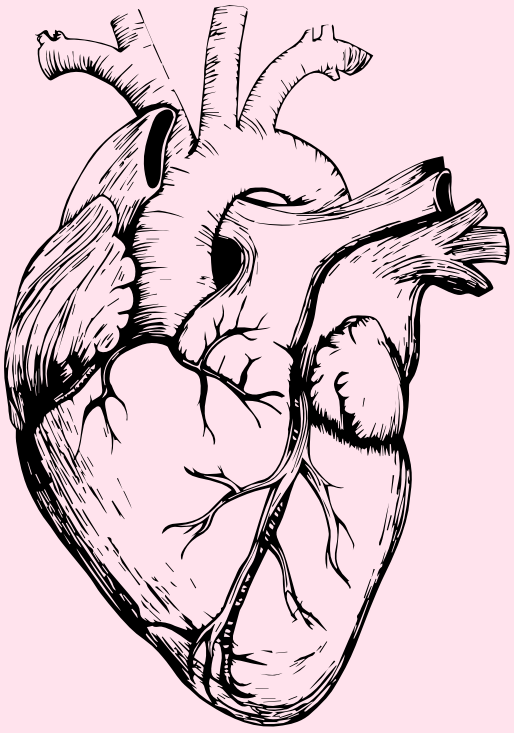
Christine 12RHA

Organ transplantation and the future of artificial organs

Organ transplantation is one of the greatest achievements in modern medicine. Every year, thousands of people receive life-saving organs such as hearts, kidneys, lungs, and livers. These procedures give patients a second chance at life and allow doctors to treat diseases that were once considered fatal. However, despite medical advances, there remains a major shortage of donor organs worldwide. This shortage has led scientists to search for alternative solutions, including artificial and lab-grown organs.

The future of medicine may include 3D-printed organs, bioengineered tissues, and mechanical organs capable of replacing damaged body parts permanently. These developments could transform healthcare and reduce the number of people waiting for transplants.



What is organ transplantation?
Organ transplantation is a surgical procedure in which a failing or damaged organ is replaced with a healthy one from a donor. Commonly transplanted organs include the kidneys, heart, liver, lungs, pancreas, and intestines.

The most frequently performed transplant is the kidney transplant because kidney disease affects millions of people worldwide. Patients with organ failure often rely on treatments such as dialysis or medication while waiting for a donor organ to become available.
There are two main types of organ donors:
Living donors - people who donate an organ or part of an organ while still alive.
Deceased donors - organs donated after death with prior consent or family permission.

Although transplantation can save lives, patients must take immunosuppressant drugs for the rest of their lives to prevent the immune system from rejecting the new organ. For successful transplantation, there must be compatibility between the donor and the recipient, including blood type, tissue type and sometimes size considerations. The recipient's immune system may recognise the new organ as foreign and attempt to reject it, so drugs are required. These immunosuppressive medications reduce the risk of injection but also increase susceptibility to infections and certain cancers.

The problem of organ shortages
The lack of available donor organs means that thousands of patients die each year while waiting for a new transplant. There are many factors which contribute to this shortage including: limited numbers of registered donors, incompatibility between donors and recipients, damage to organs before transplantation, increasing rates of chronic diseases such as diabetes and heart disease.

As populations age and diseases become more common, the demand for organs continues to rise. This crisis has encouraged researchers to develop artificial alternatives to help tackle the transplant waiting lists.

Artificial organs
These are devices or tissues created to replace the function of damaged organs. Many already exist and are used successfully in hospitals. They can include: artificial hearts, mechanical heart valves, cochlear implants, artificial limbs, dialysis machines acting as artificial kidneys.

Artificial organs minimise the risk of immune rejection, and do not depend on human donors. This means that this method of transplantation is often quicker and safer for the recipient.

3D printing and bioengineered organs
3D bioprinting is a technology which uses living cells as 'bio-ink' to press tissues and potentially entire organs layer by layer. Scientists have already created artificial skin, blood vessels, cartilage and miniature liver tissues. They hope that in the future, patients could receive organs made from their own cells, which would reduce the chance of immune rejection because the body would recognise the organ as its own tissue.

Bioengineering could also allow damaged organs to be repaired rather than completely replaced. For example, stem cells could regenerate heart tissue after a heart attack.

Xenotransplantation
This is the transfer of organs, tissues and cells from animals and is performed by selectively breeding domestic animals with anatomical and physiological characteristics that could be adapted to match the human body.
Pigs are considered the best animals for xenotransplantation due to their organs being of a similar size to humans, they reproduce quickly, they are widely bred for food and their organs function similarly to humans.

Although xenotransplantation could mean there are reduced waiting lists, fewer deaths due to organ shortages and more available organ for transplant patients, the human body naturally rejects animal organs. Scientists use genetic engineering to modify pigs organs so they are compatible with humans. This may involve removing specific genes while adding some human genes to reduce rejection risk. Other concerns include the possibility of animal viruses transferring to humans, and the long-term survival being uncertain. Scientists are unsure if animal organs can function inside the human body over many years.

Ethical issues

Organ transplantation raises several ethical concerns. One major issue is how donor organs are allocated. Doctors must decide which patients receive organs first, often based on urgency and survival chances meaning patients must be listed in order of 'priority'.

Artificial organs can also create ethical issues such as unequal access to treatment, genetic engineering of human tissues, and long term safety of artificial implants.

Some ethical concerns raised by xenotransplantation include: the fact that some animals are specifically bred for organ harvesting, the treatment and welfare of genetically modified animals, the risk of spread of new diseases, religious objections to animal organ use, and the cost of treatment meaning it may not be accessible.

Overall, organ transplantation offers a second chance at life, and can transform people's lives. However there are many risks and ethical concerns, meaning it requires careful consideration. Scientific advancements in organ transplantation represent a new era in medicine.There's still a chance for even safer, more effective treatments being discovered and developed for people with organ failure.

Maryam V, 12MCT

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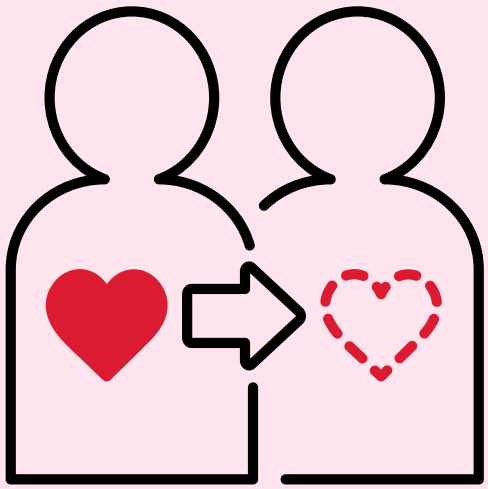


Mohs Surgery: The Precision Technique Revolutionising Skin Cancer Treatment

When most people think of surgery, they imagine a surgeon removing a tumour and stitching the wound closed. However, one specialised procedure is transforming the way doctors treat skin cancer by combining surgery, pathology, and reconstruction into a single process. Known as Mohs micrographic surgery, this technique has become the gold standard for treating many forms of skin cancer, particularly basal cell carcinoma and squamous cell carcinoma. What makes it remarkable is not only its effectiveness, but also its precision.

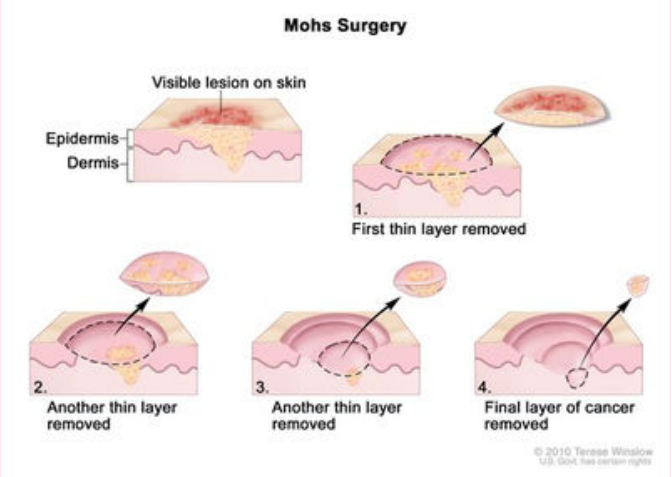
Skin cancer is one of the most common cancers worldwide. While many cases can be successfully treated, removing too much tissue can leave significant scarring, especially when cancers develop on highly visible areas such as the face, nose, eyelids, or ears. Mohs surgery was designed to solve this problem.

Unlike traditional surgery, where a tumour is removed and sent to a laboratory for analysis days later, Mohs surgery removes the cancer layer by layer. After each layer is removed, the tissue is immediately examined under a microscope. If cancer cells are still present, the surgeon removes another thin layer only from the affected area. This process continues until no cancer cells remain.

By examining virtually all of the tumour margins during surgery, Mohs surgeons can ensure that the entire cancer has been removed while preserving as much healthy skin as possible.

The results are impressive. Studies have shown cure rates of up to 99% for many newly diagnosed basal cell carcinomas, making Mohs surgery one of the most successful cancer treatments available. It also has significantly lower recurrence rates compared with conventional surgical excision.

What many people do not realise is that Mohs surgeons are trained in multiple disciplines. During a single procedure, they act as surgeon, pathologist, and reconstructive specialist. Once the cancer has been completely removed, they must often rebuild the affected area to achieve the best possible cosmetic and functional result. This can involve advanced techniques such as skin flaps or skin grafts, particularly when operating on delicate areas of the face.



The procedure has become increasingly important as rates of skin cancer continue to rise. Exposure to ultraviolet radiation from the sun remains the leading risk factor, meaning that many patients requiring Mohs surgery have cancers on sun-exposed regions such as the nose, forehead, scalp, and cheeks. Because these areas are so visible, preserving healthy tissue is essential.

Mohs surgery has also attracted public attention through high-profile patients. Former US President Joe Biden has undergone Mohs surgery to remove skin cancer lesions, helping to raise awareness of both skin cancer and modern treatment options.

Looking ahead, researchers are exploring ways to make skin cancer surgery even more precise through the use of artificial intelligence, advanced imaging technologies, and improved reconstructive techniques. While these innovations may shape the future, Mohs surgery already demonstrates how combining multiple areas of medicine can dramatically improve patient outcomes.

At its heart, Mohs surgery represents a simple but powerful idea: remove all of the cancer while preserving as much of the patient as possible. In an age of increasingly sophisticated medicine, it remains one of the clearest examples of how precision can save both lives and quality of life.

Tomi Olufeko 12JOR

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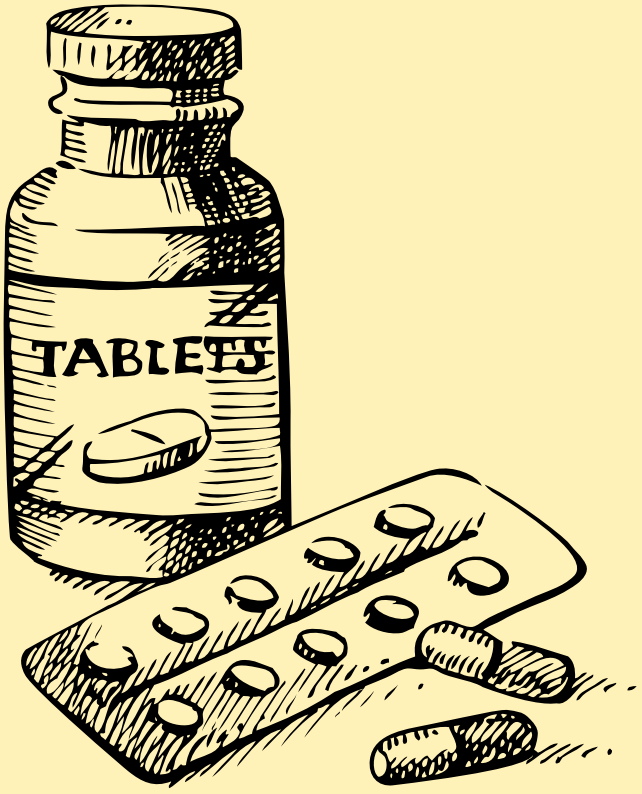
Alternative and Comparative Medicine



Should weight loss drugs like Ozempic be so accessible?

In recent years, Ozempic (semaglutide), a drug developed for Type 2 Diabetes, has experienced a shift in the reasons for its usage. The drug's main purpose of increasing insulin secretion has been widely overshadowed by its side effect of rapid weight loss which often seems to be promoted by extreme celebrity weight loss transformations, compounding Ozempic's reputation as the catalyst of a "Hollywood" weight-loss trend. Many deny allegations of weight-loss drug usage, whilst others, for example Meghan Trainor, Oprah Winfrey and Elon Musk, have openly admitted it - but regardless of how the extreme weight loss was actually achieved, the side by side comparison photos of pre and post weight loss achieved in such a short amount of time have been enough to encourage many people of the general public to turn to Ozempic and other such drugs too, even if they don't really need it. We see the idealistic weight loss, but often fail to assess the drug's true purpose and its many side effects, so should we really be able to freely access it?

<u>How does Ozempic actually work?</u>

Ozempic belongs to a group of drugs called GLP-1 agonists and is mostly administered by an injection to the abdomen, thigh or upper arm. GLP-1 (glucagon-like-peptide-1) receptor agonists are a class of medications that work by naturally mimicking the natural GLP-1 hormone to selectively bind to pancreatic receptors. This stimulates the body to produce and release more insulin only when blood sugar levels are elevated, hence used to treat Type 2 diabetes. It also suppresses excessive glucagon secretion, which helps prevent the liver from releasing too much glucose. The hormone also slows gastric emptying, keeping food in your system for longer and delaying the return of hunger. This leads to a natural decline in calorie intake due to appetite regulation, ultimately leading to the rapid weight loss that the drug is most commonly associated wit

<u>Should we be able to access Ozempic easily?</u>

Getting Ozempic in the UK is difficult due to high demand and strict supply prioritisation. The MRHA (essentially the British version of the FDA) emphasises that Ozempic is licensed solely for the treatment of adults with insufficiently controlled type 2 diabetes, however it was also previously being prescribed 'off label' for weight loss. The drug can now only be used for weight loss in the UK through Wegovy, which contains the same active ingredient (semaglutide) that Ozempic has but in a smaller amount. Ozempic can also be prescribed to people with a BMI of 35kg/m2 or more and have additional psychological or other medical conditions that are related to obesity.

Ozempic can benefit people with diabetes and/or obesity by reducing the risk of heart disease and stroke caused by high blood sugar levels. GLP-1 medications have also been linked to decreased risk of dementia addiction to substances such as alcohol, cannabis, stimulants and opioids, as GLP-1RA drugs act on receptors that are expressed in the brain areas involved in impulse control, reward and addiction which potentially explains their effectiveness in curbing appetite and addiction disorders. The drugs also reduce inflammation in the brain, which may explain the reduced risk of conditions like Alzheimer's disease and dementia.
Despite changes to regulations in prescribing drugs like Ozempic, the effects of supply shortages stemming from off-label prescriptions for weight loss, complex manufacturing processes, and global demand outpacing production still cause people with Type 2 diabetes and obesity in the UK to face significant persistent struggles accessing Ozempic. To try and overcome these shortages, a rising number of people (including people who are not diabetic or obese) are turning to the private market for weight loss drugs, which has worsened the availability of GLP-1 medications for those with NHS prescriptions.

In addition, the positive effects of the drug, as well as the glorified weight loss, potentially come with many negative side effects. The most common include diarrhoea, abdominal pain, constipation and vomiting. Physicians must also be vigilant for signs of pancreatitis (where the pancreas becomes inflamed over a short period of time) and monitor kidney function among people taking GLP-1RA medications. There have also been reports of a possible increased risk of suicidal thoughts and thoughts of self-harm when taking some GLP1-RA drugs. Although these thoughts can be influenced by many other factors and initial investigations have found that there was no evidence of this, the small number of people experiencing these thoughts whilst on the drug cannot be negated or rule out the small risk of the drug being the main cause.
Focusing specifically on the seemingly miraculous weight loss, studies have shown that after a year of stopping taking weight loss drugs such as Ozempic and Wegovy, people regain on average 60% of their lost weight, which contributes to arguments that the drug is 'not worth it' for weight loss, or shouldn't be prescribed for it at all except in extreme circumstances.
"Drugs such as Ozempic and Wegovy act like brakes on our appetite. When people stop taking them, they are essentially taking their foot off the brake." – Brajan Budini

And indeed, during Ozempic usage, many experience the famous ‘Ozempic face’, which is typically how people form allegations of weight-loss drug usage against celebrities over social media. ‘Ozempic face’ describes a gaunt, aged appearance with sagging skin, sunken eyes, and hollowed cheeks resulting from rapid fat loss in the face, as the facial skin loses elasticity faster than it can adapt.

To conclude, whilst Ozempic offers real medical benefits, its growing use as a quick weight-loss solution to conform with trends and idealistic beauty standards ultimately takes the drug away from the people with diabetes and obesity that need it the most, raising ethical concerns about the fairness of healthcare. Even though the rapid weight loss is extremely appealing, by taking the drug for reasons other than treating diabetes/obesity, you put your body under risk of experiencing many negative side effects that compromise your health, which justifies arguments to make GP1-RA drugs less accessible.

Praveena 12JOR

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Ancient Indian Medicine — Origins, Evolution & Modern Scientific Relevance

Ancient Indian medicine, rooted in the Ayurvedic tradition, represents one of humanity's oldest and most comprehensive healing systems. Developed over millennia, it integrates herbal pharmacology, surgical innovation, mind–body practices, and holistic lifestyle principles. Today, modern science increasingly validates many of its insights, demonstrating that ancient Indian medicine was far ahead of its time. This report explores its key medicinal plants, classical formulations, therapeutic practices, and their modern scientific relevance.

Ashwagandha, known traditionally as a Rasayana, was used to enhance strength, vitality, and resilience, especially among warriors. Modern research confirms its ability to lower cortisol, reduce anxiety, and improve sleep and cognitive performance. Interestingly, its name means "smell of a horse," symbolizing the vigor it was believed to impart.

Turmeric has long been prized for its antiseptic and anti-inflammatory properties, used on wounds and for digestive issues. Today, curcumin—the active compound—has been shown to rival some anti-inflammatory drugs and is widely used for arthritis, metabolic health, and skin conditions. Despite being only a small fraction of the root, curcumin is one of the most studied natural compounds in the world.

Neem was traditionally used for skin diseases, infections, and purification, with neem twigs serving as natural toothbrushes. Modern dermatology recognizes its antibacterial and antifungal properties, making it effective for acne, eczema, and wound care. Archaeological evidence shows neem use dating back over 4,500 years to the Indus Valley Civilization.

Tulsi, or Holy Basil, was revered both medicinally and spiritually, used for fever, respiratory issues, and immunity. Modern studies confirm its adaptogenic and antimicrobial effects, particularly for respiratory health. Many Indian households still maintain a Tulsi plant as a symbol of protection.

Amla, one of the most important Ayurvedic fruits, was used for longevity, digestion, and immunity, and remains a key ingredient in the famous tonic Chyawanprash. Modern science identifies it as one of the richest natural sources of vitamin C, with powerful antioxidant and anti-aging effects. Remarkably, Amla retains its vitamin C content even after cooking.

Bitter gourd, or Karela, was traditionally used to manage diabetes and digestive disorders. Today, compounds like charantin and polypeptide-P are recognized for their blood sugar–lowering effects, and studies show it can suppress sweet taste receptors. Some research even compares its efficacy to metformin in mild diabetes.

Moringa, used in ancient times for nourishment and lactation, is now celebrated globally as a superfood. Modern analysis reveals its exceptional nutrient density, including vitamins A, C, and E, and its ability to regulate blood sugar and cholesterol. Its versatility has earned it the name “Miracle Tree.”

Shatavari was traditionally used to support female reproductive health, fertility, and lactation. Modern research highlights its phytoestrogenic properties, which help balance hormones and ease menopausal symptoms. Its name translates to “she who has a hundred husbands,” reflecting its association with vitality.

Brahmi served as a brain tonic for students, monks, and scholars seeking enhanced memory and concentration. Today, it is recognized for improving cognitive function, learning speed, and neuroprotection. It remains a key ingredient in Ayurvedic memory-enhancing oils.

Giloy, or Guduchi, was used for fever, immunity, and detoxification, and was considered an elixir of longevity. Modern studies confirm its immunomodulatory and anti-inflammatory effects, making it useful for chronic fever and metabolic disorders. Its Sanskrit name “Amrita” means “nectar of immortality.”

Guggul, a resin mentioned in the Atharva Veda, was used for obesity, arthritis, and detoxification. Modern research shows that guggulsterone helps reduce LDL cholesterol and inflammation, making it valuable for heart and joint health. Its long history makes it one of Ayurveda’s oldest documented remedies.

Haritaki, revered for its digestive and cognitive benefits, was believed to balance all three doshas and promote longevity. Modern science confirms its antibacterial, antioxidant, and digestive-supporting properties. Tibetan medicine refers to it as the “King of Medicines.”

Arjuna was traditionally used as a heart tonic and wound healer, especially for warriors. Modern cardiology recognizes its ability to improve cardiac function, reduce angina, and support healthy blood pressure. Its association with the warrior Arjuna reflects its heart-strengthening qualities.

Safed Musli was used for vitality, fertility, and strength, and was considered a powerful aphrodisiac. Today, it is used in sports nutrition for its testosterone-boosting and performance-enhancing effects. Its rarity once earned it the nickname “White Gold.”
Bael was used for digestive disorders such as diarrhea and dysentery and is considered sacred in Hindu tradition. Modern research confirms its antimicrobial effects and benefits for IBS and gut health. Its fruit shell is so hard that it must be cracked with a hammer.
Ashoka was used for menstrual disorders and uterine health and symbolized beauty and love in ancient literature. Modern studies show its flavonoids support menstrual regulation and reduce inflammation. Its fragrant flowers make it a common temple tree.
Triphala, a classical Ayurvedic formulation of Amla, Haritaki, and Bibhitaki, was used for digestion, detoxification, and longevity. Modern research shows it supports gut microbiome diversity, acts as a gentle laxative, and provides strong antioxidant benefits. It is one of the oldest continuously used herbal formulas in the world.

Ancient Indian medicine also excelled in surgical innovation, most notably through Sushruta’s rhinoplasty technique. Used to reconstruct noses lost in battle or punishment, his forehead flap method remains foundational in modern reconstructive surgery. Sushruta documented over 120 surgical instruments and 300 procedures, demonstrating remarkable anatomical knowledge.

Panchakarma, a detoxification and rejuvenation system, used five cleansing actions to restore balance and prevent disease. Modern studies show it reduces inflammation and improves metabolic health, and it remains popular in global wellness tourism.

Phototherapy, used in ancient times by exposing jaundiced infants to sunlight, finds its modern counterpart in neonatal blue-light therapy. This continuity highlights Ayurveda’s early understanding of light-based healing.
Marma therapy, which targeted vital energy points, was used for healing and martial training. Modern sports medicine recognizes its ability to improve circulation and reduce pain, with many marma points corresponding to modern trigger points.
Ayurvedic acupressure-like techniques were used to relieve pain and balance energy, and today they resemble reflexology and physiotherapy. Ancient warriors were trained to protect these vital points in combat.
Mind–body practices formed another pillar of ancient Indian medicine. Yoga, originally a spiritual discipline, is now globally recognized for reducing anxiety, depression, and chronic pain while improving cardiovascular health. UNESCO has acknowledged it as intangible cultural heritage.

Meditation, used for enlightenment and emotional control, is now known to increase gray matter in the brain and reduce stress hormones. Long-term practitioners show brain patterns associated with younger individuals.
Pranayama, the yogic science of breath control, was used to regulate life force. Modern research shows it improves lung capacity, reduces anxiety, and balances the autonomic nervous system.

Shirodhara, a therapy involving warm oil poured on the forehead, was used to calm the mind and treat insomnia. Today, it is shown to reduce stress and improve sleep quality.
Oil pulling, traditionally practiced with sesame oil for oral detoxification, is now recognized for reducing harmful oral bacteria, plaque, and gum inflammation. Coconut oil has become a modern alternative, though sesame remains the classical choice.
Ancient Indian medicine also laid the foundation for modern pharmacology. Ayurveda documented over 700 medicinal plants, many of which inspired modern drugs, including anticancer agents. Its emphasis on natural compounds continues to influence drug discovery.

Holistic wellness, a cornerstone of Ayurveda, emphasized prevention through diet, lifestyle, and mental balance. Modern lifestyle medicine echoes these principles, and the global wellness industry—now worth trillions—draws heavily from Ayurvedic concepts.
The AYUSH Ministry in India preserves and advances traditional systems such as Ayurveda, Yoga, Unani, and Siddha. It funds clinical trials, standardizes treatments, and promotes global integration of ancient Indian medical knowledge.
Together, these herbs, practices, and innovations demonstrate that ancient Indian medicine was not only sophisticated but remarkably aligned with modern scientific understanding. As research continues to validate its principles, Ayurveda's holistic, preventative, and integrative approach offers a powerful model for the future of global healthcare.

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