



## The intersection of osteoarthritis, physical activity, and mental health

Osteoarthritis (OA) is a prevalent chronic condition affecting millions globally, leading to significant pain and disability. Beyond its physical toll, OA is frequently associated with high rates of depression, exacerbating the overall burden on individuals. While managing the physical symptoms of OA remains a primary focus, addressing the associated mental health issues is equally crucial. One promising avenue in this regard is physical activity.

Physical activity has long been recognised for its myriad health benefits, including enhancing mood and reducing symptoms of depression. However, its specific impact on individuals with OA, particularly concerning how pain levels influence this relationship, is not fully understood. This gap in knowledge is critical, given the high prevalence of both OA and depression.

A recent study published in PLOS Global Public Health sought to unravel this complex relationship. Researchers recruited individuals with OA awaiting orthopaedic consultation at a public hospital in Melbourne, Australia. They collected data on participants' pain levels, physical activity engagement, and depression symptoms.

The findings revealed that the relationship between physical activity and depression was influenced by pain levels. Specifically, the benefits of physical activity on reducing depression symptoms were more pronounced in individuals experiencing higher levels of pain. Additionally, engaging in physical activity helped reduce pain, which in turn led to a decrease in depression symptoms.

These results underscore the importance of physical activity, particularly for individuals with greater OA-related pain, as it offers significant mental health benefits. Encouraging physical activity could be a vital strategy in managing depression among OA patients, providing a holistic approach to their care and well-being.

## Munich AIDS conference unveils new HIV cure case and bold global projections

### STAR HEALTH DESK

The 25<sup>th</sup> International AIDS Conference, held in Munich, Germany, from July 22-26, 2024, brought together thousands of scientists, policymakers, and advocates to discuss the latest advancements in HIV research. This year's conference, hosted by the International AIDS Society (IAS), was marked by groundbreaking developments, including a unique HIV cure case, new global HIV projections, and promising advancements in HIV and STI prevention strategies.

One of the most notable highlights was the announcement of the "next Berlin Patient," the seventh person in the world to be cured of HIV following a stem cell transplant. This case was particularly significant because, for the first time, the donor had a single CCR5-delta32 mutation rather than the double mutation seen in previous cases. This finding could have profound implications for future research into scalable HIV cure strategies.

The "next Berlin Patient," an adult male who had both leukaemia and HIV, received a stem cell transplant for leukaemia in late 2015. In late 2018, he stopped taking antiretroviral treatment for HIV, and over five and a half years later, he remained in HIV remission. The patient's donor had inherited just one copy of the CCR5-delta32 mutation, known as heterozygous, which allows individuals to acquire HIV but generally causes the virus to progress slowly without antiretroviral treatment.

This contrasts with previous cases where donors had two copies of the mutation, making them essentially immune to HIV. This new finding suggested that effective HIV remission could be achieved with a broader pool of donors, which holds promise for future gene therapy-based HIV cure strategies.



In addition to this groundbreaking case, the conference also unveiled new projections from UNAIDS, highlighting the urgent need for bold action in the global HIV response. The projections indicated that without significant efforts, there could be nearly 35 million new HIV acquisitions and nearly 18 million AIDS-related deaths between 2021 and 2050. The analysis emphasised the critical importance of achieving the "95-95-95" targets, where 95% of people living with HIV know their status, 95% of those who know their status are on treatment, and 95% of those on treatment are virally suppressed. Failing to meet these targets would result in significant human and economic costs, with the study estimating an average cost of inaction per capita of USD 670 in low- and middle-income countries by 2050.

Promising advancements in HIV and STI prevention were also highlighted. Two studies presented at the conference suggested that doxycycline pre-exposure prophylaxis (DoxPrEP) could be a highly effective strategy for preventing sexually

transmitted infections (STIs). One study involving female sex workers in Tokyo found that DoxyPrEP significantly reduced the incidence of STIs with high adherence and minimal adverse effects reported. These findings supported the potential of DoxyPrEP as a valuable prevention strategy for populations at high risk of STIs.

Another key study from the Netherlands explored the potential benefits of reducing the frequency of monitoring visits for HIV pre-exposure prophylaxis (PrEP) users. The study found that screening PrEP users for STIs every six months instead of the standard three months could reduce the burden on users and cut costs without increasing STI rates.

The conference also included the presentation of late-breaking full results from the PURPOSE 1 trial of long-acting injectable lenacapavir for HIV prevention, which demonstrated 100% efficacy in cisgender women. This marked another significant advancement in the ongoing effort to develop effective HIV prevention strategies.

## BIRTH DEFECTS Re-evaluating paternal metformin use

In recent years, concerns have emerged regarding the potential impact of paternal use of metformin, a common diabetes medication, on the risk of birth defects in offspring.

A provocative Danish study published in 2022 in the Annals of Internal Medicine suggested that men who took metformin shortly before conception had an increased risk of fathering children with birth defects. This study hypothesised that metformin could adversely affect spermatogenesis, a mechanism observed in some animal studies.

A new study, published in the Annals of Internal Medicine, has now investigated this issue in a different population. Researchers analysed data from 1,730 fathers with diabetes in an Israeli health system database who were on metformin during the 90 days before conception.

Their findings provide a more nuanced perspective on the potential risks associated with metformin use by prospective fathers. The study adjusted for various potential confounders, including demographic, cardiometabolic, and maternal factors. The results indicated that metformin monotherapy was not linked to an increased risk of major congenital malformations when compared to the offspring of 380,000 control fathers who had no exposure to diabetes medications. However, the offspring of men who took metformin in combination with other diabetes medications showed a slightly higher incidence of malformations, though this finding was only of borderline statistical significance.

These findings offer some reassurance for men with diabetes who require metformin therapy but also underscore the importance of further research to fully understand the potential reproductive implications of diabetes medications.



## Occupational therapy for Parkinson's disease

### RABEYA FERDOUS

Parkinson's disease is a very common disorder in our country. According to the latest World Health Organisation (WHO) data published in 2020, Parkinson's disease deaths in Bangladesh reached 3,782 or 0.53% of total deaths. In Bangladesh, death rank is 125 among the world.

Parkinson's disease is a neurodegenerative disorder that leads to shaking, stiffness, and difficulty with walking, balance, and coordination.

Symptoms may vary from mild to severe. Some common symptoms are given below:

- Bradykinesia or slowness of movement
  - Tremor
  - Postural imbalance
  - Speech difficulty
  - Writing problem
  - Dementia
  - Emotional changes
  - Memory training
- Occupation means activity. An occupational therapist helps to make their life independent in their daily activities. Regular exercises may increase the thinking power. It can increase patients' cognitive skills.

According to the patient's condition, the occupational therapist provides the following therapy:

- Functional gait retraining
- Functional balancing exercises
- Practice bilateral hand activity
- Practice fine motor skills
- ADL's training like dressing, eating, grooming, etc.
- Practice writing
- Falling intervention by modifying their home. e.g., bathroom/kitchen/bedroom modification
- Educate patients about energy conservation techniques
- In the late stage, educate the patient and their carer about appropriate transferring techniques
- Engaging the patients in leisure activities to refresh their minds, like gardening, watching movies, or visiting their relatives house or other



places

- Moderate to Strong evidence for targeted physical activity training that addressed motor performance, postural stability, and balance

An occupational therapist helps to search for the right equipment to help with difficulties.

Though Parkinson's disease is a degenerative neurological condition, research has consistently found certain types of interventions improve function. Additionally, continuation of services is crucial to maintaining therapeutic gains.

Interventions for individuals with Parkinson's disease consistently fall into three categories:

- (1) exercise or physical activity,
- (2) environmental cues, stimuli, and objects, and
- (3) self-management and cognitive behavioural strategies.

Clinical application points to the provision of intervention that focuses on targeted physical activity to address specific functional outcomes.

When you have patients with Parkinson's disease, then contact a qualified occupational therapist. S/he can help your patient become independent in day-to-day activities.

The writer is an occupational therapist at the Department of Physical Medicine and Rehabilitation at the National Institute of Neurosciences and Hospitals (NINS&H). Email: rabeya1988@gmail.com

## Machine learning models predict disability progression in multiple sclerosis

### STAR HEALTH REPORT

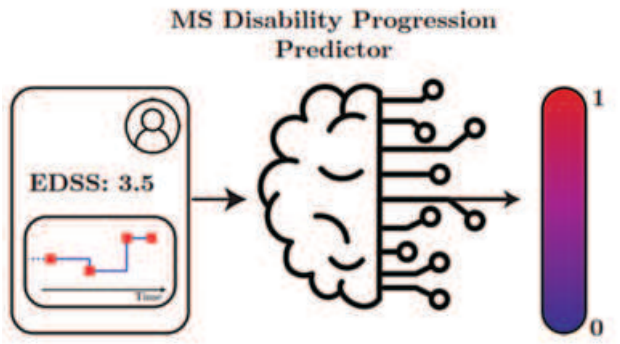
A recent study has demonstrated that machine learning models can effectively predict how multiple sclerosis (MS) will progress in patients, offering new hope for improved disease management. The research, led by Edward De Brouwer from KU Leuven in Belgium, was published this week in PLOS Digital Health.

Multiple sclerosis is a chronic and progressive disease where the immune system attacks the protective sheath around nerves, leading to worsening disability over time. With the global prevalence of MS rising by more than 30% over the past decade, predicting its progression has become increasingly important. Accurate forecasts can help patients plan their lives better and allow doctors to tailor treatments more effectively.

The study analysed data from 15,240 adults with at least three years of MS history. These patients were treated at 146 MS centres across 40 countries, providing a comprehensive dataset. Researchers used this data to train sophisticated machine learning models to predict the likelihood of disease progression over the next few

months and years.

The results were promising. The models showed an average predictive accuracy score of 0.71 out of 1. This score, known as the area under the receiver operating characteristic curve (ROC-AUC), reflects how well the models can predict future disability progression. Higher scores indicate better performance. Importantly,



the study found that a patient's past disability progression was a stronger predictor of future progression than their treatment or relapse history.

Edward De Brouwer highlighted the significance of the study, stating, "Using the clinical history of more than 15,000 people with multiple sclerosis, we trained a machine learning model capable of reliably

predicting the probability of disability progression in the next two years. The model only uses routinely collected clinical variables, which makes it widely applicable."

These findings suggest that machine learning models could greatly enhance how MS is managed. By providing accurate predictions, these models can help doctors make better treatment decisions and assist patients in planning for their future. Since the models use standard clinical data, they could be easily integrated into everyday clinical practice.

The researchers believe their models have significant potential to improve the quality of life for MS patients. They recommend further studies to test the models' effectiveness in real-world settings. The advancements in machine learning represent a major step forward in understanding and managing complex diseases like multiple sclerosis.

This study highlights how technology can provide valuable insights and support better healthcare decisions, offering new hope for patients dealing with chronic and progressive conditions.

## Physiotherapy approaches for functional neurologic disorders

Functional neurologic disorders (FNDs), previously known as conversion or psychogenic disorders, are characterised by neurological symptoms that lack an obvious physical cause on standard diagnostic tests. These disorders are believed to stem from disruptions in brain network function rather than structural abnormalities. The effectiveness of specialised physiotherapy in treating these conditions remains unclear.

A recent trial published in The Lancet Neurology sought to



address this gap by comparing the clinical effectiveness of specialised physiotherapy versus usual physiotherapy in managing functional motor disorders.

The study highlights that while both physiotherapy approaches led to improvements in physical functioning, further research is needed to determine the optimal timing, components, and intensity of physiotherapy for FND.

Future trials should also focus on identifying which patients are most likely to benefit from such interventions.



## Three successful TAVR performed in one day at United Hospital

At United Hospital in the capital, three patients underwent successful artificial aortic valve replacement without cardiac surgery on the same day, which is a breakthrough in heart disease treatment in Bangladesh, says a press release.

For the first time in Bangladesh, one of the TAVR cases was successfully performed, protecting the main blood vessels of the heart.

Renowned cardiologist Dr NAM Momenuzzaman and Professor Afzalur Rahman performed the procedures.

Aortic valve stenosis or damage to the heart requires treatment with an artificial valve replacement. Valve replacement is usually done surgically. However, in developed countries, valve replacement is now an accepted treatment method for elderly or over 65-year-old and complex patients, known as TAVR.

Early in 2017, NAM Momenuzzaman and his team performed the first TAVR in Bangladesh at United Hospital. It is highly recommended that the main blood vessel of the heart be protected (coronary protection) during valve replacement for aged patients with narrow blood vessels or aortas. This complex procedure is now being successfully performed in Bangladesh.