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X-ray Imaging: Breakthrough chest X-ray AI surpasses tech giants with open-source model

UK Report: Government unveils major NHS transformation

In the News

- Thumbay Group launches AED 3 million research grant to advance global medical innovation
- Informa consolidates Dubai healthcare events to create world's largest medical exhibition
- KFSHRC completes first robotic Ivor Lewis esophagectomy in Middle East

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Prognosis

AI is transforming medicine – from burnout solutions to precision diagnostics

In this issue, we explore how artificial intelligence is rapidly changing healthcare delivery, with breakthrough studies showing real improvements in patient care, physician wellbeing, and diagnostic accuracy.

Two major studies show how AI is solving critical healthcare problems right now. At Mass General Brigham, AI documentation tools cut physician burnout by more than 20% amongst 1,430 doctors and nurses, giving clinicians their nights and weekends back. Meanwhile, in Kenya, an AI system called AI Consult reduced diagnostic errors by 16% and treatment mistakes by 13% across nearly 40,000 patient visits. The technology works like having a consultant in the room, catching problems before they harm patients.

Also in this issue, we look at X-ray imaging developments that are making sophisticated medical diagnosis more accessible globally. Arizona State University researchers created an open-source AI system called Ark+ that beats Google's and Microsoft's chest X-ray tools at diagnosing lung diseases. Unlike expensive proprietary systems, Ark+ is freely available to hospitals worldwide. Japanese scientists also developed AI that can spot early osteoporosis from routine spine X-rays, achieving 86% accuracy in detecting bone loss – potentially transforming millions of standard X-rays into powerful screening tools.

Our Neurology section reveals precision medicine breakthroughs on two fronts. Dutch researchers identified specific brain wave fingerprints for obsessive-compulsive disorder by studying patients with implanted electrodes. These neural signatures could enable smart brain stimulation devices that activate only when symptoms appear. Canadian scientists also discovered that the best way to train neurosurgeons combines AI analytics with human expertise – hybrid training models outperformed both traditional teaching and AI-only approaches.

Our United Kingdom Healthcare Report examines Britain's ambitious plan to create "the world's most AI-enabled health system" by 2035. The government promises £29 billion for a complete NHS transformation, featuring AI assistants for every doctor and nurse, genomic testing for all newborns, and neighbourhood health centres replacing traditional hospital-centred care. However, health experts question whether the funding and timeline are realistic given the scale of proposed changes.

These developments show AI moving from experimental technology to practical healthcare solutions that are already improving patient outcomes and physician satisfaction worldwide.

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contents

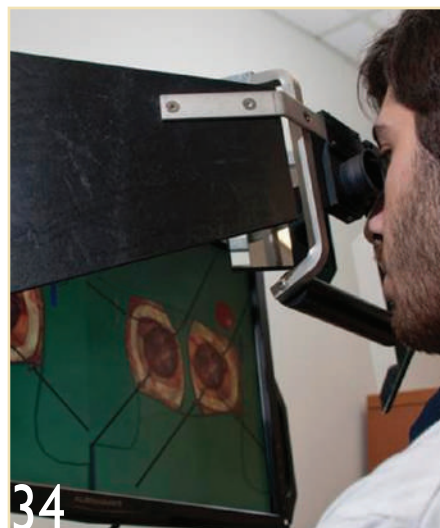
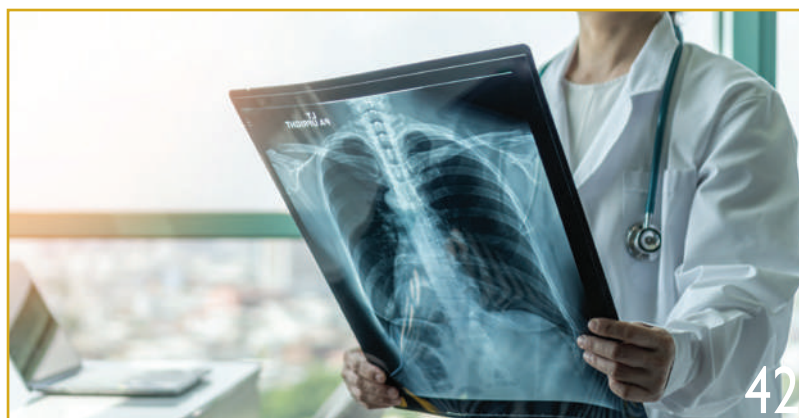


NEWS

- 6 Middle East Monitor
- 12 The Laboratory

FOCUS

- 18 **AI in Healthcare:** AI scribes slash physician burnout by more than 20% in landmark multicentre study
- 19 **AI in Healthcare:** AI copilot dramatically reduces clinical errors in Kenya primary care study
- 28 **UK Healthcare Report:** Government unveils major NHS transformation targeting AI-enabled healthcare by 2035
- 34 **Neurology:** AI-enhanced human instruction outperforms standalone artificial intelligence in neurosurgical training
- 35 **Neurology:** Brain wave patterns reveal neural fingerprints of obsessive-compulsive disorder
- 42 **Imaging - X-ray:** Breakthrough chest X-ray AI surpasses tech giants with open-source model
- 43 **Imaging - X-ray:** Artificial intelligence transforms routine X-rays into powerful osteoporosis screening tool





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middle east monitor

Update from around the region

Rhazes AI deploys clinical scribes pilot in Lebanon refugee hospital amid humanitarian crisis

UK-Qatar health tech startup launches first-of-its-kind AI clinical assistant pilot at Al Hamshari Hospital, serving Palestinian refugees in southern Lebanon. The controlled trial evaluates artificial intelligence's capacity to reduce administrative burden on frontline doctors managing extreme patient loads in under-resourced environments.



Al Hamshari Hospital

A pioneering deployment of artificial intelligence clinical scribes has commenced at Al Hamshari Hospital in southern Lebanon, marking the first structured implementation of AI assistance technology within a conflict-affected health system. The initiative, led by UK-Qatar startup Rhazes AI, represents a significant shift in how advanced medical technologies can be adapted for humanitarian healthcare settings.

Critical healthcare infrastructure under pressure

Al Hamshari Hospital, operated by the Palestine Red Crescent Society near Ein el Hilweh refugee camp, faces extraordinary operational demands. With 80 beds, 56 doctors, and 31 nurses, the facility serves over 4,000 patients monthly whilst performing more than 400 surgeries during crisis periods. The hospital remains the sole provider of dialysis services for southern Palestinian refugee camps in Lebanon.

Palestinian refugees in Lebanon are systematically excluded from the national healthcare system, creating an isolated medical ecosystem where facilities like Al Hamshari must provide comprehensive care with limited international support. This exclusion compounds the clinical workload, with doctors frequently managing upwards of 60 patients daily across multiple specialties.

The hospital's medical staff, predominantly Palestinian doctors, function simultaneously as generalists, specialists, and emergency physicians due to the absence of referral pathways or tertiary care facilities. This multidisciplinary approach,

whilst necessary, intensifies the administrative and clinical burden on individual practitioners.

AI technology adaptation for low-resource environments

Rhazes AI's clinical assistant platform addresses these challenges through real-time consultation transcription, diagnostic reasoning support, and evidence-based management plan generation. The agentic system operates without requiring extensive hospital infrastructure, adapting to the resource constraints typical of humanitarian medical facilities.

The technology automates documentation processes, generating structured summaries, admission notes, billing codes, and patient record insights. This functionality directly targets the administrative burden that disproportionately affects overstretched clinical teams in under-resourced settings.

Dr Zaid Al-Fagih, co-founder and CEO of Rhazes AI, commented: "This collaboration is about bringing tools usually reserved for high-tech, high-resource hospitals into the hands of clinicians working on the frontlines. Advanced tools don't need to wait for perfect conditions, they, and should, start where the need is greatest."

Clinical evidence base and implementation methodology

The deployment builds upon previously published evidence in Emergency Medical Journal demonstrating the platform's capacity to reduce documentation time by over 60 percent. The current pilot operates as a non-randomised, controlled



Dr Zaid Al-Fagih, co-founder and CEO of Rhazes AI

implementation trial from August to November 2025, assessing impacts on documentation time, decision confidence, and patient flow.

Rola Soboh, a Rhazes AI associate implementing the pilot, highlighted the personal significance of the initiative: "Doctors here don't just treat patients, they carry entire communities. So, when we talk about easing their load, it's not just administrative, it's emotional, physical, everything."

The pilot represents a critical evaluation of AI technology's applicability in humanitarian healthcare contexts, potentially establishing frameworks for similar implementations across under-resourced medical environments globally. The partnership between Rhazes AI and the Palestine Red Crescent Society demonstrates how private sector innovation can address systematic healthcare inequities in conflict-affected regions. MEH

Five Faces launches digital patient engagement platform for King's College Hospital Dubai

King's College Hospital London in Dubai has partnered with Australian digital health company Five Faces to deploy a next-generation patient engagement system called the King's Hub, featuring bilingual capabilities and integrated digital citizenship functionality across 28 ambulatory care specialties.

The King's Hub represents a significant advancement in digital healthcare infrastructure, designed to consolidate multiple patient touchpoints into a unified, bilingual platform supporting both Arabic and English languages. The system integrates appointment scheduling, check-in processes, queue management, diagnostic results access, correspondence retrieval, pharmacy prescription requests, and valet services into a single digital interface.

Digital citizenship framework enhances patient connectivity

Central to the platform's innovation is the Digital Citizenship Card concept, which provides patients with a persistent digital identity within the King's healthcare ecosystem. This approach extends beyond traditional episodic care models by establishing continuous patient-provider relationships through technology-mediated engagement.

"This is about leveraging next-generation technology to hyper-personalise the patient experience," said Sandip Kumar, Chief Digital and Innovation Officer at King's College Hospital London in Dubai. "It's a reimagining of how patients engage and connect with their care. We are proud to be creating a healthcare environment that is seamless, patient-focused, and one that reflects the values of King's."

The platform's architecture incorporates Oracle Cerner integration for appointment scheduling and diagnostic results management, whilst connecting to additional systems for clinical correspondence and transport services. This multi-system integration approach addresses the complexity of modern healthcare delivery environments.



AI enhancement drives intelligent patient interactions

The King's Hub leverages artificial intelligence and automation capabilities to provide intelligent, intuitive patient guidance throughout care journeys. This technological approach aims to reduce administrative burden whilst improving patient experience quality and accessibility.

Five Faces CEO Nicole Nixon emphasised the platform's patient-centric design philosophy: "Around the world, patients are asking for the same thing: convenience, control, and clarity. The King's Hub shows what's possible when digital health is treated as a unified experience, not just clinical care but every touchpoint. We need to remember that patients are people first, and design experiences that empower them to be active participants in their care."

Technology deployment across Middle Eastern healthcare

The implementation establishes new benchmarks for personalised patient experiences across the Middle East region, building upon Five Faces' established presence in Australia and international healthcare markets.

The company's technology currently serves over 4 million consumers through various public and private health systems.

King's College Hospital London in Dubai operates multiple facilities including multi-speciality medical centres in Jumeirah and Marina, specialised clinics for diabetes, endocrinology and obesity care, physiotherapy services, an aesthetics clinic, and a 100-bed tertiary hospital in Dubai Hills estate.

The partnership demonstrates healthcare providers' increasing focus on comprehensive digital transformation strategies that address patient engagement across entire care continua rather than isolated clinical encounters. This approach reflects broader industry trends towards technology-mediated healthcare delivery models that prioritise patient convenience and accessibility whilst maintaining clinical quality standards.

The King's Hub deployment represents substantial digital infrastructure investment by King's College Hospital London in Dubai, positioning the organisation at the forefront of Middle Eastern digital health innovation. MEH



Mediclinic City Hospital achieves surgical proctology excellence designation

Dubai Healthcare City's Mediclinic City Hospital has achieved international recognition as a Centre of Excellence in Surgical Proctology, becoming the latest healthcare facility to receive this prestigious designation from the Surgical Review Corporation (SRC). The announcement highlights the hospital's commitment to advanced surgical care for colorectal, anal, and pelvic floor disorders.

Historic surgeon recognition accompanies institutional achievement

The designation carries particular significance due to the parallel recognition of Dr Valentina Giaccaglia, the hospital's Deputy Medical Director and Consultant Surgeon specialising in coloproctology and pelvic floor diseases. Dr Giaccaglia has been honoured as the first female surgeon globally to receive the SRC's Surgeon of Excellence in Surgical Proctology designation, marking a historic achievement in the field.

The Centre of Excellence status reflects the integrated approach of a comprehensive multidisciplinary team comprising colorectal surgeons, gastroenterologists, radiologists, pathologists, physiotherapists, anaesthesiologists, specialised nursing staff, and administrative support personnel. This collaborative model ensures patients receive evidence-based, personalised care across the full spectrum of proctological conditions.

Healthcare ecosystem support drives clinical excellence

Allae Almanini, Chief Operating Officer of Dubai Healthcare City Authority, emphasised the strategic partnership's role in advancing healthcare standards. "We congratulate our strategic partner, Mediclinic City Hospital, for this notable rec-



Mediclinic City Hospital

ognition that underscores their persistent dedication to providing healthcare excellence and innovation," Almanini stated. The Dubai Healthcare City Authority's support framework enables healthcare partners to develop specialised services that benefit the broader UAE community.

Hospital Director David Eglington described the recognition as "a proud moment for Mediclinic City Hospital and the wider Mediclinic Middle East group," highlighting how the achievement "reflects the extraordinary commitment of Dr Valentina and our multidisciplinary team to clinical excellence and innovation, and reinforces our position as a regional leader in specialised surgical care."

Dr Giaccaglia attributed the success to sustained clinical focus, noting that "being recognised as a Centre of Excellence is the result of years of dedication to improving outcomes and quality of life for patients."

The recognition aligns with Mediclinic Middle East's broader healthcare mission within the region. As part of the Mediclinic Group, established in South Africa in 1983, the organisation operates seven



Dr. Valentina Giaccaglia, Deputy Medical Director and Consultant Surgeon expert in Coloproctology and Pelvic Floor Diseases

hospitals and 29 clinics across the UAE, maintaining over 950 inpatient beds. The group's foundation rests on applying rigorous scientific principles to patient care through state-of-the-art treatments and evidence-based clinical environments.

This designation reinforces Dubai Healthcare City's position as the region's largest healthcare ecosystem, continuing to attract international recognition for clinical excellence and specialised medical services. MEH

KFSHRC completes first robotic Ivor Lewis esophagectomy in Middle East

King Faisal Specialist Hospital and Research Centre (KFSHRC) in Riyadh has successfully performed the first robotic Ivor Lewis esophagectomy in the Middle East, marking a significant advancement in minimally invasive oncological surgery. The complex procedure was conducted on a 46-year-old male patient diagnosed with gastroesophageal junction adenocarcinoma, demonstrating the potential for robotic surgical systems to transform upper gastrointestinal cancer treatment protocols.

Enhanced surgical precision through robotic technology

The procedure, led by Dr Khalid Aldaghri, Consultant in bariatric, upper gastrointestinal, and robotic surgery at KFSHRC, utilised the technically demanding Ivor Lewis technique across two distinct surgical phases. The abdominal phase involved stomach mobilisation and gastric conduit creation, followed by thoracic phase resection of the diseased oesophagus and robotic connection of the conduit within the chest cavity.

The robotic system's advanced capabilities enabled surgeons to access deep anatomical structures without requiring large incisions, significantly enhancing surgical safety profiles whilst reducing associated

operative risks. Three-dimensional high-definition visualisation combined with stable instrument control provided superior access within confined anatomical spaces, facilitating more precise tissue dissection and better preservation of critical surrounding structures including nerves and vessels.

Accelerated patient recovery outcomes

The patient demonstrated remarkable post-operative recovery, regaining mobility within two days of surgery, initiating oral intake by day five, and achieving discharge within ten days. These outcomes represent substantial improvements compared to conventional surgical approaches, with the robotic technique demonstrating measurable benefits in pain reduction, complication minimisation, and recovery acceleration.

The precision afforded by the robotic system proved particularly advantageous during the complex anastomotic reconstruction phase, where surgical accuracy directly correlates with reduced leakage rates and improved long-term functional outcomes. The technology also reduced physical strain on the operating surgeon during the extended procedure, potentially contributing to enhanced surgical precision throughout the operation.

Multidisciplinary collaborative approach

The procedure's success was underpinned by close collaboration among surgical, anaesthesia, nursing, and technical teams working synchronously across all operative phases, from preoperative planning through postoperative recovery. This multidisciplinary approach reflects KFSHRC's established care model, designed to optimise patient outcomes whilst enhancing clinical efficiency through coordinated team-based interventions.

Expanding robotic surgery applications

This surgical milestone establishes a foundation for broader robotic surgery applications at KFSHRC, enabling more patients to benefit from advanced minimally invasive techniques.

KFSHRC's achievement comes as the institution maintains its position as the leading medical centre in the Middle East and Africa, ranking 15th globally among the world's top 250 Academic Medical Centres for 2025. The hospital was also recognised as the most valuable healthcare brand in the Kingdom and Middle East by Brand Finance in 2024, and listed among the World's Best Smart Hospitals by *Newsweek* for 2025. MEH

Saudi German Health achieves five-star recognition across multiple hospitals in Newsweek ranking

Saudi German Health (SGH) has achieved a significant milestone in healthcare excellence, with five of its hospitals in Saudi Arabia receiving five-star ratings in Newsweek's Global Hospital Rating. The facilities in Riyadh, Makkah, Madinah, Aseer, and Jeddah have all earned this prestigious recognition, positioning SGH as the healthcare group with the most five-star-rated hospitals in the Middle East and North Africa region.

Clinical excellence drives regional leadership

The achievement underscores SGH's systematic approach to maintaining high clinical standards whilst implementing innovative healthcare solutions across its network. The recognition spans geographically diverse locations, demonstrating consistent quality delivery across the Kingdom's major urban centres and regions.

This latest accomplishment builds upon SGH's earlier success in 2025, when the group received the highest number of top-ranked hospitals in the region according to Newsweek's World's Best Hospitals list.

Alignment with national healthcare transformation

The ratings align with Saudi Arabia's Vision 2030 healthcare transformation objectives, which seek to elevate the Kingdom's medical sector to global benchmarks whilst improving population health outcomes.

"We are proud to be recognised once again as the healthcare group with the highest number of five-star-rated hospitals in the region," said Makarem Sobhi Batterjee, Vice Chairman of Saudi German Health. "This achievement is a testament to our dedication to clinical excellence, innovation, and exceptional service." MEH



Informa consolidates Dubai healthcare events to create world's largest medical exhibition

Informa has announced plans to simultaneously host two flagship healthcare events in Dubai during February 2026, creating what the company describes as the world's largest healthcare exhibition. The strategic consolidation of WHX Dubai (formerly Arab Health) and WHX Labs Dubai (previously Medlab Middle East) will transform the emirate into a comprehensive global healthcare expo hub.

Five-day medical convergence targets substantial economic impact

Running from 9-13 February 2026, the combined events are projected to attract more than 270,000 healthcare professionals alongside over 4,800 exhibitors. This represents a significant expansion from individual event attendance figures, with organisers anticipating substantial business generation based on previous performance metrics.

The 50th edition of WHX Dubai, held

earlier this year, generated a record-breaking \$2.57 billion in business value, with each exhibitor experiencing an average impact of \$2.14 million. Meanwhile, WHX Labs Dubai produced \$621 million in business transactions during its most recent iteration.

Venue distribution spans Dubai's exhibition infrastructure

For the first time in its 50-year history, WHX Dubai will relocate from Dubai World Trade Centre to the Dubai Exhibition Centre in Expo City Dubai, running from 9-12 February. The event will feature nine product sectors encompassing medical devices, imaging, diagnostics, and healthcare infrastructure.

Concurrently, WHX Labs Dubai will celebrate its 25th anniversary at the Dubai World Trade Centre from 10-13 February, focusing on laboratory innovation, diagnostics, and precision medicine through eight specialised product pillars.

Educational programme expands with specialised conferences

The 2026 programme introduces significant educational enhancements, including seven CME-accredited conferences for WHX Dubai featuring over 250 speakers. New additions include four certified boot camps and three dedicated presentation stages focusing on emerging technologies, scientific advancement, and industry leadership.

WHX Labs Dubai will host the 25th Annual Laboratory Management and Medicine Congress alongside two new clinician conferences: the Precision Health Global Forum and the Antimicrobial Resistance Leadership Global Summit.

Solenne Singer, Senior Vice President at Informa Markets, said: "Dubai's unique position will enable bold ideas and breakthroughs to cross borders rapidly, accelerating the spread of solutions from one market to another whilst reinforcing the UAE's status as an international centre for healthcare transformation." MEH

Thumbay Group launches AED 3 million research grant to advance global medical innovation

Gulf Medical University (GMU), the academic flagship of Thumbay Group, has announced the launch of its Second Cycle Thumbay International Research Grant for 2025/26, allocating AED 3 million (about US\$816,000) to support transformative medical research initiatives across critical healthcare domains.

The comprehensive funding programme invites global researchers to submit proposals addressing key areas including precision oncology, drug discovery, artificial intelligence applications in medicine, public health, healthcare systems and health economics, veterinary medicine, and medical education innovation. The initiative emphasises evidence-based methodology and interdisciplinary collaboration approaches.

Strategic focus on translational research impact

The grant framework prioritises research proposals that demonstrate

clear pathways from laboratory discovery to clinical application and community implementation. This translational approach reflects GMU's commitment to ensuring scientific advancement directly influences patient outcomes and healthcare delivery systems.

Dr Thumbay Moideen, Founder President of Thumbay Group, outlined the programme's ambitious scope: "Through this grant, we are investing to make Gulf Medical University a leading research-based university and United Arab Emirates to be a Hub for research and innovation. In the next two years, we hope to increase the Grant amount to AED 10 million."

Professor Manda Venkatramana, Acting Chancellor at GMU, commented: "Our goal is to create an ecosystem where research is not confined to the lab but extended into clinics and communities, making an impact on patient outcomes. With over 100 leading indus-

try partners, GMU is proud to serve as the launchpad for innovation with purpose."

International research collaboration

GMU's established global network includes partnerships with more than 60 universities worldwide and representation from over 90 nationalities across its campus. This international foundation supports the grant programme's objective to facilitate cross-border research collaboration and knowledge exchange.

Application process and timeline

Research proposals must be submitted by 30 November 2025, with detailed application information available through GMU's official website at: www.gmu.ac.ae. The programme welcomes submissions from researchers worldwide, reflecting the university's commitment to fostering international scientific collaboration and innovation. MEM



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Medical research news from around the world

Beta-blocker standard of care challenged by landmark heart attack trial

A major international clinical trial has overturned four decades of standard cardiac care, finding that beta-blockers provide no benefit for most heart attack survivors with preserved heart function. The REBOOT study, involving over 8,500 patients, could reshape treatment guidelines worldwide.

The REBOOT clinical trial has delivered a seismic shift to cardiovascular medicine, challenging one of its most entrenched treatment paradigms. This landmark study, coordinated by Spain's Centro Nacional de Investigaciones Cardiovasculares (CNIC), found that beta-blockers – routinely prescribed to heart attack patients for over 40 years – offer no clinical benefit for those with uncomplicated myocardial infarction.

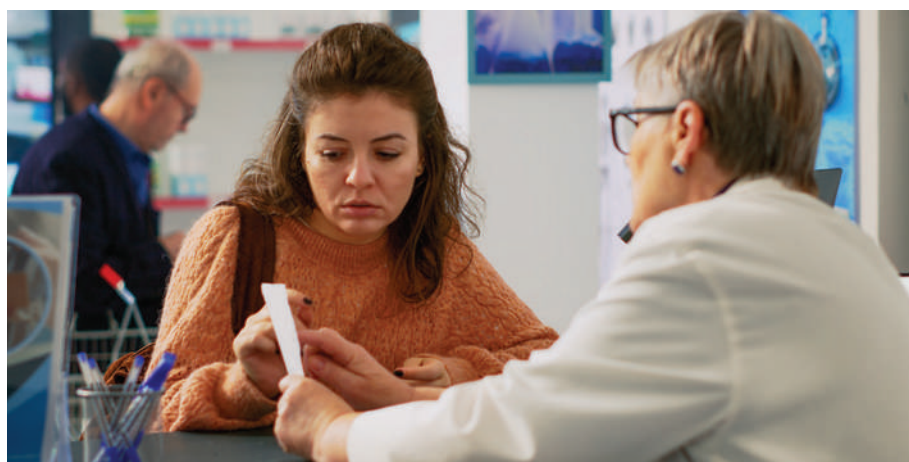
The findings, published simultaneously in *The New England Journal of Medicine* and *The Lancet* on 30 August 2025, emerged from the largest trial ever conducted on this question. Researchers enrolled 8,505 patients across 109 hospitals in Spain and Italy, following them for nearly four years after their heart attacks.

Most patients show no benefit from standard treatment

The trial focused on patients whose heart attacks left their cardiac function relatively intact – specifically those with left ventricular ejection fractions above 40%. This represents the vast majority of modern heart attack survivors, as improved emergency cardiac care means approximately 70% now survive with preserved heart function.

“REBOOT will change clinical practice worldwide,” said principal investigator Dr Borja Ibáñez, CNIC Scientific Director and cardiologist at Hospital Universitario Fundación Jiménez Díaz. “Currently, more than 80% of patients with uncomplicated myocardial infarction are discharged on beta-blockers. The REBOOT findings represent one of the most significant advances in heart attack treatment in decades.”

The study revealed no significant differences between patients who received beta-blockers and those who didn't in rates of death, recurrent heart attack, or hospi-



talisation for heart failure. This null result challenges decades of clinical practice based on earlier studies conducted when cardiac care was less advanced.

Subgroup analysis reveals crucial distinctions

However, the research uncovered important nuances through detailed subgroup analysis. While patients with fully preserved heart function (ejection fraction above 50%) showed no benefit from beta-blockers, those with moderately reduced function (40-50%) appeared to derive some advantage.

To investigate this finding further, the researchers conducted a meta-analysis with other trials, published in *The Lancet*. This confirmed that beta-blockers significantly reduce risks of death, recurrent heart attack, or heart failure only in patients with moderately reduced cardiac contractile function.

“Taken together, these two studies provide compelling evidence that post-infarction patients with fully preserved contractile function do not benefit from beta-blockers, whereas those with moderate or greater dysfunction do,” explained Dr Xavier Rosselló, CNIC scientist and

cardiologist at University Hospital Son Espases in Mallorca.

Clinical context drives paradigm shift

The timing of this research reflects fundamental changes in cardiac care since beta-blockers first showed benefit in the 1980s. Modern treatment involves systematic, rapid reopening of blocked coronary arteries, dramatically reducing complications like dangerous heart rhythms that beta-blockers were originally intended to prevent.

“Today, occluded coronary arteries are systematically reopened rapidly, drastically lowering the risk of serious complications such as arrhythmias,” noted Dr Ibáñez. “In this new context, where the extent of heart damage is smaller, the need for beta-blockers is unclear.”

The implications extend beyond efficacy to patient quality of life. Beta-blockers, whilst generally safe, can cause side effects including fatigue, bradycardia, and sexual dysfunction. Eliminating unnecessary prescriptions could improve patient adherence to essential medications whilst reducing adverse effects.

European research collaboration sets new standards

REBOOT demonstrated the power of academic-led research free from commercial



influence. More than 500 researchers from Spain and Italy participated voluntarily, with the study funded entirely by public institutions including CNIC, the Spanish Society of Cardiology, and CIBERCV.

“The trial was designed to optimise heart attack care based on solid scientific evidence and without commercial bias,” emphasised Dr Ibáñez. “These results will help

simplify and streamline treatment, reduce adverse effects, and improve the quality of life for thousands of patients every year.”

The research affects millions of patients annually. More than two million Europeans suffer heart attacks each year, including around 70,000 in Spain alone. Until now, the majority were discharged with beta-blocker prescriptions – a prac-

tice now fundamentally questioned.

Dr Valentín Fuster, CNIC General Director and senior REBOOT investigator, placed the findings in broader context: “This trial will reshape all international clinical guidelines. It joins other landmark trials led by CNIC that have already transformed the global approach to cardiovascular disease.” MEH

Reference:

REBOOT Trial Investigators. (2025). Treatment with Beta-Blockers after Myocardial Infarction without Reduced Ejection Fraction. *The New England Journal of Medicine*. doi: <https://doi.org/10.1056/NEJMoa2504735>

Pioneering study finds myocardial infarction may result from bacterial infections

Finnish and UK researchers have demonstrated that heart attacks may result from bacterial infections hiding within cholesterol-laden arterial plaques. The groundbreaking study challenges conventional understanding of cardiac pathology and opens possibilities for vaccine development and novel therapeutic approaches targeting dormant bacterial communities in coronary arteries.

Myocardial infarction may fundamentally represent an infectious disease rather than purely a cholesterol-driven pathological process, according to pioneering research published in the *Journal of the American Heart Association* on 6 August 2025.

The international study, led by Professor Pekka Karhunen from Tampere University, provides the first compelling evidence that bacterial biofilms residing within atherosclerotic plaques could trigger fatal heart attacks. This discovery fundamentally challenges current medical understanding and suggests entirely new avenues for prevention and treatment.

Hidden bacterial communities discovered

Using advanced molecular techniques and immunohistochemistry, researchers analysed coronary plaques from 121 sudden death victims and 96 surgical patients undergoing arterial procedures. Their findings revealed that viridans group streptococcal DNA was found in 42.1% of coronary plaques and 42.9% of endarterectomy samples.

The study's most striking discovery centres on bacterial immune evasion. Viridans streptococci colonised the core of atherosclerotic plaques as biofilms unrecognised by immune system macrophages, whilst simultaneously dispersed bacteria infiltrated ruptured fibrous caps, readily detected by immune cells.

“Bacterial involvement in coronary artery disease has long been suspected, but direct and convincing evidence has been lacking. Our study demonstrated the presence of genetic material from several oral bacteria inside atherosclerotic plaques,” Karhunen explains.

Clinical significance and therapeutic potential

Bacterial immunopositivity demonstrated

strong associations with disease severity and clinical outcomes, correlating significantly with severe atherosclerosis and death from coronary heart disease. Genome-wide expression analysis revealed substantial upregulation of bacterial recognition pathways, supporting active bacterial-host interactions within diseased arterial tissue.

The findings suggest that viral infections or other external triggers may activate dormant biofilms, leading to bacterial proliferation and inflammatory responses that ultimately cause plaque rupture and thrombosis formation.

“The observations pave the way for the development of novel diagnostic and therapeutic strategies for myocardial infarction. Furthermore, they advance the possibility of preventing coronary artery disease and myocardial infarction by vaccination,” the researchers note.

This research represents a paradigm shift in understanding myocardial infarction pathogenesis and may herald a new era of infection-focused cardiac therapeutics. MEH

Reference:

Karhunen, P. J., Pessi, T., Hörkkö, S., et. al. (2025). Viridans Streptococcal Biofilm Evades Immune Detection and Contributes to Inflammation and Rupture of Atherosclerotic Plaques. *Journal of the American Heart Association*, 14, e041521. <https://doi.org/10.1161/JAHA.125.041521>

Setting New Standards in Gastroenterology & Endoscopy with Medcare Royal Speciality Hospital



In the evolving landscape of modern medicine, gastroenterology is experiencing a quiet revolution. No longer confined to reactive diagnostics, it now stands at the forefront of proactive, precision-guided care. At the heart of this shift in the region is **Medcare Royal Speciality Hospital's newly launched Advanced Endoscopy and Gastroenterology Centre**, a facility built to set new standards in minimally invasive gastrointestinal care.

This isn't simply the addition of a new clinical unit. It's the realization of a forward-thinking vision that combines world-class technology with sub-specialist expertise to transform outcomes for patients across the region.

Endoscopy, Reimagined

Once viewed as a last-resort diagnostic tool, endoscopy is now central to early detection, intervention, and even prevention. The Centre at Medcare Royal Speciality Hospital is equipped with the latest generation of endoscopic platforms with ultra-HD imaging, narrow-band technology, and AI-assisted detection systems, allowing clinicians to identify lesions and pathology at their earliest stages, with remarkable clarity and confidence.

Advanced techniques in the field of third space endoscopy such as EUS (Endoscopic Ultrasound), POEM (Peroral Endoscopic Myotomy), G-POEM, and submucosal dissection are not only available, but routinely performed by a team of highly trained gastroenterology specialists. These procedures offer patients a non-surgical alternative for conditions that once required open or laparoscopic intervention, significantly reducing recovery time, risk, and overall burden of care.

An Expert-Led, Patient-Focused Model

Innovation is more than just instrumentation. The patient journey has been thoughtfully redefined at Medcare Royal Speciality Hospital, from streamlined admissions to fully private recovery suites and personalized sedation protocols. Every aspect of the Centre's design reflects a commitment to comfort, dignity, and clinical excellence.

At the core of the Centre is a team of gastroenterologists whose diverse subspecialty expertise spans inflammatory bowel diseases, celiac disease, and complex pancreaticobiliary disorders. Leading this team is Prof. Dr. Mohammed Abdelhafez, a regional authority in advanced interventional endoscopy, whose expertise in third space procedures such as POEM, G-POEM, and submucosal dissection ensures patients benefit from the highest standard of care. Together, the Centre's specialists combine technical mastery with a collaborative, multidisciplinary approach to every case.

Responding to a Regional Imperative

Across the Middle East, rates of gastrointestinal diseases, many of which are lifestyle-related, are on the rise. Reflux, fatty liver disease, and colorectal cancer are increasingly common, and early detection is more vital than ever. Medcare's new centre is responding proactively, offering evidence-based screening programmes, public education initiatives, and structured care pathways that promote prevention and early diagnosis.

Investing in the Future of Gastroenterology

A key differentiator of Medcare's Advanced



Endoscopy and Gastroenterology Centre is its commitment to clinical education, particularly in the highly specialised field of third space endoscopy. Prof. Dr. Mohammed Abdelhafez trains fellow gastroenterologists in complex endoscopic procedures, fostering the next generation of specialists while maintaining excellence in patient care.

This combination of high-end technology, top-tier talent, and clinical vision positions Medcare Royal Speciality Hospital as a leader in next-generation gastrointestinal medicine.

A New Era in Digestive Health

The Advanced Endoscopy and Gastroenterology Centre at Medcare is more than a facility; it is a statement of clinical intent. It signals a new era where digestive health is managed with foresight, finesse, and compassion. For referring physicians, it offers reassurance of true specialist care. For patients, it promises something even more valuable: the confidence that they are in expert hands, from diagnosis to recovery. **MEH**

Contact Medcare

• Call: 800MEDCARE

• Visit: <https://www.medcare.ae/en/royal-advanced-endoscopy-gastroenterology-center>

Leading Swiss medicine for children

University Children's Hospital Zurich
– World-class paediatrics in a unique healing environment



At its new and pioneering location, the University Children's Hospital Zurich combines clinical excellence with innovative research, international standing – and an environment in which children and families feel safe and secure.

If a child becomes seriously ill, they need a place that combines first-rate medical treatment with a human connection. The University Children's Hospital Zurich is the largest paediatric hospital in Switzerland and one of the world's leading centres. At its new campus, it sets pioneering standards in treating and caring for young patients from both Switzerland and abroad.

A comprehensive centre for paediatrics

The Children's Hospital moved into its state-of-the-art new building in the autumn of 2024. Two buildings – an acute care hospital and a research and teaching centre – are situated opposite each other, and together form a unique comprehensive centre for paediatric medicine. The architecture creates light, calm and clarity; family-friendly single rooms with parents' beds allow for closeness, even in difficult times. The modern infrastructure and digital processes improve the quality of medical care and strengthen interdisciplinary collaboration in the daily clinical practice.

Research that makes a difference

Innovative treatments come into being when science and clinical practice work hand in hand. At the Children's Hospital Zurich, this degree of proximity is physically palpable: at the purpose-built research centre, biologists, medical teams and data analysts work closely together. The focus is on areas such as neurodevelopment, immuno-oncology, and regenerative medicine – topics that are also of key importance for rare or genetic diseases. Research findings flow directly into the care, allowing for

personalised treatments which are based on the latest findings.

EEG and neurosurgery

The Children's Hospital Zurich has the largest epilepsy programme for children in Switzerland. High-tech procedures such as stereo EEG, robot-assisted laser ablation and minimally invasive surgeries allow for precise intervention. The range of treatments is complemented by comprehensive neurosurgical expertise – in rare vascular diseases of the brain such as Moyamoya syndrome, for example.

Oncology and neuro-oncology

The Interdisciplinary Centre for Paediatric Oncology supports children with cancer and brain tumours throughout their treatment. Precision medicine makes it possible to identify the active agents which are promising for each individual child. International study opportunities and collaborations with proton therapy centres open up additional opportunities.

Stem cell transplantation

The largest paediatric stem cell transplant programme in Switzerland is one of the safest in Europe. Around 35 allogeneic transplants are performed annually – with the use of particularly gentle methods which reduce the risk of complications.

Fetal Surgery

Even before birth, certain congenital conditions can be treated in the womb. In this highly specialised field, the Children's Hospital Zurich ranks among the world's leading centres.

Visceral and Thoracic Surgery

The Children's Hospital offers highly specialised expertise in visceral and thoracic surgery. Its modern, interdisciplinary approach treats malformations, tumours and developmental disorders in patients ranging from newborns to adolescents. The goal is always to deliver optimal treatment that sustainably improves each child's quality of life.

Personal support for international families

The Children's Hospital's International Office provides support to families from abroad from initial contact to follow-up care. The team assists with visas, appointment scheduling, translation services (including Arabic), and finding suitable accommodation near the clinic. Cultural or religious needs are also taken into account – with the consistent goal of making each stay as pleasant and well-organised as possible. MEH

How to find the University Children's Hospital Zurich

- Send medical documents in English and, if available, imaging files to international@kispi.uzh.ch or call +41 44 249 28 28.
- You will receive a specialist assessment and a transparent overview of costs.
- The International Office provides support with visas, travel, and accommodation.
- An experienced team will welcome you on site, plan your treatment individually and support you throughout your stay.

A tradition of care and excellence

Now in its third year, the annual alumni-led **Updates in Primary Care Conference** has quickly become established as a major event in the calendar of **Weill Cornell Medicine-Qatar (WCM-Q)**. This year's edition, due to be held December 5-6 in Doha, has once again been carefully designed to showcase the latest evidence-based best practices for managing common adult conditions in primary care, with a focus on Qatar's healthcare landscape. The conference builds upon and exemplifies WCM-Q's traditional commitment to the pursuit of excellence in healthcare, education and research.

Aimed at family physicians, general practitioners and primary care doctors in Qatar, the two-day conference offers a unique opportunity for professional development and networking with both national and international experts. The event is coordinated by the Division of Continuing Professional Development (CPD) at WCM-Q.

This year's event is titled **Updates in Primary Care: Specialist-Led Case-Based Discussions Highlighting the Latest Evidence and Best Clinical Practices**. The WCM-Q alumni who are jointly organizing the conference are Dr. Mahrukh Rizvi, Dr. Tariq Chukir, Dr. Reshma Bholah, Dr. Tania Jaber and Dr. Muneera Al-Muhannadi. Middle East Health met with these four members of the WCM-Q alumni community to discuss the conference's goals, impact, and role in the pursuit of excellence in healthcare in the region.

Dr. Mahrukh Rizvi graduated from WCM-Q in 2011. She completed her residency training in internal medicine at Rochester General Hospital in New York, followed by fellowships in nephrology and critical care at the University of Rochester Medi-

cal Center and Mayo Clinic, Rochester, respectively, before returning to WCM-Q to join the faculty in 2021, where she now holds the position of assistant professor of medicine. She is also a consultant in the Medical Intensive Care Unit at Hamad Medical Corporation (HMC).

For Dr. Rizvi, co-directing the conference represents a way to help fulfil a core element of WCM-Q's overall mission. She explained: "At the heart of WCM-Q's institutional ethos is a firm commitment to not only attain excellence in medical education but also to make very meaningful contributions to enhancing patient care in Qatar through strong engagement with practicing healthcare professionals. The Updates in Primary Care Conference has become a superb vehicle for sharing and discussing the latest updates with the wider healthcare community, helping us to encourage implementation of the most up-to-date evidence-based best practices that can drive improvements in patient care. We are thrilled that the conference has been extremely well-subscribed since the moment we launched it – the reaction from local healthcare professionals has been incredibly pro-active and enthusiastic."

Dr. Tariq Chukir is a member of WCM-Q's Class of 2015. He completed his residency training in internal medicine at New York-Presbyterian Hospital/Weill Cornell Medical Center (NYPH-WCM) and a fellowship in endocrinology, diabetes, and metabolism at NYPH-WCM. Dr. Chukir returned to WCM-Q in 2020 and is now assistant professor of medicine and an endocrinology consultant at the Qatar Metabolic Institute at HMC, and at Sidra Medicine. Hailing the positive impact of the UPCC, Dr. Chukir said: "One of the best things about the success of the conference is the level of engagement it generates among healthcare professionals in Qatar. We feel a very strong sense of community and shared mission, which has a huge practical effect because it facilitates collaboration, knowledge exchange and very deep and productive discussions about important developments in best practice. We feel that being part of such a community is of great benefit to healthcare professionals striving for continual improvement in the delivery of primary care."

The conference schedule features a variety of session formats, including specialist-led case discussions, panels, and



Dr. Mahrukh Rizvi



Dr. Tariq Chukir



Dr. Reshma Bholah



Dr. Tania Jaber



Dr. Muneera Al-Muhannadi

interactive roundtables, as well as offering opportunities for networking with both national and international experts. The format of each session has been designed to bring together physicians, general practitioners, and primary care doctors for detailed case-based discussions on a variety of topics, all of which are firmly grounded in the latest clinical evidence.

Dr. Reshma Bholah graduated from WCM-Q in 2011 before going on to complete her residency in pediatrics in 2015 and her sub-specialty training in pediatric nephrology in 2018 at Virginia Commonwealth University in Richmond, Virginia. She is currently assistant professor of pediatrics at WCM-Q and a pediatric nephrologist at Sidra Medicine. Dr. Bholah said: “As an alumna of WCM-Q I feel very grateful to be able to share knowledge I have gained from training in Qatar and the United States with fellow physicians, and to be able to learn from their experiences, too. The UPCC provides an extremely effective platform through which we can all grow together, becoming better physicians providing continually improving care to our patients.”

Dr. Tania Jaber of the Class of 2011 completed an internal medicine residency at Cleveland Clinic Foundation in Ohio, followed by a fellowship in endocrinology, diabetes, and metabolism at The University of Texas Health Science Center in Houston. Dr. Jaber is now a consultant

endocrinologist at Hamad Medical Corporation and assistant professor of clinical medicine at WCM-Q. Explaining the desired outcomes of the conference, she said: “The conference has two principle learning objectives. The first is to review the clinical presentation, diagnosis, and updated evidence-based management of adult conditions commonly encountered in primary care, taking into account the local healthcare context in Qatar. The second is for participants to identify pharmacologic and non-pharmacologic resources and referral pathways available in Qatar, which will enable them to improve their understanding of the most effective ways to utilize these resources in their clinical practice and therefore provide the best care possible to their patients.”

Dr. Muneera Al-Muhannadi of the Class of 2009 was certified as a family medicine

physician by the Arab Board of Health Specializations (ABHS) in 2016. She is now assistant professor of family medicine in clinical medicine at the Primary Health Care Corporation. Dr. Al-Muhannadi said: “The UPCC has become an important and valuable platform for providing support to primary care physicians in Qatar and the wider region as they seek to continually enhance their skills in order to best serve their patients. We are excited to consolidate and build on this success at the forthcoming third edition of the conference in December this year.”

Abstract submissions invited

The organizing committee of the conference has invited abstract submissions for poster presentations focused on outpatient medicine, with an emphasis on relevance to primary care practice in Qatar and the region. MEH

For more information, and to register to attend, visit: <https://qatar-weill.cornell.edu/event/alumni-conference/overview>.



AI scribes slash physician burnout by more than 20% in landmark multicentre study

Ambient documentation technologies that record patient visits and draft clinical notes led to significant reductions in physician burnout and improvements in well-being, according to a Mass General Brigham-led study of two large healthcare systems involving more than 1,400 physicians and advanced practice providers.

A groundbreaking study published in *JAMA Network Open* on 21 August 2025 has demonstrated that artificial intelligence-driven ambient documentation technology (ADT) can dramatically reduce physician burnout whilst restoring professional satisfaction in clinical practice. The research, conducted across Mass General Brigham in Massachusetts and Emory Healthcare in Atlanta, represents the largest multicentre evaluation of AI scribes to date.

The study found that at Mass General Brigham, ADT use was associated with a 21.2% absolute reduction in burnout prevalence at 84 days, while Emory Healthcare saw a 30.7% absolute increase in documentation-related wellbeing at 60 days. These results suggest a transformative potential for addressing one of healthcare's most pressing challenges.

Tackling the documentation crisis

Physician burnout affects more than 50% of US doctors and has been linked to time spent on electronic health records, particularly after hours. The burden of clinical documentation has become a primary driver of professional dissatisfaction, with clinicians spending substantial time outside working hours completing patient notes.

Ambient documentation technology listens to a clinician-patient conversation and drafts a structured note using generative AI. Unlike traditional dictation software or virtual scribes, these systems work silently in the background, capturing the nuances of patient encounters and automatically generating comprehensive clinical documentation for physician review.

Dr Rebecca Mishuris, chief medical information officer at Mass General Brigham and study co-senior author,

emphasised the technology's impact: "Ambient documentation technology has been truly transformative in freeing up physicians from their keyboards to have more face-to-face interaction with their patients. Our physicians tell us that they have their nights and weekends back and have rediscovered their joy of practicing medicine. There is literally no other intervention in our field that impacts burnout to this extent."

Comprehensive evaluation across specialties

The study included 1,430 clinicians across both healthcare systems, with 873 at Mass General Brigham and 557 at Emory Healthcare. Participants spanned multiple specialties, including primary care, surgery, emergency medicine, and various subspecialties, providing broad insights into ADT's effectiveness across diverse clinical settings.

At Mass General Brigham, approximately equal proportions of clinicians practised in primary care (22.0%) compared to Emory (28.0%), with the majority being physicians (78.8% at MGB and 75.0% at Emory). The diversity of participants strengthens the generalisability of the findings across different healthcare contexts.

Significant burnout reduction documented

The proportion of Mass General Brigham clinicians reporting burnout decreased from 50.6% to 29.4% at 42 days and from 52.6% to 30.7% at 84 days. This dramatic improvement was measured using the Professional Fulfillment Index, a validated instrument for assessing physician wellbeing.

At Emory Healthcare, the proportion of clinicians reporting a positive impact

of their documentation practice on wellbeing improved from 1.6% to 32.3%. This substantial shift indicates that ADT not only reduces negative experiences but actively enhances professional satisfaction.

Real-world implementation insights

Approximately 128 of 264 Mass General Brigham survey respondents (48.5%) reported using ADT for at least 50% of their patient visits, while 27 of 62 Emory respondents (43.5%) reported usage for most or all of their visits. These utilisation rates suggest that while many clinicians found significant value in the technology, adoption patterns varied based on clinical context and visit types.

Both institutions reported median likelihood-to-recommend scores of 8.0 out of 10, indicating high user satisfaction despite varying usage patterns. This suggests that even partial implementation can yield meaningful benefits for clinician experience.

Qualitative benefits emerge from user feedback

The study's qualitative analysis revealed profound impacts on clinical practice. Qualitative feedback from users highlighted that ambient documentation enabled more "contact with patients and families," improvements in their "joy in practice," whilst recognising its potential to "fundamentally change the experience of being a physician."

One physician noted the technology's transformative effect: "It definitely improves my joy in practice because I get to interact with patients and look them in the eye without worrying I will forget what they are saying later. As the tools grow, I think they will fundamentally change the experience of being a physician."



hospitals nationwide are looking to tackle, and ambient documentation provides a scalable technology worth further study.”

Implications for healthcare transformation

The authors concluded that “across the survey studies at two academic medical centres, ADT was associated with significant reductions in burnout and improvements in perceived documentation-related wellbeing.” This represents the strongest evidence to date that AI-powered documentation tools can meaningfully address physician burnout at scale.

The programme will expand to other healthcare professionals such as nurses, physical and occupational therapists, and speech-language pathologists later this year. This broader implementation suggests potential system-wide transformation in healthcare documentation practices.

The study provides compelling evidence that ambient documentation technology offers a practical solution to one of healthcare’s most persistent challenges, potentially marking a turning point in efforts to restore physician wellbeing and professional satisfaction. MEH

Challenges and limitations identified

However, some users felt it added time to their note-writing or had less utility for certain visit types or medical specialties. The research identified particular challenges with paediatric physical examinations and psychiatry visits, where the current AI models struggled to capture specialty-specific nuances effectively.

The study authors acknowledged several limitations, including the voluntary nature of both institutions’ pilots, potential selection bias towards enthusiastic users, and limited survey response rates. These factors suggest the findings may represent a best-case scenario for ADT implementation.

Future directions and scaling potential

Mass General Brigham’s ambient documentation programme launched in July 2023 as a proof-of-concept pilot study involving 18 physicians. By July 2024, the pilot expanded to more than 800 providers, and as of April 2025, the technologies have been made available to all Mass General Brigham physicians, with more than 3,000 providers routinely using the tools.

Dr Lisa Rotenstein, co-senior study author and director of The Center for Physician Experience and Practice Excellence at Brigham and Women’s Hospital, highlighted the broader implications: “This is an issue that

Reference:

You, J. G., Dbouk, R. H., Landman, A., et. al. (2025). Ambient documentation technology in clinician experience of documentation burden and burnout. *JAMA Network Open*, 8(8), e2528056. doi: <https://doi.org/10.1001/jamanetworkopen.2025.28056>

AI copilot dramatically reduces clinical errors in Kenya primary care study

A groundbreaking study of nearly 40,000 patient visits across 15 clinics in Nairobi has demonstrated that an AI-powered clinical decision support system can significantly reduce diagnostic and treatment errors in real-world primary care settings, marking a crucial development in bridging the gap between AI capabilities and practical healthcare implementation.

The research, conducted in partnership between Penda Health and OpenAI, found that clinicians using the AI Consult system experienced a 16% relative reduction in diagnostic errors and a 13% reduction in treatment errors compared to their colleagues working without the technology. The findings represent one of the first large-scale demonstrations of AI clinical

decision support delivering measurable improvements in live patient care.

Real-world testing reveals substantial impact

The quality improvement study, approved by Kenya’s Ministry of Health, Digital Health Agency, and AMREF Health Africa Ethical and Scientific Review Committee,

analysed 39,849 patient visits performed by 106 clinicians across Penda Health’s network of primary care centres. Unlike previous AI evaluations conducted in controlled environments, this research captured the unique challenges of real-world implementation in a busy clinical setting.

The AI Consult system functions as a continuous safety net, running silently in



the background during patient encounters and providing feedback through a traffic-light interface: green for no concerns, yellow for moderate issues requiring attention, and red for safety-critical problems requiring immediate clinician review.

“Closing the model-implementation gap will require coordinated effort across the health AI ecosystem, including rigorous evaluation and iterative deployment in clinical settings,” the researchers noted, highlighting the critical importance of studying AI tools in authentic healthcare environments rather than simulated conditions.

Comprehensive error reduction across clinical domains

The study’s impact extended across multiple aspects of clinical care. Independent physician raters evaluating clinical documentation found significant reductions in error rates: 32% for history-taking errors, 10% for investigation errors, 16% for diagnostic errors, and 13% for treatment errors.

The number needed to treat was particularly impressive, with 18.1 patients requiring exposure to prevent one diagnostic error and 13.9 patients to prevent one treatment error. In absolute terms, the researchers calculated that “the introduction of AI Consult would avert diagnostic errors in 22,000 visits and treatment errors in 29,000 visits annually at Penda alone.”

The AI system proved particularly effective in preventing common clinical failures. Clinicians using AI Consult were less likely to miss key details in patient histories, overlook important investigations, make incorrect primary diagnoses, prescribe inappropriate medications, or omit essential patient education.

Three pillars of successful implementation

The researchers identified three critical factors for the system’s success: capable AI models, clinically-aligned implementation, and active deployment strategies.

The implementation design proved crucial to user adoption. Penda’s previous iteration of AI Consult achieved limited uptake because it required clinicians to actively request help and interrupted patient interactions. The successful version studied integrated

seamlessly into existing workflows, automatically triggering at key decision points without disrupting clinical care.

“Active deployment was another key factor for the success of AI Consult. The tool had a significantly greater effect during the main study period (when active deployment strategies were employed) compared to the induction period,” the authors reported.

The deployment strategy encompassed three elements: connection (peer champions explaining the system’s value), measurement (tracking clinician engagement), and incentives (recognising successful adoption). During the induction period, the “left in red rate” – visits where critical alerts remained unaddressed – was similar between AI and non-AI groups at 35-40%. Following active deployment, this rate dropped to 20% in the AI group while remaining at 40% in the control group.

Unexpected learning effects emerge

Beyond immediate error reduction, the study revealed that AI Consult appeared to enhance clinicians’ skills over time. The proportion of visits that “started red” – indicating clinicians made initial errors before receiving AI feedback – fell from 45% to 35% during the study period in the AI group, whilst remaining steady at 45-50% in the control group.

“This suggests that AI Consult is training clinicians to avoid common mistakes even prior to AI Consult alerts,” the researchers observed. This learning effect was evident across different clinical domains, indicating broad skill development rather than narrow protocol adherence.

Clinician feedback supported these observations. All survey respondents in the AI group reported that AI Consult improved care quality, with 75% describing the effect as “substantial”. Qualitative responses described the system as “a consultant in the room” and “one of the best innovations to happen at Penda.”

Technical validation through multiple assessment methods

The research employed rigorous evaluation

methods, including independent physician reviewers and AI-based assessment systems. A panel of 108 physicians, including 29 from Kenya, rated randomly selected visits across four clinical domains: history and examination, investigations, diagnosis, and treatment.

Interestingly, when large language models were used to evaluate the same clinical documentation, they showed greater agreement with human physicians than physicians showed amongst themselves. Both GPT-4.1 and o3 models found larger effect sizes for AI Consult than human physician raters, suggesting that LLM-based evaluation might offer scalable quality assessment methods for healthcare systems.

Patient safety improvements documented

Analysis of patient safety reports revealed that AI Consult had clear potential to reduce patient harm. In half of the reviewed reports, harm might have been prevented if AI Consult guidance had been available and followed. Critically, the study found no cases where AI Consult recommendations actively caused harm.

Patient-reported outcomes showed trends towards improvement, though statistical significance was not achieved. The rate of patients reporting feeling unwell eight days after treatment was 3.8% in the AI group compared to 4.3% in the control group.

Global implications for healthcare AI

The study’s significance extends beyond its immediate clinical findings. “With advancements in model capabilities, closing the model-implementation gap has become the most important challenge for the health AI ecosystem,” the researchers emphasised.

The research provides a practical framework for healthcare systems worldwide considering AI implementation. MEH

Reference:

Korom, R., Kiptinness, S., Adan, N., et. al. (2025). *AI-based clinical decision support for primary care: A real-world study*. Penda Health & OpenAI. <https://doi.org/10.48550/arXiv.2507.16947>



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Wael Al-Delaimy, MD, PhD | M. Rami Alfarra, PhD | Hanadi Al-Thani, PhD | Dietrich Busselberg, PhD |
Bassel Daher, PhD | Omar Hahad, PhD | Jonathan Newman, MD | Ali Saad, MD

Learning Objectives

1. Describe the health impacts of climate change and environmental stressors, with a focus on challenges in the MENA region.
2. Recognize the role of healthcare systems and policies in contributing to and mitigating environmental harm.
3. Apply environmental health to clinical, research, and policy decision-making.
4. Evaluate systems-level strategies for climate resilience, including sustainable urban design and infrastructure.
5. Apply interdisciplinary approaches to address climate-health challenges and promote equity through collaboration and community engagement.

Who Should Attend:

Physicians, nurses, dentists, allied health professionals, pharmacists, public health experts, academics, students, and researchers interested in environmental health, climate change, and healthcare sustainability.



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AI and robotics in healthcare: Inside Cleveland Clinic Abu Dhabi's quiet revolution



In a surgical suite in Abu Dhabi, a patient with prostate cancer recently underwent an operation guided in real time by a colleague thousands of miles away in the United States. This first-ever transcontinental robotic-assisted focal therapy procedure was completed in less than an hour. It showcased how robotics and digital connectivity are redefining healthcare, erasing borders in medicine, and redefining what is possible for patients.

At the forefront of this transformation is Cleveland Clinic Abu Dhabi. In just a decade, the hospital, ranked on *Newsweek's* "World's Best Hospitals" and "Best Smart Hospitals" lists for four consecutive years, has become a proving ground for advanced technologies that are redefining care in the Middle East and attracting global attention.

Key to this progress are collaborations with local and global partners. The hospital is piloting predictive AI models that anticipate medical challenges before they arise and testing next-generation robotic systems designed for increasingly complex procedures. By integrating these advances locally, Abu Dhabi is positioning itself as a hub for healthcare innovation, attracting patients from all over the world.

Breaking ground with robotics

Robotic-assisted surgery has been part of the hospital's DNA from the start. Since 2015, Cleveland Clinic Abu Dhabi's Robotic Surgery Program has performed over 1,100 procedures, achieving a series of firsts such as the UAE's first robotic bilateral kidney transplant from a deceased donor, the Gulf's first robotic lung transplant (done by only a handful of centers worldwide), and the hospital's first robotic mastectomy. These milestones highlight how robotics is making a wider range of

complex surgeries possible in the UAE.

At Cleveland Clinic Abu Dhabi, robotic surgery covers multiple specialties, from gastrointestinal and bariatric to urologic, gynecologic, hepatopancreatobiliary, transplant, oncologic, and endocrine surgeries. Robotic-assisted surgeries are more precise, less invasive, reduce recovery times, with shorter hospital stays, and provide local access to procedures that once required travel abroad.

The invisible hand of AI

Artificial intelligence is a quieter force of innovation in healthcare. Algorithms now underpin key aspects of care across the hospital, often unseen by patients but transforming outcomes.

An AI-powered colorectal cancer screening program reached more than 2,000 people within weeks of its launch, catching risks earlier and expanding access to preventive care. At the Fatima bint Mubarak Cancer Center, adaptive radiotherapy recalibrates beams in real time, precisely targeting tumors while sparing healthy tissue. In stroke care, AI-driven imaging has reduced critical diagnostic delays from hours to minutes, enabling faster, life-saving interventions.

Innovation meets expertise

Cleveland Clinic Abu Dhabi's track record of firsts shows that it is no longer just adopting medical innovation; it is shaping it. Guided by a deeply ingrained patients-first philosophy, the hospital stresses that technology is a facilitator, not a substitute for care. Equally important are the caregivers behind the machines; the physicians, nurses, and clinical specialists who bring expertise, decision-making, and compassion to every procedure.

The hospital is investing heavily in



people, including Emirati caregivers, to ensure these tools are embedded into the country's healthcare system for the long term. Through education and research, it is setting new standards in professional development, enabling complex, advanced procedures to be performed locally with world-class precision.

As the first institution in the UAE to receive Provisional Accreditation by the Accreditation Council for Continuing Medical Education (ACCME®), Cleveland Clinic Abu Dhabi reinforces its role in training the next generation of healthcare professionals. By integrating technology with expert human talent, the hospital ensures that as medical innovations evolve, its people remain at the forefront of modern medicine, as innovations continue to evolve.

Looking ahead

As healthcare innovation grows more sophisticated and refined, Cleveland Clinic Abu Dhabi's trajectory signals a future that is more precise, personalized, and compassionate than ever before. This shift positions Abu Dhabi and the UAE as a hub of innovation, setting new benchmarks in modern medicine and shaping the global conversation on the future of care. MEM

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Trust: The keystone of healthcare transformation in the AI era

The healthcare sector is undergoing major transformations driven by ambitious national strategies that place health investment at the heart of sustainable development. These changes are a response to a new wave of investment in modern technologies, all to meet the needs of patients and the demands of an advanced healthcare sector. The real challenge today is to build a system of trust that ensures the integrity of medical professionals and the transparency of their data. Trust is no longer just a moral value; it has become an essential condition for the success of any modern healthcare system.

■ By Sunil Kumar
CEO, DataFlow Group

The mobility and trust assurance of healthcare professionals

One of the biggest challenges facing modern healthcare today is not lack of resources or technology, but rather the mobility and trust assurance of its workforce. The qualifications of healthcare practitioners are key to medical success, but with a highly mobile workforce, ensuring these credentials are valid and trusted has become a strategic necessity. Experience shows that any digital transformation initiative is at risk if it isn't built on a foundation of strict verification of practitioner qualifications, especially as they move between institutions or countries. This reality is underscored by global indicators, as the World Health Organization anticipates a shortfall of up to 11 million health workers by 2030, while half of all health professionals worldwide face mobility and migration obstacles. The numbers reflect a complex reality: 19% of physicians globally were trained outside their home countries; 41% of doctors in the UK are not UK-trained; and nearly 25% of physicians in the US are graduates of foreign medical schools. The number of migrating doctors and nurses within OECD countries has increased by 60% over the last decade. Regionally, data from Saudi Arabia reveals that 60% of physicians and 57% of nurses are expatriates, requiring the Kingdom to employ approximately 175,000 additional health workers by 2030. These statistics confirm that reliable qualification verification is no longer an administrative choice; it has become a strategic pillar for ensuring the quality and sustainability of healthcare systems.

DataFlow's role in building trust

In our region, there's a growing awareness

that building sustainable healthcare systems requires solutions that go beyond infrastructure. For instance, Saudi Vision 2030 puts human health at the core of its national transformation plans, emphasizing that competence is inseparable from integrity and transparency. In this context, verifying qualifications serves as a strategic tool not only to manage risks but also to enable innovation and investment in the healthcare sector.

This is where **DataFlow** solutions come in. We are developing advanced verification solutions powered by **artificial intelligence (AI)** to support Primary Source Verification (PSV). These solutions enable health authorities and hospitals to reduce risks, detect manipulation attempts early, and process vast amounts of documents quickly and accurately. We see AI not as a replacement for human expertise, but as a tool that enhances it and gives it a proactive edge, ensuring that human judgment remains the final safeguard in the process.

It has become clear that innovation in healthcare isn't limited to devices and software; it also includes governance and workforce management. AI can improve diagnosis and speed up treatment, but its true value emerges when paired with the integrity of the professionals who use it. Here, verification plays a vital, though often unseen, role in every successful treatment journey.

Trust: The currency of the future

Saudi Vision 2030 offers a comprehensive model for rebuilding the healthcare sector to be more efficient and sustainable. This vision focuses on investing in people, enhancing quality of life, and adopting the latest technologies. These goals can only be achieved with a strong verification system that ensures medical professionals are qualified and trustworthy. Our partnership with the

Saudi Commission for Health Specialties and other regulatory bodies aims to strengthen verification systems and develop tools that can meet future needs.

Through our relationships with hospitals and healthcare institutions, we've seen that reliable verification is no longer just a back-office task; it has become a strategic factor at the heart of system sustainability. When hospitals are confident in the integrity of the staff they hire, they are better able to invest in innovation and expand their services. Similarly, building safe and healthy work environments requires professionals to feel they are part of a fair and transparent system, which our reliable and rigorous systems provide.

Today, **DataFlow** solutions are an integral part of healthcare evolution. They don't just support administrative procedures; they improve the efficiency of staff, enhance patient safety, and empower healthcare institutions to make faster, more accurate decisions. As the mobility of medical professionals across borders increases, our role becomes even more critical in ensuring that every qualification or license is based on a sound and verifiable foundation.

Our vision for the future of healthcare is one that will rely heavily on technology. However, this future will not be secure unless it's built on a solid foundation of **institutional trust**. Our mission at DataFlow is to be the guarantor of this trust and to support major healthcare transformations with intelligent, transparent verification tools that serve both the sustainability of the sector and, most importantly, the individual. Trust is not just an abstract value; it is the currency of the future by which the success of any healthcare system will be measured. 

Shaping the Future of Global Healthcare, **Together.**

Our tech-driven solutions provide a comprehensive, multi-layered assessment of a medical professional's credentials, needed to ensure qualified talent can move seamlessly across borders. This builds a foundation of trust that protects public health and enhances healthcare quality for everyone.

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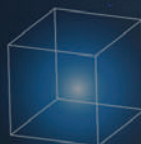


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Fostering transparent, modernized, regulatory ecosystems



DATAFLOW



From vision to reality: Preparing the healthcare sector for agentic AI

Dr Harry Lykostratis, Founder, Lead Engineer and Chief Executive Officer of Open Medical, explains how a new approach using an 'AI Orchestrator' can address the challenge of unifying AI ecosystems within healthcare, creating a framework to unlock the power of AI today and prepare for the next generation of 'agentic AI' that can transform clinical and operational workflows.

Across the GCC, ambitious national health strategies rightfully identify the immense potential of AI software to support clinical decision-making, enhance productivity, and improve the patient journey. This optimism is well-founded, as AI tools are advancing at an incredible pace. However, the global health sector is facing an 'applicability crisis', struggling to deploy these tools at scale.

While technologies like ambient voice for clinical documentation show promise, they are largely an evolution of existing processes, not the revolution needed to unlock widespread transformation.

The challenge of scalability and applicability

What is holding healthcare back from leveraging more advanced AI? Clinical and digital health leaders face common hurdles: data governance concerns often limit AI models to small datasets, while complex integration with diverse Electronic Medical Records (EMRs) presents a significant technical and financial barrier. This makes it challenging to embed solutions reliably into organizational workflows.

We must resolve these foundational issues to prepare for the near future: the shift from individual AIs to **agentic AI ecosystems**.

Today, we use AI for single tasks. In the future, an AI 'agent' will orchestrate multiple tools and data sources to achieve a complex goal with minimal human input. In many industries, these agents may operate as 'black boxes', but this is not an option in healthcare. Every step must be transparent, auditable, and explainable to ensure clinical governance and patient safety.

The solution: An AI Orchestrator

Open Medical is addressing these challenges through our **Ensiab Orchestrator**. Our

Ensiab platform is already built for workflow optimization and interoperability with proven experience integrating with major EMRs and clinical systems globally. Our additional AI Orchestrator capabilities will handle the data cleansing and pseudonymisation required to make clinical data securely available for AI models, simplify their integration into systems and orchestrate their use within workflows for maximum efficiency.

Our vision is a single, unified integration point. Any AI tool connected to Ensiab can be securely and rapidly integrated with hospital systems, allowing healthcare organisations to experiment with new models and quickly scale those that prove effective. To prepare for the agentic era, our orchestrator is built on four key principles:

1. **Parallel Processing:** Simultaneously analyse diverse data types like EMR data, PDFs, and images using multiple specialized AI tools.
2. **Sequential Processing:** Chain AI models, where the output of one becomes the input for the next, creating sophisticated automation.
3. **Routing:** Direct outputs in the correct sequence to execute specific tasks within a defined clinical workflow.
4. **Feedback:** Create a learning loop from outcomes, enabling continuous model improvement over time.

A practical application: Optimizing referral management

Consider referral management, a common bottleneck. An AI agent can triage patients far more effectively than traditional linear processes. Using our four-step framework, the Orchestrator could simultaneously process a referral letter, the patient's medical history, and a medical image using different specialized

Our vision is a single, unified integration point. Any AI tool connected to Ensiab can be securely and rapidly integrated with hospital systems, allowing healthcare organisations to experiment with new models and quickly scale those that prove effective.

AI models. The combined outputs are then fed into a final model to determine the most appropriate care pathway—be it a specialist, a physiotherapist, or a return to primary care. The decision is automated, and a summary is written back to the patient's record, improving efficiency and patient flow.

Building a future-ready healthcare system

Open Medical does not develop AI models. We are model-agnostic, as we believe organizations should have the freedom to choose the best tools for their needs. Our focus is on creating the agile platform that allows these models to work together seamlessly.

Our ambition is to provide an orchestration layer that integrates with existing systems, taps into data securely, and routes it to various AI models, presenting the outputs meaningfully within the clinical workflow. This will empower healthcare providers to move from isolated pockets of AI to a system where AI is a core driver of efficient, timely, and high-quality care. By addressing the applicability crisis now, we can harness these revolutionary technologies to help deliver a world-class standard of healthcare across the region. 

- For more information, visit: www.openmedical.co.uk

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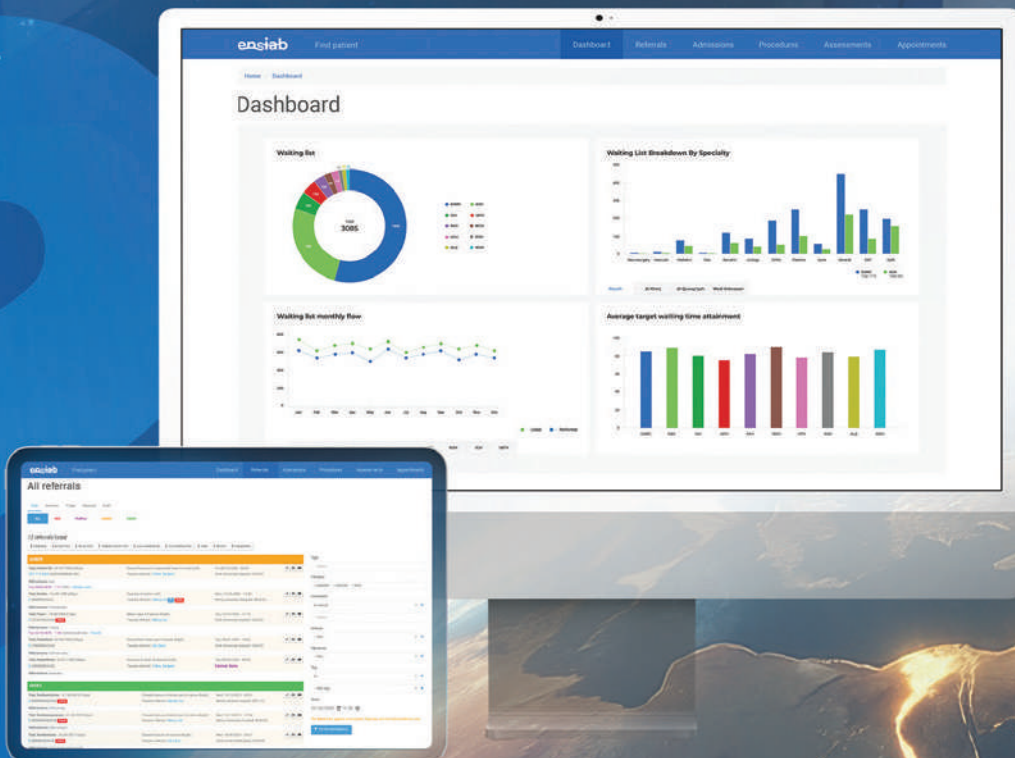
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Government unveils major NHS transformation targeting AI-enabled healthcare by 2035

UK Health Secretary Wes Streeting's recently published 10-year health plan promises fundamental restructuring of Britain's health service with a £29 billion investment, neighbourhood-based care models and ambitious digitisation goals, though experts question implementation feasibility amid resource constraints and organisational upheaval.

The government has published its most ambitious healthcare reform blueprint in decades, setting out a comprehensive 10-year transformation plan designed to rescue the NHS from what Health Secretary Wes Streeting describes as "the worst crisis in its history". The plan, published on 3 July 2025, proposes three fundamental shifts that could reshape British healthcare: moving care from hospitals to communities, transitioning from analogue to digital systems, and pivoting from treating sickness to preventing illness.

Major structural overhaul promised with £29 billion backing

The document reveals plans for sweeping organisational changes, including the abolition of NHS England and its integration with the Department of Health and Social Care, reducing central headcount by 50%. This represents a dramatic reversal of the 2012 Health and Social Care Act reforms, with power being redistributed from Whitehall to local providers and patients.

Central to the transformation is the

creation of Neighbourhood Health Services designed to deliver care "as locally as it can, digitally by default, in a patient's home if possible, in a neighbourhood health centre when needed, in a hospital if necessary". The plan commits to establishing a Neighbourhood Health Centre in every community, beginning with areas of lowest healthy life expectancy, operating at least 12 hours daily, six days weekly.

The government has allocated £29 billion in additional investment to

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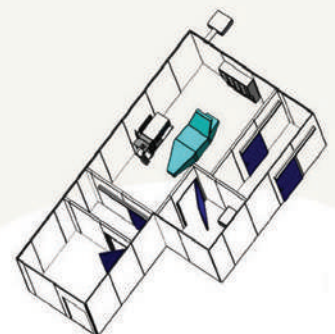
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– UK Health Secretary Wes Streeting

fund these reforms, alongside service improvements and new technology. However, Dr Jennifer Dixon DBE, Chief Executive of the Health Foundation, has highlighted resource challenges, noting that health spending will grow by just 2.8% annually between 2025/26 and 2028/29, “lower than the historic average (3.7%) and much lower than Labour’s last period in government (6.8%)”.

Digital revolution targets AI integration across clinical pathways

Perhaps the most technologically ambitious aspect involves creating what officials describe as “the most AI-enabled health system in the world”. The plan outlines five transformative technologies: high-quality health data systems, AI-driven patient empowerment and productivity tools, genomics for personalised care, wearables for real-time monitoring, and robotics for precision medicine.

The NHS App will be transformed into a comprehensive healthcare portal by 2028, functioning as a “full front door to the entire NHS”. Patients will access instant advice through “My NHS GP” AI algorithms, choose providers via “My Choices”, and manage chronic conditions through integrated digital tools. The plan promises that AI will become “every nurse’s and doctor’s trusted assistant”, with ambient voice technology reducing administrative burdens and freeing clinical time for patient care.

Genomics represents another cornerstone of the digital transformation. The document outlines plans for universal newborn genomic testing and population-based polygenic risk scoring by decade’s end. This genomics population health service aims to identify disease risks years before symptoms appear, enabling truly

preventive healthcare. As the plan states: “In the next decade science will reveal the nature of a baby’s personal genome, giving parents and clinicians the ability to unlock the secrets of a child’s future health.”

Prevention strategy tackles obesity and smoking with ‘moonshot’ ambitions

The prevention agenda includes what the government terms a “moonshot to end the obesity epidemic”. This involves restricting junk food advertising to children, banning high-caffeine energy drink sales to under-16s, and introducing mandatory healthy food sales reporting for large companies. The world-leading Tobacco and Vapes Bill will create the first smoke-free generation, with children turning 16 in 2025 never legally able to purchase tobacco.

Innovation in weight management includes expanding access to GLP-1 receptor agonists through novel NHS partnerships with industry, including “pay for impact on health outcomes” models. The plan estimates that by 2100, the anti-smoking legislation alone will provide cumulative NHS savings of £6.6 billion and £64.2 billion in economic productivity gains.

Productivity targets address financial sustainability concerns

Recognising current productivity challenges, the government has set the NHS a target of 2% year-on-year productivity gains for the next three years. This follows a 20-25% productivity drop during the COVID-19 pandemic from which the service has not fully recovered. The plan emphasises that “more money alone has not always led to better care” and promises to end “the era of the NHS’s answer always being ‘more money, never reform’”.



Wes Streeting, UK Health Secretary

Financial reforms include ending deficit support funding worth £2.2 billion annually from 2026/27, with organisations expected to achieve surplus by 2029/30. New payment mechanisms will include “Year of Care Payments” that allocate capitated budgets for patients’ annual care rather than fee-for-service models, encouraging preventive interventions.

Quality and transparency measures target systematic failures

Responding to historical scandals including Mid Staffordshire and ongoing maternity care failures, the plan promises to make the NHS “the most transparent healthcare system in the world”. Quarterly league tables will rank providers against key quality indicators, with patient-reported outcome measures becoming universal by 2029.

A National Maternity and Neonatal Taskforce, chaired by the Health Secretary, will develop action plans co-

produced with bereaved families. The Care Quality Commission will transition to an intelligence-led regulatory model supported by AI warning systems and rapid response inspection capabilities.

Expert concerns over implementation and resource adequacy

Despite welcoming the plan's ambitions, healthcare experts have raised significant concerns about deliverability. Dr Dixon noted that "proposals to develop more integrated neighbourhood health services look similar to a long line of NHS policy initiatives, and it's unclear whether past lessons have been learned to enable the latest versions to succeed".

The Health Foundation highlighted that capital investment in buildings, equipment and IT will grow by just 1% annually, potentially constraining the

technological transformation promised. Dr Dixon emphasised that "without investment and reform of the threadbare social care system, or co-ordinated action to address the wider social and economic causes of ill health, the plan remains largely a vision for the NHS, rather than a plan for rebuilding the nation's health".

Workforce transformation balances technology with human elements

The plan acknowledges that healthcare will "look very different in 10 years' time" and promises that while there will be fewer staff than projected in the 2023 Long Term Workforce Plan, "those staff will be better treated, more motivated, have better training and more scope to develop their careers". Every NHS staff member will receive personalised career coaching and development plans by 2035.

International recruitment will be reduced from current levels where 34% of new recruits have non-UK nationality to less than 10% by 2035, with greater emphasis on recruiting from local communities. The plan includes creating 2,000 additional nursing apprenticeships over three years and expanding medical school places focused on widening participation.

As Health Secretary Streeter concludes in his afterword: "We will take the best of the NHS to the rest of the NHS and we will apply the best examples of innovation from around the world to the benefit of millions of people here at home." However, the success of this unprecedented transformation will depend on overcoming significant implementation challenges and resource constraints identified by leading health policy experts. M&H

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Cedars-Sinai ranked among top U.S. hospitals

Cedars-Sinai has been named to the Honor Roll for the 10th consecutive year and tied for No. 1 in California and Los Angeles in *U.S. News & World Report's* "Best Hospitals 2025-26" rankings.

But the Cedars-Sinai story goes far beyond the numbers. It's a story of impact across continents, of patients finding answers, and of a health system that meets people where they are – from Los Angeles to Mexico, Singapore to London, and beyond.

Every year, thousands of patients from over 100 countries choose Cedars-Sinai for care they can't find somewhere else. From complex surgeries to rare diagnoses and second opinions, the Cedars-Sinai International team ensures a seamless journey for international patients – before, during, and after care.

Home away from home

Located in Beverly Hills, Cedars-Sinai offers international patients access not only to trusted medical care but also to world-class comfort, cultural understanding, and convenience. Multilingual care teams and interpreters ensure clear communication at every stage, while dedicated support is available as they navigate their journey to Los Angeles. Spiritual and dietary needs are thoughtfully accommodated, and private concierge services offer personalized assistance throughout the stay. Patients and families can also relax and recharge in the Cedars-Sinai International Lounge – a dedicated space designed for comfort, privacy, and peace of mind.

Among the many lives touched by this level of care is Suhail, a young patient from the Gulf region who arrived at Cedars-Sinai facing life-threatening conditions. After receiving both a heart and kidney transplant, Suhail recovered with remarkable strength. "I didn't expect to have Suhail back and even better than he was," said his mother, Fatima Hussain. "Thanks to the hospital and doctors for giving Suhail a second chance at life."

Clinical excellence across the board

The Smidt Heart Institute leads the world in adult heart transplants, and the Samuel Oschin Cancer Center offers over 60 cancer-specific programs and access to clinical trials not widely available elsewhere. In addition, Cedars-Sinai had 11 specialties in the *U.S. News & World Report* hospital rankings. The specialty rankings mean Cedars-Sinai is among the top 50 hospitals in the U.S. in these specific clinical areas.

Cedars-Sinai specialties ranked in the top five in the U.S.:

- Gastroenterology & GI Surgery
- Orthopedics
- Pulmonology & Lung Surgery

Cedars-Sinai specialties ranked in the top 10 in the U.S.

- Cardiology, Heart & Vascular Surgery
- Diabetes & Endocrinology
- Obstetrics & Gynecology

Cedars-Sinai specialties ranked No. 1 in California (highest *U.S. News* ranking in the region):

- Cardiology, Heart & Vascular Surgery

- Gastroenterology & GI Surgery
- Orthopedics

"At Cedars-Sinai, we are fortunate to have passionate, talented healthcare professionals who work tirelessly to meet the needs of our patients and our communities, locally and globally," said Peter L. Slavin, MD, president and CEO of Cedars-Sinai Health System and the David and Meredith Kaplan Presidential Chair. "Their dedication is the reason our clinical programs are ranked among the top in the U.S."

Care that connects

From Arab Health in Dubai to medical education sessions in Doha, Abu Dhabi, Cape Town, Mexico, Georgia, and beyond, Cedars-Sinai continues to expand its global footprint – sharing world-class expertise through clinics, offices, and strategic collaborations around the world. Our presence now includes offices in Mexico, Ecuador, Singapore, and China. We also recently opened our initial clinic in London, with another clinic location in London due to open in 2026. This growing international network brings our trusted care model closer to patients and partners worldwide – wherever they are.

"Our network continues to grow, but our focus never changes – the patient is always at the center," says Dr. Hassoun. "Wherever you are in the world, Cedars-Sinai is here for you." MEH



10 Years

in a Row on the 'Best Hospitals'
Honor Roll in the U.S.

Cedars-Sinai has been named to the Honor Roll for the 10th consecutive year and tied for No. 1 in California and Los Angeles in U.S. News & World Report's "Best Hospitals 2025-26" rankings.

Every year, thousands of patients from over 100 countries choose Cedars-Sinai for our renowned healthcare. From complex surgeries to rare diagnoses and second opinions, the Cedars-Sinai team ensures a seamless experience - before, during, and after care.

Six Cedars-Sinai specialties were ranked in the top 10 in the U.S.:

- | | | |
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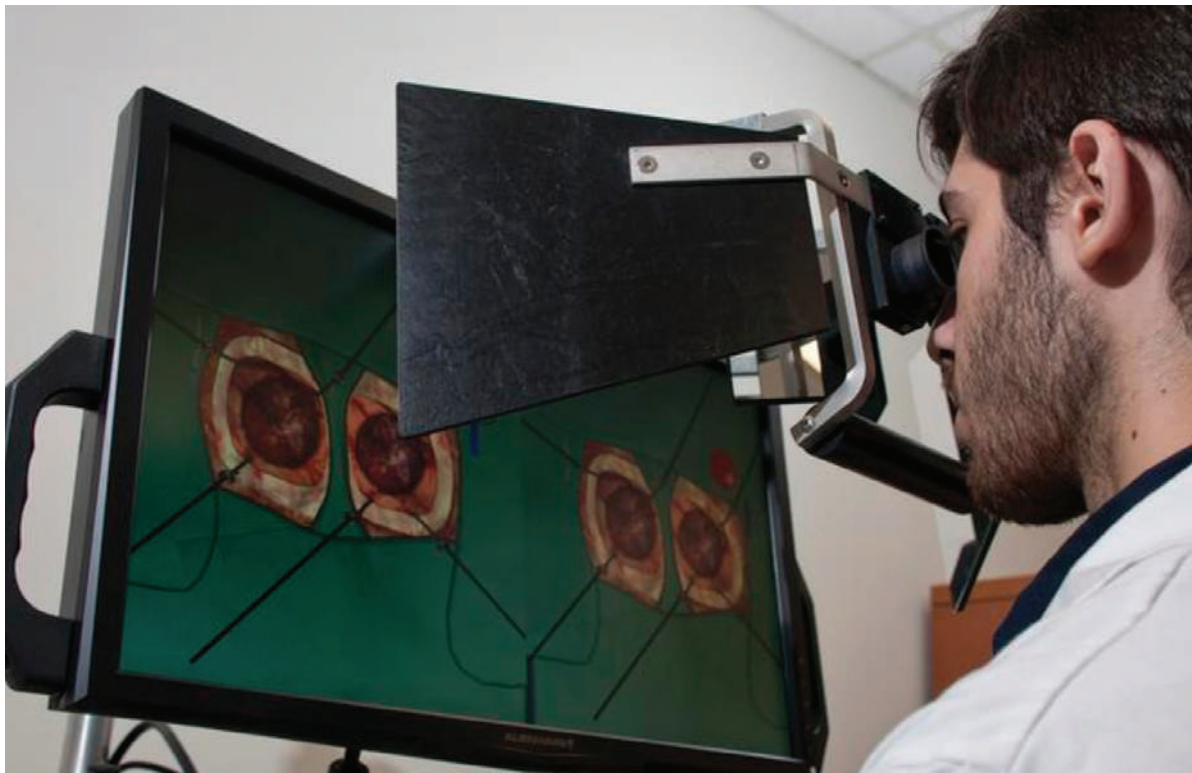
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AI-enhanced human instruction outperforms standalone artificial intelligence in neurosurgical training

Researchers at McGill University have demonstrated that combining artificial intelligence with expert human instruction delivers superior results compared to AI-only or traditional teaching methods in neurosurgical simulation training, with significant implications for advanced high-stakes technical education across multiple disciplines.

A groundbreaking study from The Neuro (Montreal Neurological Institute-Hospital) at McGill University has revealed that the most effective approach to training neurosurgeons combines artificial intelligence analytics with human expertise, challenging assumptions about AI replacing traditional instruction methods.

The research, published in *JAMA Surgery* on 6 August 2025, examined 87 medical students from four Quebec medical schools using virtual reality neurosurgical simulators. The findings suggest that whilst AI tutoring systems can provide valuable data-driven insights, they achieve optimal results when integrated with experienced human instruction rather than operating independently.

Comparative training methodology reveals hybrid approach superiority

The study employed a three-group

experimental design to evaluate different training approaches. Students were divided into groups receiving AI-only verbal feedback, traditional expert instructor feedback, and a hybrid model where expert instructors utilised real-time AI performance data to inform their teaching.

The hybrid group demonstrated measurably superior performance across multiple metrics, including surgical skill acquisition speed, technique refinement, and critically, skill transfer capabilities. These students also showed significantly enhanced risk management abilities, particularly regarding bleeding control and tissue preservation – fundamental competencies in neurosurgical practice.

Technical integration enhances educational outcomes

The research builds upon previous work at

the Neurosurgical Simulation and Artificial Intelligence Learning Centre, where AI tutoring systems had initially outperformed traditional human instruction. However, this earlier comparison involved human instructors working without access to AI-generated performance analytics.

“Our findings underscore the importance of human input in AI-driven surgical education,” explained lead author Bianca Giglio. “When expert instructors used AI performance data to deliver tailored, real-time feedback, trainees learned faster and transferred their skills more effectively.”

The virtual reality simulation environment enables comprehensive monitoring of student performance whilst providing immediate analytical feedback on surgical technique, decision-making, and procedural accuracy. This

continuous assessment capability allows for unprecedented precision in identifying areas requiring improvement.

Implications extend beyond neurosurgical education

The study's methodology and findings carry significant implications for technical training programmes across various high-stakes professions. The research demonstrates that AI systems excel at providing consistent, data-driven performance analysis, whilst human instructors contribute essential contextualisation, adaptability, and engagement that pure AI systems cannot replicate.

Dr Rolando Del Maestro, senior author and Director of the Centre, emphasised the collaborative nature of this educational approach: "AI is not replacing educators

– it's empowering them. By merging AI's analytical power with the critical guidance of experienced instructors, we are moving closer to creating the 'Intelligent Operating Room' of the future capable of assessing and training learners whilst minimising errors during human surgical procedures."

Future directions in AI-augmented medical training

The research suggests that optimal educational outcomes emerge from strategic integration of AI capabilities with human expertise rather than wholesale replacement of traditional teaching methods. This finding challenges prevalent assumptions about AI's role in professional education and suggests a more nuanced approach to implementing artificial

intelligence in training environments.

The study's focus on skill transfer – the ability to apply learned techniques in new contexts – represents a crucial development in understanding how complex technical skills develop. This metric proves particularly relevant for neurosurgical training, where practitioners must adapt established techniques to unique patient presentations and varying clinical scenarios.

The research programme was supported by multiple funding bodies, including the Brain Tumour Foundation of Canada, the Royal College of Physicians and Surgeons of Canada, and several Quebec-based research foundations, reflecting the collaborative nature of advancing neurosurgical education through technological innovation. 

Reference:

Giglio, B., Del Maestro, R., et al. (2025). Artificial intelligence augmented human instruction and surgical simulation performance. *JAMA Surgery*. Published online August 6, 2025. <https://doi.org/10.1001/jamasurg.2025.2564>

Brain wave patterns reveal neural fingerprints of obsessive-compulsive disorder

Researchers have identified specific neural signatures in deep brain structures that could transform treatment approaches for patients with severe obsessive-compulsive disorder. The study, involving 11 patients with treatment-resistant OCD, discovered unique brain wave patterns that serve as biomarkers for compulsive behaviours.

Dutch scientists have pinpointed the precise neural signatures of obsessive-compulsive disorder within deep brain structures, offering new pathways for targeted therapeutic interventions. Using advanced sensing electrodes implanted in patients' brains, the research team identified specific brain wave patterns that correlate directly with compulsive behaviours, potentially enabling more precise and effective treatments.

The study, conducted at Amsterdam University Medical Centre and published in *Nature Mental Health*, represents the largest investigation

of its kind, examining intracranial brain activity in 11 patients with treatment-resistant OCD who had undergone deep brain stimulation therapy.

Mapping the neural architecture of compulsion

The research team employed a sophisticated experimental approach, recording brain activity from electrodes already implanted for deep brain stimulation treatment. Patients were guided through carefully controlled scenarios designed to trigger their specific obsessions and compulsions whilst neural activity was monitored with unprecedented precision.

"We identify two general markers of compulsion: delta and alpha LFP power was significantly increased during all compulsions in the external globus pallidus, nucleus accumbens, anterior limb of the internal capsule and anterior lateral anterior commissure," the authors reported in their findings.

The study focused on the cortico-striato-thalamo-cortical circuit, a brain network known to be disrupted in OCD. By recording from multiple structures within this circuit, including the external globus pallidus, nucleus accumbens, and internal capsule, researchers could observe how different

brain regions contribute to obsessive and compulsive symptoms.

Distinguishing thought from action

A crucial innovation in this research was the team's ability to separate neural signatures of mental compulsions from those involving physical movement. This distinction proved essential for identifying universal biomarkers of compulsivity that weren't confounded by motor activity.

"In mental compulsion subtypes, similar low-frequency increases were observed only in GPe (delta/alpha) and ALIC (alpha), suggesting that these signals possibly reflect more universal biomarkers of compulsivity unconfounded by motor function," the researchers noted.

This separation allowed the team to identify brain wave patterns that reflect the core experience of compulsion itself, rather than simply the physical movements that often accompany compulsive behaviours. The finding suggests that certain brain regions may serve as more reliable targets for therapeutic intervention.

Delta waves as disease indicators

The research revealed that delta brain waves, typically associated with deep sleep, showed particularly strong correlations with OCD symptoms. In the external globus pallidus, delta wave activity correlated directly with patients' reported severity of obsessive thoughts.

"GPe delta power correlated with OCD symptom severity, establishing a meaningful connection between subcortical sensing DBS readout and patient experience," the authors explained.

This correlation represents a significant advance in objective measurement of OCD symptoms, potentially offering clinicians a neural readout of symptom severity that doesn't rely solely on patient self-reporting.

Cross-frequency coupling reveals network dysfunction

Beyond individual brain wave patterns, the researchers discovered abnormal interactions between different frequency bands during compulsive episodes. In the anterior limb of the internal capsule, they observed increased coupling between theta and alpha waves specifically during compulsions.

"ALIC alpha power was modulated by the phase of theta oscillations during compulsions, possibly reflecting pathological coupling of cortical networks in OCD," the team reported.

This finding suggests that OCD involves not just increased activity in specific brain regions, but also disrupted communication patterns between different neural networks.

Implications for therapeutic development

The identification of these neural biomarkers opens new possibilities for adaptive deep brain stimulation systems. Current DBS treatments operate continuously, regardless of whether patients are experiencing symptoms. The newly discovered biomarkers could enable "closed-loop" systems that activate only when specific neural signatures are detected.

Currently, deep brain stimulation still works as a sort of 'always on'-system. The electrodes are constantly sending electrical signals, without distinguishing between moments in which that may, or may not, be necessary. The newly discovered biomarkers pave new ways towards a more targeted approach. This targeted approach could potentially improve treatment efficacy whilst reducing side effects and energy consumption of implanted devices.

Methodological advances in psychiatric neuroscience

The study employed several technical innovations that enhanced the reliability of findings. Researchers used the Lead-DBS toolbox to precisely localise electrode positions in each patient's brain, ensuring accurate anatomical targeting. They also implemented

rigorous controls for movement-related brain activity, a common confound in neurological research.

The experimental design involved four distinct phases: baseline recording whilst patients watched a neutral film, obsession induction through personalised triggers, compulsion performance, and post-compulsion relief. This structured approach allowed researchers to isolate neural activity specific to each symptom component.

Clinical significance and future directions

The research demonstrates that reliable neural signatures of OCD can be identified across multiple patients, moving beyond previous case studies that focused on individual participants. This group-level consistency is essential for developing standardised therapeutic protocols.

"Our results demonstrate unique, group-level LFP correlates of core OCD symptoms across disease-relevant basal-ganglia structures. These electrophysiological signatures help pave the way toward the development of biomarker-targeted neuromodulatory intervention for OCD," the authors concluded.

However, the researchers acknowledge limitations in their study, including the relatively small patient cohort and the complexity of categorising OCD symptoms into discrete states. Future research will need to validate these biomarkers in larger patient populations and explore their utility in guiding therapeutic interventions.

The findings represent a significant step towards precision medicine approaches for psychiatric disorders, potentially transforming how clinicians monitor and treat severe OCD. As sensing technology continues to advance, these neural biomarkers may become integral components of next-generation therapeutic systems. MEH

Reference:

Arbab, T., Bais, M. N., Figeo, M., et. al (2025). Intracranial electrophysiological biomarkers of compulsivity in obsessive-compulsive disorder. *Nature Mental Health*, 3, 889–898. <https://doi.org/10.1038/s44220-025-004>



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A unique patient journey – from prevention to recovery at home

The cereneo clinics are among the world's leading providers of neurorehabilitation. By incorporating the latest research findings and sensor-based assessments and activity profiles, therapies can be precisely tailored and optimised. As a pioneer in the field of precision rehabilitation and a key driver of innovation in neurorehabilitation, cereneo is working on forward-looking solutions to relieve the burden on the overstrained healthcare systems and cater to the needs of an ageing population. With the addition of a neuro prevention centre, cereneo is leveraging its expertise in neurology to specifically reduce risks for neurological diseases and optimise lifestyles for long-term health. The holistic prevention approach for long-term health combines personalised nutrition, sleep, recovery and exercise.

A personalised journey of brain health

Neurorehabilitation at cereneo is not just about treating illnesses but about shaping a tailor-made journey of brain health. This begins with prevention. Using state-of-the-art diagnostics, sensor technology and lifestyle assessments, cereneo Prevention identifies individual risk factors early on and creates actionable programmes for long-term health and wellbeing. Patients benefit from tailored guidance on nutrition, sleep, resilience and physical activity – ensuring that brain health is supported long before a disease emerges.

When neurological illness does occur, cereneo offers highly personalised inpatient rehabilitation. The interdisciplinary team of neurologists, therapists, nurses and researchers work hand in hand to optimise every therapy plan. Progress is continuously measured with advanced assessment tools, enabling patients to achieve their maximum recovery potential through highly personalised therapies.

Therapy without borders

The patient journey at cereneo continues beyond the clinic. For many, the most critical phase of rehabilitation begins

once they return home – where recovery must be integrated into everyday routines especially when access to local therapists is limited. This is where cereneo's therapy at home concept comes into play.

A personal therapist travels to the patient's home, adapting training to the living environment and ensuring family involvement. This approach not only accelerates reintegration into daily life but also fosters confidence and independence in familiar surroundings and ensures continuous progress. Rehabilitation becomes more natural, sustainable and motivating.

Alongside therapy at home, cereneo offers continuous online therapy. Through digital platforms and sensor-based assessments, therapists can monitor progress, adjust exercises and provide ongoing encouragement remotely. This ensures patients remain connected, supported and guided – no matter where they are in the world.

Redefining neurorehabilitation

By seamlessly connecting prevention, inpatient rehabilitation, therapy at home and digital follow-ups, cereneo sets new standards in personalised medicine. Patients experience care that goes far beyond the traditional boundaries of rehabilitation – transforming treatment into a lifelong journey of health and empowerment.

At the same time, this model addresses a global challenge: overstrained healthcare systems and the growing burden of neurological disease in ageing societies. Prevention, early intervention and continuous support at home all help reduce hospital stays, lower long-term costs and improve quality of life for patients.

A pioneer in brain health

cereneo's mission is clear: to combine scientific innovation with personalised care, offering patients the best possible outcomes while shaping the future of neurorehabilitation. With cereneo



Prevention, cereneo is pioneering a proactive approach to brain health long before an illness develops.

To find out how cereneo can support your journey to brain health, scan the QR code to book an online consultation with one of our neurologists:



If you want to stay informed about the cereneo Prevention programme, scan the QR code and register for updates:





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& REHABILITATION



Pioneering in
Brain Health:
A patient journey
of personalised
medicine



Clinique Valmont: Excellence and innovation in neurological rehabilitation



Life can change in an instant. A stroke, Parkinson's disease, multiple sclerosis... Such events affect not only the patient but also their loved ones. At these crucial times, being able to rely on an exceptional healthcare facility offering comprehensive and personalised support truly makes all the difference.

A comprehensive integrated approach and multidisciplinary team

Clinique Valmont's multidisciplinary team combines physiotherapy, occupational therapy, speech therapy, and neuropsychology to address not just physical rehabilitation but also communication and cognitive functions.

The facility's therapists work closely to adapt programmes as the patient progresses, ensuring continuous improvement and personalised support. Regular assessments allow the team to refine therapies, adapting intensity and focus according to each patient's evolving needs.

At the heart of Clinique Valmont's excellence is its exceptional multidisciplinary team, led by world-renowned neurologist Professor Julien Bogousslavsky. Bringing together all specialists in neurology, physiotherapy, speech therapy, and neuropsychology, the team works in close collaboration to design and deliver highly personalised, innovative treatment programmes for each patient.

Personalised therapies and state-of-the-art equipment

Each patient benefits from a tailored therapy programme, precisely adjusted to their needs and abilities. Clinique Valmont continually invests in cutting-

edge technology to deliver therapies that maximise recovery potential.

Among the standout innovations is a treadmill developed with NASA technology that reduces body weight during gait training, allowing patients to practise walking movements with reduced strain and increased safety. This is complemented by access to a therapeutic pool, where patients can move in a low-impact environment that soothes pain and builds endurance.

This combination of advanced equipment and personalised care ensures that every therapy session is optimised for efficacy and patient comfort.

Tailored support and seamless coordination

What truly distinguishes Clinique Valmont is its unwavering commitment to providing a premium patient experience at every stage, before, during, and after the stay. Each patient is paired with a dedicated coordinator who acts as their main point of contact from the very beginning. This coordinator takes care of all the details, from arranging personalised therapy schedules and coordinating with family members to organising travel logistics and ensuring smooth discharge and follow-up care.

By taking care of every detail with discretion and attention, the coordinator

allows patients and their loved ones to focus fully on recovery. The clinic upholds the highest standards of privacy, creating a secure and reassuring environment where patients can heal with confidence and peace of mind.

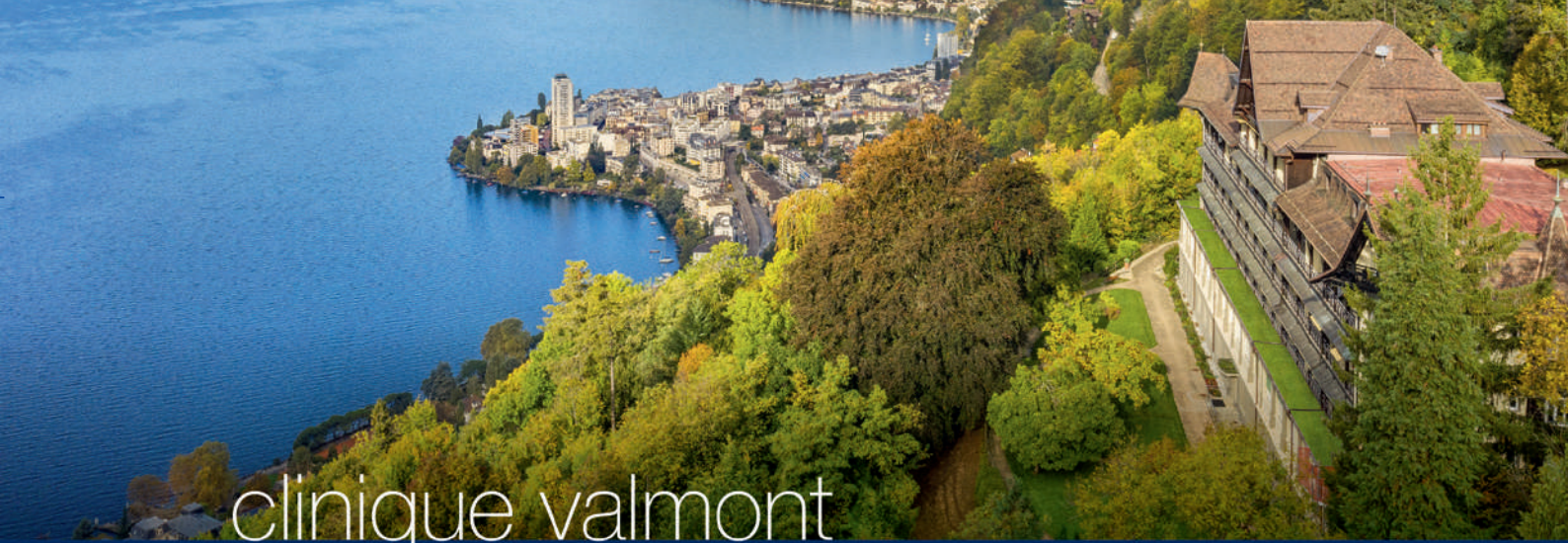
An exceptional setting, privacy and care

The clinic's commitment to excellence goes beyond clinical care to encompass the entire patient experience. Set in an exceptional, peaceful environment, Clinique Valmont offers a restorative atmosphere that supports both physical recovery and emotional wellbeing. Private, elegantly designed rooms and suites provide the highest level of comfort and discretion, while exceptional view over the lake and the Alps encourage rest and renewal. Every element, from personalised hospitality to attentive, discreet service, is thoughtfully curated to uphold privacy and promote lasting wellbeing.

A forward-looking vision

Pioneering the future of neurological rehabilitation, Clinique Valmont combines over a century of expertise with cutting-edge technology and a multidisciplinary approach. Internationally recognized and ranked among the leading institutions in Europe in this field, it offers tailored therapies and bespoke support that ensure every patient receives a seamless, premium and unique experience, providing the best foundation for recovery. 

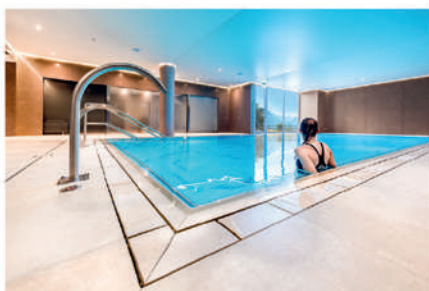




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Breakthrough chest X-ray AI surpasses tech giants with open-source model

Arizona State University researchers have developed Ark+, an open-source artificial intelligence tool for chest X-ray diagnosis that outperforms proprietary models from Google and Microsoft. The system demonstrates superior accuracy across multiple thoracic conditions while offering full accessibility to healthcare providers worldwide.

In a David versus Goliath scenario that has reshaped medical AI development, a small research team at Arizona State University has created an artificial intelligence system that significantly outperforms the proprietary chest X-ray analysis tools developed by technology giants Google and Microsoft.

The breakthrough model, called Ark+, represents a paradigm shift in medical imaging AI by proving that open-source development using publicly available datasets can surpass the performance of closed, proprietary systems trained on massive private datasets.

“Ark+ is designed to be an open, reliable and ultimately useful tool in real-world health care systems,” said Professor Jianming “Jimmy” Liang from ASU’s College of Health Solutions, lead author of the study published in *Nature* on 11 June 2025.

Superior diagnostic capabilities demonstrated

The research team evaluated Ark+ across eight clinical scenarios using ten different datasets, demonstrating exceptional performance in diagnosing both common and rare thoracic diseases. In internal evaluations using the established ChestX-ray14 dataset, Ark+ achieved a mean area under the curve (AUC) of 84.43%, significantly outperforming competing models including RAD-DINO (83.54%), MIM-CXR (83.08%), and CheSS (80.46%).

Perhaps most remarkably, Ark+ demonstrated superior zero-shot transfer capabilities, achieving impressive AUC scores for detecting pneumothorax (95.79%), paediatric pneumonia (97.60%), and tuberculosis (96.60%) in datasets it had never encountered during training.

The system’s diagnostic scope extends beyond traditional AI limitations. Through



its multi-task head architecture, Ark+ can identify conditions across different classification systems simultaneously, expanding diagnostic capabilities and addressing potential misdiagnoses by human experts.

Innovative training methodology drives performance

The key to Ark+’s superior performance lies in its novel training approach, which the researchers term “cyclically accruing and reusing knowledge.” Unlike conventional AI systems that typically use self-supervised learning methods, Ark+ was trained on heterogeneous expert labels from six public datasets comprising over 700,000 worldwide images.

“We wanted AI to learn from expert knowledge, not only from the raw data,” explained Liang. This approach preserves and utilises the most valuable information in medical datasets – the detailed diagnostic annotations provided by radiologists and other medical experts.

The system employs a teacher-student framework with multi-task heads, where

knowledge is continuously accumulated and reused across different diagnostic tasks. This cyclical pretraining process enables the model to leverage expertise from multiple institutions and diagnostic approaches.

Addressing critical healthcare challenges

Ark+ tackles several fundamental challenges in medical AI deployment. The system demonstrates remarkable few-shot learning capabilities, successfully diagnosing rare conditions like subcutaneous emphysema, tortuous aorta, and pneumoperitoneum using only 1-5 training samples per condition.

The model also exhibits robust performance in handling long-tailed disease distributions, where some conditions are significantly more common than others. In evaluations using the ChestDR dataset with 19 thoracic diseases exhibiting long-tailed distributions, Ark+ achieved a mean AUC of 86.55%, substantially outperforming other foundation models.

Crucially, Ark+ demonstrates resilience to sex-related bias, showing superior

performance across demographic groups without requiring specific bias mitigation techniques. In comprehensive bias testing, Ark+ produced 13 unbiased results compared to just 4-8 for competing models.

Adaptability to emerging health threats

The system's extensibility was demonstrated through its response to novel diseases. Despite having no prior exposure to COVID-19 during training, Ark+ achieved competitive diagnostic accuracy for COVID-19 detection. Through incremental learning, the model was successfully updated to create Ark++covid, which surpassed existing models in COVID-19 diagnosis.

"By making this model fully open, we're inviting others to join us in making medical AI more fair, accurate and accessible," Liang added. This adaptability positions Ark+ as a valuable tool for responding to future pandemic scenarios.

Open-source philosophy drives global impact

Unlike proprietary alternatives, Ark+ is fully open-source, with all code and pretrained models publicly available. This approach enables researchers worldwide to fine-tune, adapt, and improve the system for local clinical needs.

The model can be extended through federated learning to incorporate private data while preserving patient privacy,

addressing a critical concern in medical AI deployment. The researchers demonstrated that federated Ark+ maintains high performance while enabling collaborative development across multiple institutions without compromising data security.

Transforming medical imaging accessibility

Ark+'s open-source nature addresses a critical equity issue in healthcare AI. While proprietary models restrict access and limit customisation, Ark+ can be deployed in resource-limited settings and adapted for specific population needs.

The system's relatively modest computational requirements – training takes approximately 700 hours using four A100 GPUs – make it accessible to smaller institutions and developing healthcare systems. This democratisation of advanced diagnostic AI could significantly impact global health outcomes.

Clinical validation and real-world applications

The research included comprehensive clinical validation through collaboration with Mayo Clinic Arizona. Senior radiologists reviewed cases where Ark+ disagreed with official dataset labels, confirming the system's ability to identify previously missed conditions and correct potential overdiagnoses.

The model's performance extended beyond classification to support device identification, with successful detection of support devices like PICC lines and internal jugular catheters, expanding its clinical utility.

Future implications for medical AI

The success of Ark+ challenges the assumption that proprietary models with access to vast private datasets necessarily outperform open-source alternatives. The research demonstrates that strategic use of public datasets combined with innovative training methodologies can achieve superior results.

As the authors note in their discussion: "The development of Ark+ reveals that open models trained by accruing and reusing knowledge from heterogeneous expert annotations with a multitude of public (big or small) datasets can surpass the performance of proprietary models trained on large data."

This paradigm shift could accelerate medical AI development by encouraging greater data sharing and collaborative model development, ultimately benefiting global healthcare delivery.

The research represents a significant milestone in opening access to advanced medical AI, offering healthcare providers worldwide access to state-of-the-art diagnostic capabilities while maintaining the flexibility to adapt systems to local needs and emerging health challenges. MEH

Reference:

Ma, D., Pang, J., Gotway, M. B., & Liang, J. (2025). A fully open AI foundation model applied to chest radiography. *Nature*, 643, 488-498. <https://doi.org/10.1038/s41586-025-09079-8>

Artificial intelligence transforms routine X-rays into powerful osteoporosis screening tool

Scientists have developed an artificial intelligence system that can estimate bone mineral density and detect early signs of osteoporosis from standard lumbar spine X-rays. The breakthrough technology achieved 86% sensitivity for detecting bone density loss, offering new possibilities for widespread screening using commonly available radiographic equipment.

AI system delivers comparable accuracy to specialised equipment

Researchers at the University of Tokyo have created an AI-assisted diagnostic

system capable of estimating bone mineral density (BMD) in both the lumbar spine and femur using only anteroposterior lumbar X-ray images. The study, published

in the *Journal of Orthopaedic Research* on 9 July 2025, analysed 1,454 X-ray images from participants in a population-based cohort study.

The system demonstrated impressive performance metrics, with sensitivity rates of 86.4% for lumbar spine osteopenia detection and 84.1% for femoral osteopenia. Specificity rates reached 80.4% and 76.3% respectively. For osteoporosis classification, the AI achieved similarly robust results across both anatomical sites.

“Bone mineral density measurement is essential for screening and diagnosing osteoporosis, but limited access to diagnostic equipment means that millions of people worldwide may remain undiagnosed,” said corresponding author Dr Toru Moro from the University of Tokyo. “This AI system has the potential to transform routine clinical X-rays into a powerful tool for opportunistic screening, enabling earlier, broader, and more efficient detection of osteoporosis.”

Technical innovation addresses major healthcare challenge

The artificial neural network employs a sophisticated two-stage approach. Initially, a segmentation network identifies and isolates the spinal region in the X-ray image. Subsequently, a deep neural network estimates BMD values for both the visible lumbar spine and the non-visible femur, calculating T-scores that classify patients into normal, osteopenia, or osteoporosis categories.

The system’s ability to estimate femoral BMD from lumbar X-rays represents a particularly noteworthy achievement, given that femoral structures do not appear in the imaging field. This capability relies on the AI’s capacity to identify correlative features between spinal and femoral bone density patterns.

Performance analysis revealed mean absolute errors of 0.076 g/cm² for lumbar BMD estimation and 0.071 g/cm² for femoral BMD estimation when compared to dual-energy X-ray absorptiometry (DXA) measurements—the current gold standard for bone density assessment.

Addressing global healthcare accessibility

The research addresses a critical gap in osteoporosis diagnosis infrastructure. While

DXA equipment remains the preferred method for bone density measurement, its limited availability in many healthcare settings creates significant diagnostic barriers. Standard X-ray equipment, by contrast, has substantially higher coverage rates globally.

The authors noted that “approximately 619 million patients undergo X-ray examinations during the first orthopaedic service,” highlighting the enormous potential for opportunistic screening using existing healthcare infrastructure.

Validation across diverse populations

The study drew participants from the Research on Osteoarthritis/Osteoporosis Against Disability (ROAD) cohort, encompassing urban, mountainous, and coastal communities in Japan. This population-based approach strengthened the findings by including healthy individuals alongside those with established bone disease, reflecting real-world screening scenarios.

Analysis revealed that the AI system maintained consistent performance across different demographic groups, though some variations emerged. Male participants showed larger mean absolute errors but comparable relative error rates, while participants with severe osteoporosis demonstrated increased prediction errors – a pattern the researchers attributed to class imbalance in the training data.

Clinical implications and performance benchmarks

The system’s diagnostic accuracy compares favourably with conventional bone density measurement technologies. As the authors observed: “The femoral BMD estimation and classification performance of this study was equivalent to the conventional BMD measurement equipment reported in previous studies: the correlation coefficient, sensitivity, and specificity of radial DXA were approximately 0.46–0.69, 79%, and 71%.”

Attention heat map analysis revealed the AI’s focus on anatomically relevant regions, with lumbar estimates emphasising L1-L4 vertebrae and femoral predictions

This AI system has the potential to transform routine clinical X-rays into a powerful tool for opportunistic screening.

incorporating broader thoracic, lumbar, and pelvic features. However, the researchers identified limitations in cases involving compression fractures or extensive bone sclerosis, which could affect estimation accuracy.

Future directions and clinical translation

The research team acknowledges several methodological considerations for future development. Training data originated from specific imaging equipment and protocols, potentially limiting generalisability across different institutional settings. Additionally, the study’s exclusion of compression fracture data may affect real-world applicability.

The authors concluded: “This AI-assisted osteoporosis diagnostic system, using an anteroposterior lumbar X-ray image, could estimate the BMD of the lumbar spine and femur and classify patients with osteopenia and osteoporosis. The estimation accuracy for femoral BMD was acceptable, although lower than that for lumbar BMD.”

The system’s potential to identify high-risk individuals during routine radiographic examinations could facilitate earlier intervention and fracture prevention strategies. With osteoporosis affecting millions globally and carrying substantial healthcare costs, this technological advance offers promising prospects for improving diagnostic accessibility and patient outcomes.

The breakthrough represents a significant step towards integrating artificial intelligence into routine clinical practice, transforming everyday medical imaging into sophisticated diagnostic tools for bone health assessment. MEH

Reference:

Moro, T., Yoshimura, N., Saito, T., et. al. (2025). Development of artificial intelligence-assisted lumbar and femoral BMD estimation system using anteroposterior lumbar X-ray images. *Journal of Orthopaedic Research*, 43, 1619-1631. <https://doi.org/10.1002/jor.70000>

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Continuing medical education will be the fuel behind healthcare transformation in the Middle East

The GCC has lofty goals of future-proofing its nations through transformative healthcare models – models that rely on strategic continuing medical education.

Gulf Cooperation Council (GCC) countries have launched an ambitious initiative to reimagine healthcare across the region. Continuing medical education delivered through trusted technology providers will be critical in enabling the success of this goal.

As the region explores new methods of supporting the continuing medical education of its professionals, new relationships are emerging. The Oman Medical Specialty Board ^[1] now recognizes Continuing Medical Education (CME) credits awarded by the Accreditation Council for Continuing Medical Education (ACCME)-accredited technology providers. This type of relationship will play a pivotal role in developing clinical professionals fluent in the importance and application of evidence-based medicine.

A “moonshot” vision for healthcare transformation

While healthcare transformation is largely considered a “moonshot” in the GCC region ^[2] the ambition appears much more strategic and attainable when examined through the lens of its goals.

GCC healthcare transformation aims to support the health of future generations through the prioritization of high-quality, accessible, and affordable care in each nation. Governments across the region are working to lessen the economic burden of costs, improve the patient experience, and advance targeted therapies for rare and chronic diseases. The region is working to implement the Quadruple Aim of

1. Improved patient experience
2. Better outcomes

3. Enhanced health professional well being

4. Lower costs

To achieve these goals, leaders and clinicians need the tools to address suboptimal patient outcomes, coordinate care, and create clarity and order within their work. Achieving these will require clinical teams that are equipped with accurate, timely data and continuing medical education resources that help them deliver high-quality care.

The future of GCC health

Countries in the GCC are reimaging healthcare through population health programs, disease therapies targeted at chronic diseases, and improving speed to decision with AI technologies and big data. This is all accompanied by a shift to value-

based payments and care models that increasingly place the patient at the centre of the healthcare experience. As a result, care coordination stands out as a key goal in adapting their healthcare strategy.

Kingdom of Saudi Arabia

Saudi Arabia's Health Sector Transformation Programme focuses on individual health and patient centricity.

United Arab Emirates

In the United Arab Emirates, the National Strategy for Wellbeing 2031 is focused on quality of life that centres the individual in a holistic approach to health.

Qatar

The Qatar National Vision 2030 emphasizes human, social, environmental, and economic development – emphasizing the human development pillar through care coordination and personalized physical and mental care for prevention and curative healthcare.

Bahrain

Bahrain's Economic Vision 2030 emphasizes the use of technology to reduce chronic disease burden and adopt care coordination.

CME will be foundational to the GCC's success

The continuing education of medical professionals will be critical in supporting personalized health initiatives, population health goals, care coordination, and value-based decision making. Healthcare leaders should prioritize training and workforce development from multiple perspectives.

Evaluate the current workforce

Care coordination doesn't happen organically. Professionals will need training, support, and resources to develop skills, understand their role, and align their work with the overarching system.

Emphasize interprofessional collaboration

Addressing chronic conditions and lon-

gitudinal patient journeys requires medical professionals working from the same evidence-based information to coordinate as a team. When teams are working with aligned data and education, clear communication and collaboration are enabled, and clinicians can better support all arms of the Quadruple Aim.

Leverage data insights

Accurate and timely data on social determinants of health ^[3] should be available to all members of the care team across the entire care journey. This requires interoperable and integrated systems that make evidence-based information continuously available to all medical professionals.

Implement tech that aligns communication across the care team

Care coordination requires medical professionals who are speaking from the same evidence-based information. This level of alignment is critical in reforming health system navigation, creating an environment of patient centricity, and ensuring coordinated communication between all members of the care team.



Continuing medical education grounded in evidence-based medicine is the key to unified progress in healthcare transformation. This is why UpToDate® integrates CME earning directly into clinical workflows. It creates a seamless experience where users can focus on providing optimal care to patients while still meeting Continuing Professional Development (CPD) requirements.

The OMSB use case

The Oman Vision 2040 and Health Vision 2050 focus on primary care and efforts to reduce tertiary and quaternary care establishments.

As part of this vision, the Oman Medical Specialty Board (OMSB) has recognized CME credits awarded by providers accredited by the Accreditation Council for Continuing Medical Education (ACCME). The OMSB prides itself on a long-standing policy of recognizing international accrediting bodies that exemplify rigorous standards aligned with its own. This includes UpToDate, enabling healthcare professionals in the country to submit AMA PRA Category 1 Credit(s)™ to meet OMSB's CPD requirements. Organizations and clinicians using UpToDate gain access to benefits including:

- **Career development:** Earning ACCME-accredited credits improves the healthcare resume and makes professionals more attractive for promotions and new job opportunities, both at home and abroad.
- **Improved quality of care:** The effort of attaining CME credits improves clinical skills and knowledge and supports better patient outcomes and higher standards of care.
- **Enhanced compliance and recognition:** Since OMSB recognizes ACCME-accredited credits, healthcare professionals are ensured to meet requirements for maintaining licenses and certifications.
- **Expanded access to resources:** The evidence-based clinical information housed in UpToDate combines with ACCME-accredited CME activities to support informed decision-making and enhanced clinical practice.

Healthcare transformation starts with CME

Educated professionals are the foundation of a healthcare system that's built for future-proof nations and that supports generations of healthy citizens. Wolters Kluwer is proud to offer UpToDate as an evidence-based enhancement of clinical workflows – one that adds value not only to individual clinicians but to the region as a whole, both now and for years to come. MEH

Reference:

1. <https://omsb.gov.om>
2. <https://www.pwc.com/m1/en/industries/documents/a-golden-thread-to-transform-healthcare.pdf>
3. <https://www.wolterskluwer.com/en/solutions/health-language/social-determinants-of-health-sdoh-data>

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