MEDIA RELEASE

Getting a leg up on diabetic lower extremity amputation with new AI risk prediction model

Singapore, 7 May 2026 –Personalised risk-based monitoring may soon be the norm for patients with diabetes at high-risk of lower extremity amputation (LEA). Jointly developed by Singapore General Hospital (SGH), its parent organisation SingHealth, and the MOH Office for Healthcare Transformation (MOHT), this monitoring system harnesses artificial intelligence through a neural network model to enable earlier interventions, thereby reducing avoidable amputations.

Called Lower Extremity Amputation – Neural Network Model (LEA-Net), it aims to predict the risk of LEA three to five years before patients develop foot ulcers and infections, allowing care teams to intervene before irreversible tissue damage occurs. The model categorises patients into low- and high-risk groups, facilitating targeted interventions for higher-risk patients and reducing their wait times to see vascular specialists through an optimised referral process.

LEA refers to amputations below the knee, and is most commonly caused by diabetes, arising from complications such as diabetic foot ulcer, peripheral artery disease, and diabetic neuropathy. In Singapore, close to nine in 10 individuals who had an LEA have diabetes, with about 85 per cent of cases preceded by foot ulcers.

Professor Chong Tze Tec, Head and Senior Consultant, Department of Vascular Surgery, SGH, said, “Patients with diabetes undergo annual screenings for foot health, renal function and eye health separately. However, compliance rate for diabetic foot screening is the lowest of the three. Many patients only seek medical attention when a wound or infection is already present, increasing the possibility of amputation and associated risks such as surgical complications and death.”

LEA can be devastating for patients because it affects every dimension of a person’s life: mobility, independence, identity, relationships, and health. Activities of Daily Living become a great challenge. Patients may feel they have lost control over their lives, which deeply affects confidence and self-image. Patients with diabetes or vascular disease who have undergone an LEA also face an added risk of wound complications and potential loss of the other limb.

The financial implications are also significant. The team found that early-stage interventions average about $25,000, whilst late-stage treatments can exceed $40,000 to $50,000 per patient. Proper care and early intervention could prevent these costs whilst improving outcomes in limb-salvage care and preserving patients’ quality of life and independence.

Mr Ivan Tan, Director, Group Finance Analytics, SingHealth, said, “The later patients present with diabetic foot complications requiring amputation, the greater the financial and resource burden on both patients and healthcare systems. Results from the model show that we can identify high-risk patients during the critical window before ulceration and infection develop. This can potentially shape diabetic foot screening guidelines for the future.”

Currently, diabetic foot assessments are based on physical findings, and interventions typically occur after ulceration or infection develops, rather than predicting future risk.

Model Development and Performance

LEA-Net was developed using anonymised data from over 580,000 SingHealth patient records over two and a half years, building off a chronic disease progression model created by the Data, Science and Technology team at MOHT. It incorporates demographics such as age, sex, clinical conditions including hypertension and chronic kidney disease, as well as lab test and imaging scan results. Validation on approximately 250,000 additional patient records demonstrated a sensitivity rate of nearly 80 per cent and specificity rate of close to 90 per cent for LEA prediction, outperforming other benchmarking models on both measures[1].

Under LEA-Net, patients pegged as high-risk will undergo diabetic foot screening every three to six months, with early referral to podiatry or vascular specialists for necessary intervention. Patients deemed low-risk continue to have diabetic foot screenings yearly and scheduled tests, which enable the care team to intervene when there is a change in status.

Dr Shalabh Srivastava, Data Scientist at MOHT, said, "LEA-Net reflects the shift towards anticipatory, data-driven care under Healthier SG, where we move from reacting to complications to preventing them before they occur. By identifying high-risk individuals early, we can personalise care pathways and optimise specialist resources at the population level, reducing avoidable amputations and improving outcomes in limb-salvage care. Importantly, the model has been designed to produce reliable and clinically interpretable risk estimates, enabling care teams to act on these insights with confidence."

The LEA-Net Model was presented at the International Consortium for Health Outcomes Measurement (ICHOM) Conference 2025 in Dublin, Ireland and won the People's Choice Award – determined through popular vote by conference attendees. Moving forward, the team is looking to further validate the model's clinical efficacy with a pilot study involving patients from SingHealth's Diabetes Registry.

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[1] Sensitivity refers to how many patients the model will correctly identify as high-risk, while specificity refers to how many patients the model will correctly identify as low-risk.

About Singapore General Hospital (SGH)
Singapore General Hospital, established in 1821, is the largest tertiary hospital in Singapore and consistently ranked among the 10 best hospitals worldwide. It provides the most comprehensive patient-centred care with over 50 clinical specialties on its campus. As an Academic Medical Centre, it takes pride in training healthcare professionals and conducting cutting edge research to meet evolving needs of the nation as well as the region. Driven by a strong sense of purpose, SGH is committed to give of its best to heal and bring hope, as it has for over 200 years.

For more information, please visit www.sgh.com.sg

About Singapore Health Services (SingHealth)

SingHealth, Singapore's largest public healthcare cluster, is committed to providing affordable, accessible and quality healthcare to patients. With a network of acute hospitals, national specialty centres, polyclinics and community hospitals offering over 40 clinical specialties, it delivers comprehensive, multidisciplinary and integrated care. Beyond hospital walls, SingHealth partners community care providers to enable the population to keep well, get well and live well. As part of the SingHealth Duke-NUS Academic Medical Centre, SingHealth also focuses on advancing education and research to continuously improve care outcomes for patients. For more information, please visit: www.singhealth.com.sg

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About MOH Office for Healthcare Transformation (MOHT)

The MOH Office for Healthcare Transformation (MOHT) is MOH's innovation partner for system-level healthcare transformation in Singapore. MOHT works with partners to de-risk, validate and scale solutions that drive real-world system change. We believe the future of healthcare in Singapore should shift from volume to value, empower patients and providers, and become more adaptive and integrated,

so that care can increasingly be delivered in the right place, at the right time, by the right team. By bridging evidence-based translation and policy-ops-tech capabilities, and convening stakeholders to mobilise the right capabilities, MOHT helps accelerate the deployment and embedding of promising care models into mainstream care in Singapore. For more information, please visit www.moht.com.sg