EMBARGOED UNTIL 4 JULY 2024, 10.30AM

FACT SHEET

THE NATIONAL HEALTHCARE INNOVATION PRODUCTIVITY MEDALS 2024

Organised by the Centre for Healthcare Innovation (CHI) and supported by the Ministry of Health as well as the Ng Teng Fong Healthcare Innovation Programme, the **National Healthcare Innovation Productivity (HIP) Medals** encourage ground up innovations that increase productivity and efficiency while reducing waste and cost.

This year's National HIP Medals will be awarded to 10 winners from public healthcare institutions for their innovations in Care Redesign, Automation IT and Robotics, Workforce Transformation, and Adoption this year. As part of the opening ceremony, **Guest-of-Honour, Grace Fu, Minister for Sustainability and the Environment** will be presenting the National HIP Medals to the respective winners.

This year's top award, the Excellence Champion Medal, will be awarded to Alexandra Hospital for its transitional Compassionate Discharges (ComD) programme. ComD programme provides seamless care transition with support outside office hours for critically ill patients with a short life expectancy, allowing them to be discharged home for end-of-life care. It has shown positive outcomes, including a reduction in average stay length and an increase in the number of palliative care patients participating in the programme.

The full list of awards winners is as below:

Excellence Champion Medal
Alexandra Hospital
Project: Palliative Response Team: Increasing Compassionate Discharges (ComD) Success

Despite Singapore's rapidly aging population, a 2013 Lien Foundation survey revealed a significant gap: 77% of Singaporeans wish to pass on at home, but only 27% of them get to do so.

Aiming to address this disparity, the Ministry of Health (MOH) has announced a goal to reduce in-hospital deaths from 61% to 51% by 2027. Expanding access to compassionate discharge (ComD) is a key strategy to achieve this objective. It allows critically ill patients with a short life expectancy to be discharged home for end-of-life care. Unfortunately, many deaths occur in the hospital due to delays in discharge and limited after-hours hospice support.

The Alexandra Hospital takes up this challenge by setting up a transitional ComD programme with a multidisciplinary team that has come together to provide seamless care transition for ComD, supporting it outside office hours to address the gap in current hospice service in Singapore.

When Alexandra Hospital (AH) initiated their programme, hospice services were constrained and were unable to accommodate ComD outside regular hours. Consequently, patients faced significantly restricted options for home-based care during their final days.

The inpatient hospital primary team lacked the time and confidence to prepare for ComD as the process is time consuming and requires lengthy coordination.

Thus far, the ComD programme has led to a reduction in an average stay length of 3.5 days and an increase of palliative care patients who underwent ComD from 1.0% in 2020 to 7.4% in 2023.

Media Contact: Susan Koh

Email: susan_koh@nuhs.com.sg

Best Practice Medal (Care Redesign)

Singapore General Hospital / National Neuroscience Institute

Project: Reducing Door-to-Puncture Time for Endovascular Thrombectomy in Stroke

Endovascular Thrombectomy (EVT) is a treatment involving the removal of blood clots to re-establish cerebral blood flow during an acute ischemic stroke, for which Singapore General Hospital (SGH) has administered treatment to more than 200 patients per year.

The baseline median time taken to start EVT for acute stroke patients presenting at SGH's Emergency Department was 130 minutes (door-to-puncture time). For every 60-minute delay, patients have a 15-20% worse functional outcome at 90 days, with net monetary loss for the hospital/patients estimated at S$26,255 per hour.

This project aims to look into streamlining the decision workflow on EVT treatment, thereby leading to a reduction in the median time taken to start EVT to 82 minutes (37% reduction) instead. This translates to improved patient outcomes and a reduced rate of disability. The team has since shared the best practices and processes gained from this project so that this improvement can be implemented in other EVT centres in Singapore to benefit all acute stroke patients who require EVT treatment.

Media Contact: Ms Candice Lee Li Fen

Tel: 9146 3107

Email: candice.lee.l.f@sgh.com.sg

National Heart Centre Singapore

Project: Prevention of Kinkage Distal Perfusion Catheter for ECMO Circuit

The huge Extracorporeal Membrane Oxygenation (ECMO) cannulas occludes 70% to 80% of the arteries' lumen, limiting the amount of blood perfusing the distal limbs and causing pressure to build up within the muscles.

In some cases, fasciotomy—a procedure in which the fascia is cut in the muscle compartment—is required to relieve the swelling in the lower limbs. The contraction of the peripheral vessels caused by large doses of vasoactive agents and poor cardiac output further worsens limb ischemia. The undesirable impact of vascular complications such as loss of limb negatively affects survival and quality of life and increases hospitalization stay. Generally, it amplifies the risk of hospital-acquired infections and disrupts patient flow and access to care due to bed shortages.

The project team thus came up with a series of Distal Perfusion Catheter (DPC) securement to prevent kinking, resulting in a new prototype 'DPC organizer' with secure DPC fitting within the organiser to prevent bends and kinks.

The 'DPC organizer' prototype reduces the risk of dislodging DPC, ECMO cannula, and other invasive lines and causes zero kinked DPC incidence. Good scores for lower limb circulation tests have been achieved along with it. This implementation has saved 410 nursing man-hours per annum.

Media Contact: Ms Belinda Lim Siew Mui

Tel: 6704 2386

Email: belinda.lim.s.m@nhcs.com.sg

Tan Tock Seng Hospital

Project: Advanced Practice Physiotherapists in TTSH Emergency Department

In 2022, a total of 19,000 potential musculoskeletal (MSK) cases were managed in Tan Tock Seng Hospital Emergency Department (TTSH ED), contributing to the high workload in ED. MSK patients are subjected to a long waiting time of up to 196 minutes before they receive necessary physiotherapy care and have a long ED stay of up to 268 minutes before discharge as the traditional care model mandates a doctor's assessment before referral to physiotherapy services.

Multiple touchpoints and prolonged wait times impact patient well-being and strain healthcare resources. Thus, there is a need to improve MSK patient care in ED for both patients and the healthcare system. Five TTSH departments collaborated to introduce the ED Advanced Practice Physiotherapist (APP) care model, which is inspired by successful international practices. The new model enables trained ED APPs to promptly assess and provide care to MSK patients post nursing triage, optimising ED resource utilisation and allowing doctors to prioritise urgent medical needs, signifying a significant leap forward in patient care. Training in TTSH ED staff was completed in May 2022, with full-scale implementation of the ED APP service in June 2022.

From June 2022 to December 2023, 463 patients have benefited from the ED APP care model, which has led to a significant reduction in wait time by 75% and a reduction in throughput time by 28%. This new model showcases a transformative impact on patient care and resource optimisation.

Media Contact: Ms Kristen Lee

Tel: 6357 8419

Email: kristen_sh_lee@ttsh.com.sg

Best Practice Medal (Automation, IT & Robotics Innovation)

Ng Teng Fong General Hospital

Project: Automated Code Red Alerts (ACRA) and ICU Outreach Nursing (ICUORN) Service

In the past, the absence of a systematic approach to detect early deterioration in patients' conditions led to an inadvertent oversight of early signs of deterioration, causing delays in interventions and care escalations. Upon analysis of incidence reports, a multidisciplinary team of clinicians and nurses pinpointed several contributing factors, including inadequate response to symptoms, failure to recognise deteriorating vital signs, the absence of a rapid response system, a lack of automated triggers for patients' vital abnormalities, and insufficient ICU nurse support.

To address these issues, the team developed the ACRA system, an automated early recognition and alert triggering system for patients at risk of deterioration in the general ward. This minimised human errors and oversights, ensuring timely alert notifications to senior clinicians. Additionally, the team implemented a job redesign initiative, upskilling ICU nurses into ICUORNs to provide critical expert support to acutely ill patients in the general ward. By aligning with the National Early Warning Score 2 (NEWS2) system, this approach not only improved patient care but also minimised preventable morbidity and mortality.

The implementation of these solutions resulted in notable improvements in patient outcomes, including a 100% compliance rate in escalating care to the appropriate clinicians, a reduction in the incidence of In-Hospital Cardiac Arrest (IHCA), and fewer ICU/HD admissions. Beyond enhancing system efficiencies, the team's efforts also led to significant patient care transformation by redesigning jobs and upskilling ICU nurses into ICUORNs who extended support to acutely ill patients in the general wards, minimising preventable morbidity and mortality.

Media Contact: Mr John Li

Tel: 6716 5846

Email: john_cl_li@nuhs.edu.sg

National University Hospital

Project: Leveraging Endeavour AI to Eliminate Redundant CT Studies Performed

Redundant CT scans are a significant issue in healthcare, leading to unnecessary costs, radiation exposure, and resource utilisation. An audit within the project's institution revealed 211 redundant CT exams over 20 months, attributed to fragmented care and inefficient vetting processes. The project team thus aimed to address the issue through the introduction of the NUHS EAI platform.

The Endeavour AI (EAI) platform, designed by NUHS, is a EMR digital twin with TIBCO Spotfire App layered as a low-code platform that empowers and enables domain expert end-user to solve their important issues. It can process patient data from electronic health records to identify potential duplicate CT examinations. It utilises rule-based codes for real-time vetting, highlighting duplicates for cancellation or further investigation, thus streamlining the process and reducing reliance on manual vetting.

This demonstrates the platform's effectiveness, accessibility, customizability, and scalability, offering significant improvements in reducing redundant CT studies. The team observed that prior

to EAI's implementation, the manual process required a CT radiographer to check for duplicate scans 120 minutes per day. After EAI's implementation in August 2023, the number of forms to be checked has decreased by approximately 90%, resulting in 90% reduction in vetting time or approximately 108 minutes per day while maintaining an accuracy with NPV of 99%. These results demonstrate significant productivity gains and cost savings along with increased safety, with potential for further improvement as the system evolves.

Process automation is the strongest factor for sustainability. This new solution is automated with no major modification to the existing workflows and does not require sustained human behavioural shifts in making this future-proof.

Media Contact: Ms Joan Chew, Group Comms, NUHS

Tel: 9752 1209

Email: joan_chew@nuhs.edu.sg

Best Practice Medal (Workforce Transformation)

Ng Teng Fong General Hospital

Project: Vertical Integration of Hardware and Software Automation in Pharmacy (VIP)

The Outpatient Pharmacy at Ng Teng Fong General Hospital (NTFGH), which serves an average of 650 to 700 patients/day, faced teething issues with the adoption of automation due to inherent flexibility with the traditional horizontal integration model. The heavy reliance on external parties for the provision of automation-related services limited the overall agility and efficiency of the pharmacy and discouraged innovation.

This project aimed to adopt the vertical integration of hardware (i.e., OPAS) and software automation (i.e., RPA) capabilities and data visualisation within NTFGH's Outpatient Pharmacy to improve efficiency and foster innovation.

The project has also led to workforce transformation whereby pharmacy staff are deployed to perform high-value tasks and are trained to identify the core skills on the automation of software and relevant troubleshooting and project management.

This transformation has led to zero OPAS-related medication error, with over 330,000 medications packed. since its initiation in December 2021, saving 585 man-hours.

Media Contact: Mr John Li

Tel: 6716 5846

Email: john_cl_li@nuhs.edu.sg

Bright Hill Evergreen Home

Project: Project ESCAPE – Empowering Senior Care Aides through Prospects and Education

The Bright Hill Evergreen Home (BHEH) faced two primary workforce challenges: a high attrition rate in nurses (27%) and a high percentage of nursing aides (80%) who are unable to progress career wise to become registered nurses due to an inability to meet requirements set by Singapore Nursing Board (SNB), despite being trained nurses in their home countries.

Project ESCAPE is an ongoing job redesigning project that identifies suitable care aides who can receive upskilling and capability building to take on certain roles that are traditionally taken on by higher leveled staff. It creates career progression for nursing aides to become senior nursing aides, thus allowing senior nursing aides more bandwidth to assist nurses with non-clinical duties.

This workforce transformation has led to a reduction in attrition rate of 10%, an increase in job satisfaction and motivation in trained nurses and senior nursing aides, and a cost saving of $324,000 per annum.

Media Contact: Ms Zoey Choo, Corporate Comms, BHEH

Tel: 6459 3492 (ext 304)

Email: zoey.choo@bheh.org

Best Adopter Medal

Singapore General Hospital

Project: Value-based Introduction of Exoskeletons for Gait Rehabilitation in Physiotherapy

At Singapore General Hospital (SGH), stroke survivors make up 70% of the ward occupancy in the inpatient rehabilitation unit. Despite this high volume of stroke survivors, only usual care was provided. The most common presentation post stroke is the loss of muscle strength, causing gait disability and a loss of independence.

Traditional rehabilitation methods may fall short in providing adequate assistance for restoring walking ability. The resource-intensive nature of conventional therapy approaches can also strain healthcare systems and limit access to rehabilitation services to those in need.

With the findings from IMOVE and the Australian and New Zealand living clinical guidelines advocating for increased opportunities for stroke survivors to engage in repetitive walking practice, the project team sought to address this need by integrating Robotic Assisted Gait Rehabilitation (RAGR) within the inpatient rehabilitation unit since April 2022, specifically utilising the Hybrid Assistive Limb (HAL) exoskeleton. The HAL is a wearable exoskeleton that can detect voluntary contractions and assist the wearer in moving.

The team sought buy-in from key stakeholders through comprehensive presentations that highlighted the benefits and potential impact of introducing RAGR. Staff training and capability building were prioritised to ensure proficiency in integrating RAGR into the rehabilitation protocols. This involved identifying a service champion and training the trainer programme. The team started at 50% of the target workload and took six months before it reached its full workload of six to seven patients per day, or 128 attendances per month.

In the first year, RAGR service has exceeded the targeted workload and those receiving this service have shown greater improvement in their mobility scales compared to those under usual care by 3.89 points. The implementation also shows that 50% of the patients receiving HAL can be attended to by support staff without a physiotherapist, translating to manpower avoidance.

Media Contact: Ms Candice Lee Li Fen

Tel: 9146 3107

Email: candice.lee.l.f@sgh.com.sg

St. Andrew's Community Hospital

Project: Implementing Value-Based Care for St. Andrew's Community Hospital

In 2018, Changi General Hospital (CGH) and St. Andrew's Community Hospital (SACH) started joint value-based care initiatives to streamline workflow and reduce the length of stay (LOS) at CGH. Fast-track referrals for Total Knee Replacement (TKR) and Stroke patients from CGH to SACH were undertaken at this start of SACH's value-based care journey.

In 2021, SACH's Senior Management reorganised the Healthcare Performance Office (HPO).

In 2022, SACH adopted the National University Health System (NUHS)' award-winning Value-Driven Outcome (VDO) concept and framework to guide the definitions of individualised of Clinical Quality Indicators (CQIs) for each condition from the four key dimensions: Clinical Quality and Safety, Appropriateness of Care, Patient Reported Outcomes, and Patient Experience.

Through various data sources, the team came up with a complex calculation for cost structure with support from the IT team. Staff training and resources were garnered for the adoption of VDO, focussing on skill sets on lean and clinical QIs, design thinking, and productivity and costing.

With the adoption of the VDO solution to the institution in 2023, the team observed an improvement in CQI for hip fracture and stroke care by 26.1% and 23.8%, respectively, compared to pre-implementation. Through attention to various clinical care path streams, there has been a progressive shortening of length of stay, with resultant shortened wait times to admission. This translates to an annual cost avoidance of $553,000, achieved through the preservation of 5.8 beds per day.

Media Contact: Ms Peh Lay Koon

Email: laykoon_peh@sach.org.sg

=END=

For media queries, please contact:

c/o National Healthcare Group
Dionne Seah
Group Corporate Communications
Tel: +65 9675 7569 / +65 6496 6268
Email: Dionne_PX_Seah@nhg.com.sg

About Centre for Healthcare Innovation

The Centre for Healthcare Innovation (CHI) drives systems transformation to add years of healthy life to the communities we serve. This transformation is powered by our understanding of the innovation cycle — beginning with care redesign, augmented by effective technology adoption, and ultimately engendering job redesign for our future workforce. CHI aims to transform health by delivering greater value at the care level;

enabling health and social change for population health at the systems level; and empowering sustainable healthcare at the ecosystem level.

For more information, visit us at: www.chi.sg