Academic Medicine Innovation Institute
SingHealth Duke-NUS

SingHealth DukeNUS ACADEMIC MEDICAL CENTRE

Alice Lee Innovation Centre of Excellence

ACCELERATING HEALTHCARE



EXCLUSIVE INTERVIEWS

Dr Barbara Helen Rosario on Validation of a Frailty Risk Tool at Changi General Hospital

Highlights of the event on Venture Capital Funding

Venture Capital perspectives on Startups fundings

Introduction

Healthcare is undergoing rapid transformation through innovations like AI-driven solutions, precision medicine, and value-based care, making services more efficient and patient-focused. Yet, turning these innovations into real-world impact is difficult due to regulatory, financial, and integration barriers.

To overcome these challenges, collaboration among startups, investors, providers, and policymakers is essential. Creating an ecosystem that supports rapid development, testing, and scaling of new solutions is key.

By leveraging partnerships, targeted investments, and data insights, the healthcare sector can accelerate innovation and ensure that cutting-edge advancements benefit patients and improve outcomes on a global scale.

Implementation of the Hospital Frailty Risk Score at Changi General Hospital

PI: Dr Barbara Helen Rosario, Geriatric Medicine, Changi General Hospital

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CGH CAMPUS

What is frailty and importance of frailty

Frailty is a medical syndrome characterised by decreased physiological reserve and increased vulnerability to stressors in older adults. It's recognisable by symptoms such as unintentional weight loss, weakness, slow walking speed, low physical activity, and exhaustion.

Why consider frailty as a vital sign?

Changi General Hospital has included frailty as a "vital sign" which attributes frailty screening the same importance as measuring blood pressure or pulse, and care is adapted based on the findings. In essence, frailty becomes a routine assessment that helps to improve the overall health management of older adults and people with chronic conditions, ultimately contributing to better healthcare outcomes.

Importance of recognising frailty:

- **Prevention**
- **Early Detection**
- **Care Planning**
- **Personalised Care**
- **Improved Health Outcomes**
- **Improved Quality of Life**
- **Reduce Healthcare Costs**

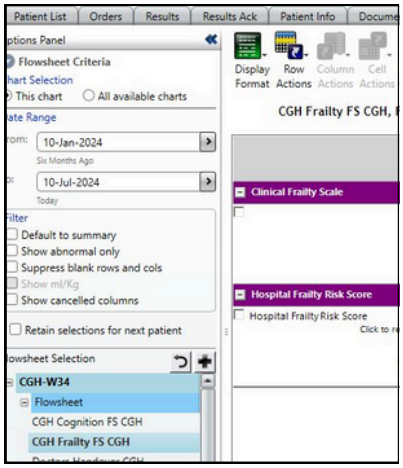
How is frailty measured?

Frailty can be assessed using several tools or indices, the most common being:

- **Fried's Frailty Criteria**
- **Clinical Frailty Scale**

About the modified Hospital Frailty Risk Score (mHFRS)

The modified Hospital Frailty Risk Score (mHFRS) is an innovative tool designed to identify frailty risk in hospitalised patients using routinely collected electronic health record data. It analyses International Classification of Diseases (ICD-10) diagnostic codes to assign a frailty risk score of low, intermediate or high risk of frailty and is based on the HFRS that was developed by researchers at the University of Leicester. This automated approach allows for rapid, frailty risk screening without requiring a clinical evaluation, making it particularly useful in busy hospital settings. However, mHFRS can only be scored if the patient has had prior healthcare contact in the preceding 2 years and is currently available typically by 24 hours and within 7 days of hospital admission but efforts are underway to make it available earlier. About half of hospitalised patient can be scored.



Adoption of mHFRS at CGH

CGH has integrated the mHFRS into the electronic medical records (EMR) system, marking a significant advancement in our frailty management approach. By integrating our frailty workflow with a multidisciplinary team (MDT) approach, we can:

1. Identify frailty early: which enables real-time assessment of frailty risk as the patients interact with the hospital system. This early identification of frailty during hospitalisation is crucial as it allows appropriate care plans and frailty interventions to be initiated for the patients.

2. Provide Age Friendly Healthcare Systems: having the mHFRS readily available in the EMR, healthcare providers across various disciplines can quickly identify patients who may benefit from early specialist intervention. This allows for prompt and targeted care for those at higher risk of frailty-related complications and planning of onward care to slow and reverse frailty in its early stages and to manage frailty in its later stages.

3. Reduce emergency admissions and hospitalisations.

4. Enhance quality of life and independence: encourage exercise, dietary, and pharmacological interventions for frailty beyond hospital. Social workers and community services can ensure that older adults receive the necessary home care, reducing reliance on hospitals.

Frailty Research

(Click on the relevant study header for more details.)

Study 1: Validation of the HFRS in older adults hospitalised with community-acquired pneumonia

Study 2: Validation of Hospital Frailty Risk Score in Heart Failure

Study 3: Frailty-aware surgical care: Validation of Hospital Frailty Risk Score (HFRS) in older surgical patients

Study 4: Modified Hospital Frailty Risk Score (mHFRS) as a Tool to Identify and Predict Outcomes for Hospitalised Older Adults at Risk of Frailty

Study 5: Data Driven and Artificial Intelligence (AI) based approach for frailty biomarker detection from CT scans

By identifying frailty early, conducting comprehensive assessments, and implementing personalised, multidisciplinary interventions, healthcare teams can help older adults maintain function, prevent complications, and improve their overall well-being.

Acknowledgement

- Changi General Hospital Frailty Team
- SingHealth Duke-NUS Academic Medical Centre
- UK Acute Frailty Network
- Synapxe Pte Ltd

FOR MORE INFORMATION, PLEASE CONTACT CGH OFFICE OF INNOVATION AT INNOVATION@CGH.COM.SG

Fueling Innovation: Venture Funding Insights for Accelerating Healthcare

ON 21ST MARCH 2025, A.L.I.C.E @ SGH CAMPUS AND NATIONAL HEALTH INNOVATION CENTRE SINGAPORE (NHIC) CONVENED INDUSTRY EXPERTS AND INNOVATORS FOR AN ENGAGING PANEL DISCUSSION ON VENTURE FUNDING STRATEGIES TO DRIVE HEALTHCARE INNOVATION FORWARD.



The acceleration of healthcare innovation calls for early insights into what venture capitalists (VCs) look for in a startup. Director of NHIC, Dr. Pauline Tay, moderated a thought-provoking panel with experts Mr Anselm Tan (ClavystBio), Mr Remi Choong (elev8.vc), and Dr. Yong Chern Chet (22Health), who shared valuable lessons on navigating the world of healthtech funding. From identifying untapped market opportunities to building an exceptional "A team" and understanding the interplay between venture capital and public grants, the discussion illuminated the pathways to success in this fast-evolving field.

The session highlighted the different flavours of VCs and their unanimous agreement that healthtech investment requires a long gestation period and huge capital outlay, but outcomes are deeply meaningful and impactful. While investors appreciate great technology, they pay close attention to teams driven by a strong mission to solve significant healthcare problems.



(From Left to Right) Dr. Pauline Tay (Director of NHIC), Mr Anselm Tan (ClavystBio), Mr Remi Choong (elev8.vc), Dr. Yong Chern Chet (22Health) and Dr Chong May Anne (Co-Director of A.L.I.C.E @ SGH Campus

> **In essence, HealthTech ventures require a well-rounded combination of tech, skills (clinical, technical and commercial) and traits to navigate funding challenges and bring impactful solutions to the healthcare market.**
>
> PAULINE TAY (PHD)
> DIRECTOR
> NATIONAL HEALTH INNOVATION CENTRE
> SINGAPORE (NHIC)

What Investors look for when assessing projects and assets for investment:

- **Purpose & Impact:** Clear mission in addressing major healthcare challenges and critical unmet clinical needs, improving patient outcomes, productivity, or reducing costs.
- **Clinical Evidence:** Strong data proving real-world evidence on solving a healthcare need and can be adopted into clinical workflows.
- **IP & Future Growth:** Innovations with strong intellectual property (IP) differentiation, high barrier to entry with large market potential (FIP).
- **Market Clarity:** Clear business plan, models and go-to market strategies with understanding on the different outcomes for acquisition or IPO.
- **A Clear Cap Table considering Diverse Various Capital Sources:** Balance VC, corporate and strategic investors, family offices and HNWIs to manage risks.
- **Founder/Team Mindset:** Passionate, resilient founders with long-term vision and the ability to navigate constraints for disruptive innovation.

22Health Ventures is an early stage healthtech investment firm, founded by proven entrepreneurs and deeply embedded in SG. Focusing on experienced founders with differentiated operating models across Asia and the U.S., we empower startups with accelerated access to the U.S. market.

How does 22Health Ventures able to assist within the healthcare ecosystem?

22Health Ventures focus on early stage healthtech companies, they actively derisk their portfolio investments by making deliberate efforts to develop potential founders via their "value-add" mentorship framework and offerings with the intention of creating familiarity with the US healthcare system. The objective is to empower SG startups to compete globally.



Dr. Yong Chern Chet
(MB BCh, MRCSEd, MPS)
Head of Asia Ecosystem at 22Health Ventures.

How did the 'Insight into Venture Funding' event benefit 22 Health Ventures?

As a Venture Capital fund, 22 Health Ventures appreciate the importance in nurturing a thriving startup ecosystem. This means besides funding, what is needed at the table is access to expertise, mentorship and a broader network of industry and ecosystem partners (from the public sector as well as the private players) and invaluably to other experienced founders included especially for early-stage companies. Investing after all is a people business and any opportunity to meet and interact with others is always beneficial.

What advice would you give to startups looking to secure venture capital funding for innovative ideas, especially those that challenge traditional market norms?

"Beyond the mission, idea and development of the product it is important for the founders/startup to demonstrate to potential investors that they have clarity on how they are intending to go-to-market and what is the "exit" that they have in mind. Jeff Bezos or Amazon famously likes to refer to this thinking as their "Working Backwards" method. Better still if one is able to show good traction over time regardless of which stage their startup is in.
Do note that VC funding is not the only form of capital out there. Many leading foundations do have the potential to play a catalytic role in providing risk capital, allowing startups to gather proof of concept points/data and build credibility to subsequently attract other types of investors including direct investments from Family Offices (FOs) or conglomerates if what is being innovated is aligned with their investment themes/causers that they champion."



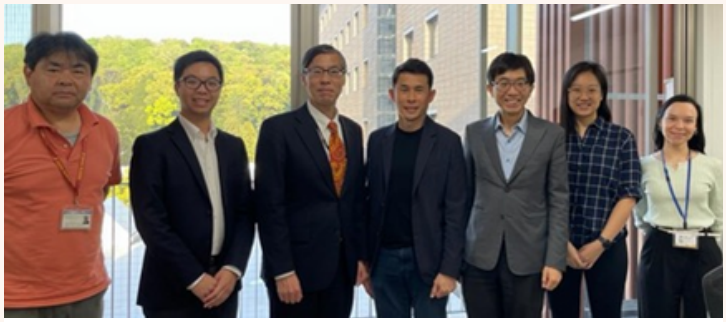
Origgin
SUCCESS STARTS HERE

Origgin Ventures possesses a unique blend of capabilities that make us a valuable partner to healthcare companies.

- **Early-Stage Investment**
- **Market Expansion Expertise**
- **Strategic Partnerships**
- **Commercialisation Guidance**

The acceleration of healthcare, especially through global market expansion, has never been more important. As technology advances, so does the opportunity to make healthcare systems more efficient, affordable, and accessible. Accelerating healthcare is about more than just introducing new technologies—it's about creating a global healthcare ecosystem that delivers value to patients, healthcare providers, and economies. By expanding healthcare solutions into high-growth regions like China, Thailand, Malaysia, and Japan, we can enhance access to quality care, particularly in rapidly developing markets. These countries have diverse healthcare needs, and there is immense potential for innovative solutions—such as telemedicine, AI-driven diagnostics, and advanced medical devices—to make a significant impact. The global expansion of healthcare technologies also enables economies of scale, which can lead to cost reductions, greater patient reach, and more efficient healthcare delivery systems. By speeding up the commercialisation of health technologies across borders, we create opportunities for improved health outcomes and a more interconnected healthcare ecosystem.

Origgin Ventures is a venture capital firm that specialises in early-stage investments in deep-tech innovations, with a particular focus on healthcare technologies. They work closely with startups that are developing cutting-edge solutions, particularly those originating from academic research. Their goal is to bridge the gap between groundbreaking university-based technologies and the marketplace, helping companies commercialise their innovations and scale globally. By leveraging our extensive network and expertise, we help healthcare companies expand into high-growth markets in Asia, including China, Thailand, Malaysia, and Japan. Origgin Ventures aim is to empower healthcare startups by providing them with the financial resources, strategic support, and global market access necessary to succeed. Origgin Ventures focuses on helping healthcare companies transform their innovative ideas into scalable solutions that can improve patient care, reduce healthcare costs, and optimise system efficiencies. By connecting these companies with key partners and industry leaders, they aim to accelerate their growth and ensure to reach the largest markets globally.



How Origgin Ventures Assists Healthcare Companies Expanding into Key Asian Markets?

Origgin Ventures helps healthcare companies navigate regulatory and cultural challenges in high-growth Asian markets like China, Thailand, Malaysia, and Japan.

- **Navigating Regulatory Landscapes**
- **Building Strategic Partnerships in Asia**
- **Cultural and Market Adaptation**
- **Access to Market Intelligence**
- **Facilitating Regional Distribution and Supply Chain Management**

Events at A.L.I.C.E @ SGH Campus

A.L.I.C.E @ SGH Campus is designed to foster forward-thinking solutions and drive the continuous growth of innovation. Events held here aim to spark creativity and collaboration, keeping us at the forefront of innovation.



- Yarrow Medical Holdings Pte Ltd
- A.L.I.C.E @ SGH Campus



- Future Health System, SGH
- A.L.I.C.E @ SGH Campus

Biannual Partners Networking Event

The A.L.I.C.E @ SGH Campus hosted its biannual Partners Networking Event to strengthen collaborations between external partners and SingHealth stakeholders. The event fostered the exchange of ideas among experts and decision-makers, paving the way for future collaborations to advance patient care, research, and healthcare delivery.







Healthcare Innovator: Elements of Commercialisation
(Co-Organised with Asia Regulatory Professionals Association (ARPA))







Visits by the National Library Board, Singapore Economic Development Board and Khoo Teck Puat Hospital
(From Left to Right)

Stay connected with us on LinkedIn! Scan the QR code or click the link for the latest updates on A.L.I.C.E @ SGH Campus events.

OUR PARTNERS

