Virtual Hospital:

Transforming Service Delivery to Adapt to the Evolving Needs of an Ageing Population

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ELDERLY. FRAIL. Diabetic. Hypertensive. These keywords fittingly describe 1.4% of patients admitted to Tan Tock Seng Hospital (TTSH) in 2011. Such patients often presented with challenging and complex chronic disease issues, and consumed five times their number in resources – a whopping 6.8% of inpatient episodes, and 7.5% of total hospital bed days that year. That year, 3.8% of the episodes also culminated in a stay at one of TTSH's post-acute wards. Many of these patients required hospital admission several times a year, perhaps indicating that they had underlying issues that were yet to be uncovered and resolved. A term was coined for this group of patients – frequent admitters (FAs).

TTSH was resolved to find a better way to tackle this phenomenon.

Looking abroad

Extensive reviews were conducted on mature systems of care outside of Singapore, as there was no local precedent. The following systems of care handle an almost identical patient population as what TTSH faced. Among the systems studied were the Torbay Care Trust and North West London Integrated Care Pilot project from the UK; the integrated virtual care and call centre system under the Health Authority of Hong Kong, China; and the Toronto East Virtual Ward programme from Canada.

"...the key to better, more appropriate and yet affordable and sustainable healthcare is a transformation in care delivery to better meet the evolving needs of an ageing population."

– Minister for Health, Mr Gan Kim Yong (in his opening address at the Singapore Health & Biomedical Congress 2014 in September)

Several similarities were found among the abovementioned programmes, namely:

- Doctors act as advisors overseers, and not as doers;
- Health managers (HMs) co-create care services for patients;
- Effective telecommunications;
- Integration of multiple social and healthcare resources; and
- Constant resource titration to suit individual patients' needs.

Thinking local

As a result of this analysis, the TTSH Virtual Hospital (VH) team was set up in August 2012 to address the needs of FAs, using the two strongest predictors from a healthcare model designed by the National Healthcare Group's (NHG) Health Services and Outcomes Research department:

- Number of prior hospital admissions in the past one year
- Discharge specialty

VH is a new model of care designed to support patients, who are at high risk of hospital readmission, for a few months after they are discharged. The programme takes the best elements of hospital care ("hospital") and applies them to patients in their own homes ("virtual"). VH is essentially providing care to patients in their own homes.

The key aims of VH are:

- Providing multidisciplinary case management;
- Serving as a communication hub for all those involved in the care for these complex patients;
- Empowering patients and offering holistic care that caters to the individual's needs;
- Acting on evidence-based forecasts from predictive risk modelling, in order to reduce acute hospital usage.

Figure 1 Dr Tan Kok Leong holding a case discussion with a VH HM

The team comprised HMs, with a consultant family physician (FP) as programme director for clinical oversight and programme development, a ward clerk, operations staff, and pharmacist support for reconciliation of medications.

Implementing VH

The ward clerk reviewed a daily electronic patient list, and eligible patients were assigned to an HM. The HMs and FPs then made home visits to their enrolled patients post discharge, to provide a baseline assessment of their ability to cope in the home environment. Using this baseline, the team drew up a more precise care plan, which the HMs then implemented. The HMs, working with individual patients, bore responsibility for case management, medication reconciliation and adjustment, appointment reconciliation and titration, investigations and monitoring, lifestyle moderation, and other health-related behaviours required. These could be done personally, or by marshalling community or hospital resources. Meanwhile, the FPs acted as advisors.

Patients were then introduced to befrienders who had undergone a standardised training course to provide layperson support.

Once patients achieved stability and confidence, they were transitioned to a community-based case manager (CCM), who continued to manage their progress. In cases of deterioration or if escalation was required, CCMs would work with HMs to tap upon acute resources. This programme has saved patients many unnecessary trips to the emergency department (ED) and prevented unnecessary hospital admissions.

From August 2012 to March 2014, the VH pilot scheme resulted in an impressive 37.5% decrease in ED attendances and a 40.1% decrease in hospital admissions (comparing each patient for 180 days prior to and after recruitment). By allowing HMs to direct the use of resources, there were real-time efficiencies in resource allocation.

"We found out that the patients who had a trusted primary care provider, and good social support from family or community, were more willing to have their care transitioned from the VH programme to the Community Care team."

– Dr Tan Kok Leong, senior consultant (Family Medicine) and Programme Director of VH, TTSH

For example, the reduction of ED attendances was accompanied by more judicious usage of hospital resources. Patients who did require such care were directed there. HMs provided patients' information to the ED staff before they arrived at the hospital, which facilitated faster triage, targeted care and smoother work flow. Upon completion of the medical intervention, ED staff could rely on HMs to keep a watchful eye on patients when they were discharged home, which provided peace of mind for both patients and the ED team.

Embarking on the next step

Although the VH team was heartened by the initiative's successes, they also understood that it could not address some things on its own. Patients often refused to transition on from VH, fearing that they would stop receiving this form of care that they found beneficial.

The team studied the Alaska Southcentral Foundation Nuka System of Care, which focuses on achieving physical, mental, emotional, and spiritual wellness, and working together as a community. Having an integrated team through binding hospital, primary, and social care partners in the community is the next step in the team's natural evolution (see new and old models of VH in Figure 2).

The pilot VH programme expanded into the FA programme from April this year (under NHG), which reaches out to primary care partners in the region (ie, polyclinics, family medicine clinics, individual GP clinics, and group practices) and strengthens partnerships with community care providers (eg, Hua Mei Centre for Successful Ageing and Ang Mo Kio - Thye Hwa Kwan Hospital).

Such co-management programmes which cross care boundaries were new to many. By placing patients' needs at the core, with much time and dialogue, each party then understood their roles and value in patients' road to recovery. It is an ongoing journey and trusted relationships (a main factor for success) take time to nurture.

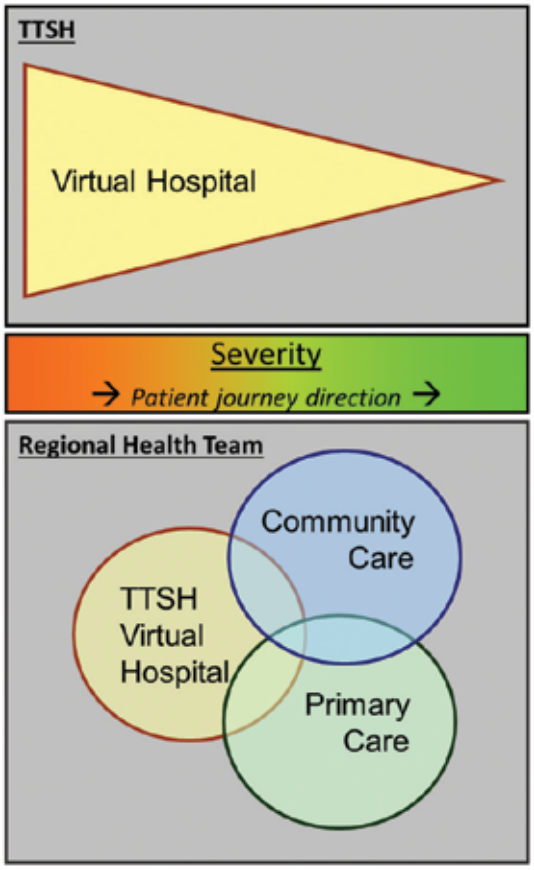

Figure 2 Old and new models of VH

Changing paradigms

The conundrum for more effective care with contained cost requires innovation:

- Change is inevitable – healthcare challenges evolve, and we must move with the times to stay ahead of the curve. There is no other alternative.
- Innovation in systems and service delivery models require a new skillset – leaders need to think like entrepreneurs, not only focusing on clinical care quality, but also viability and continuity.
- Effective networks, partnerships and relationships are cornerstones for care integration and progress towards a patient-centric model of care – we know that it is not possible to just rely solely on one single part of the care continuum to solve patients' problems. Instead, we need to leverage each other's complementary strengths as a force multiplier.

The word *innovation* originates from the Latin *innovatus*, which means "to renew or change". As modern healthcare professionals, we need to constantly think how we can do things better. That in itself makes us all necessary innovators, whether we like it or not. ■

"The success of such a programme cannot be measured purely in quantitative terms, but will need to be assessed both quantitatively and qualitatively."

– A/Prof John Abisheganaden, senior consultant and Head of the Respiratory and Critical Care Medicine Department, Programme Advisor of VH, TTSH

Dr Clive Tan is a public health specialist in the public sector, with an interest in health systems and evolving models of care. He believes that hospitals will play an increasingly important role in developing care for their surrounding communities.

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