



**BUILDING A HOME FOR PATIENT SAFETY:
NHG'S BLUEPRINT**



**“Better is possible. It does not take genius.
It takes diligence. It takes moral clarity. It takes ingenuity.
And above all, it takes a willingness to try.”**

Atul Gawande

This is the story of how we started building safer environments for patient care – and continue to do so today. It is our blueprint.

This publication is produced by Group Quality Resource Management (GQRM), National Healthcare Group (NHG), Singapore

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To create a true culture of safety and reliability we need to engage everyone, and it can only be driven when we have strong alignment. Everyone can play a role in safety.”

GARY YATES

MESSAGE FROM THE BOARD



Madam Kay Kuok
Chairman
National Healthcare Group

Every patient expects safe and quality care. Healthcare organisations have an obligation to provide the best care, treatment and services possible. This mission motivates NHG to continuously improve services and processes, and to share and learn from others. It is a philosophy that has helped us to foster a culture of safe and high quality care.

The landmark study by the Institute of Medicine published in 1999, which estimated that up to 100,000 lives were lost to healthcare error, was a rallying call for NHG leaders to focus on high quality compassionate care, and to eliminate preventable harm.

Fast forward 20 years and leaders in NHG are still holding on to this purpose and priority, reinforcing their commitment by strengthening ties with care partners to achieve continuity of care for our population.

This book documents NHG's vision of patient safety and details how its leaders carried it out at every level. By engaging every staff with our strategic narrative, NHG has spread learning and innovation, and embedded quality improvement in our daily practice, ensuring that everyone works together across professional boundaries to deliver safe care in today's complex healthcare system.

As a steward of quality and safety, NHG will continue to play a pivotal role in driving improvement and effective execution and establishing constancy of purpose.

I hope our story will inspire you to walk this path with NHG's leaders and staff. We need many hands on deck, ready to serve the greater needs and demands of healthcare, so that we can achieve better and safer care for our population.

FOREWORD



Professor Philip Choo
Group Chief Executive Officer
National Healthcare Group

Healthcare workers go to work each day intending to give their best and to deliver quality, compassionate care that is free from error. In NHG, to nurture staff commitment, leaders clarify direction and foster a positive work climate. They encourage belief in innovation and co-production with our patients and population, to contribute to our vision of a healthy population that is free from harm.

We believe leadership is crucial in shaping the culture of safety and high quality care in healthcare. We constantly ask ourselves what we have learnt in our daily practice that we can share, experiment and effectively implement in NHG. We are fortunate to have met many thought leaders in patient safety who were encouraging and generous with their sharing. We always feel energised learning from them.

The following pages recount our journey in patient safety and leadership development. It notes decisions we made, as well as the outcomes and lessons we learnt. The editorial team interviewed more than 20 people – including foreign experts and one of our patients – to canvass views and recollections of NHG's patient safety journey.

We also trawled through books, newspaper articles and external publications to paint a fuller, richer picture of our journey. We hope that by sharing this, others are encouraged to pursue ideas to bring healthcare quality and patient care to higher level.

At this juncture, it is good to take some time to reflect, consolidate gains, review our safety goals and strategies, and renew our commitment to build a culture that meets the healthcare needs of the population we serve.

I would like to take this opportunity to thank everyone involved in patient safety work for their great contributions to this movement, to make Singapore's healthcare system safer for our population.

Keep it going!

01

SURVEYING THE GROUND



SURVEYING THE GROUND

Patient safety and quality before the 2000s

TO ERR IS HUMAN

When the Institute of Medicine (IOM) in the United States released “To Err Is Human: Building a Safer Healthcare System” in 1999, it landed like a punch to the gut.

The landmark report – based on large-scale studies in Colorado, Utah and New York – charged that the American health care system, which intends to heal, too often does just the opposite, causing unintended harm and unnecessary deaths.

Among the startling revelations was that as many as 98,000 people die each year in US hospitals due to medical injuries, while around two million patients suffer hospital-acquired infections each year.

It concluded that “health care is not as safe as it should be” and that up to half of the mistakes could have been prevented.

The report caused a storm in the US – and it did not take long for the ripples to reach Singapore.

In The Straits Times’ Forum pages, there was a flurry of exchanges between the public, doctors and health officials about the implications of this report.

“People were asking, if this was happening in the US – which is seen as a benchmark for good healthcare – what about Singapore?” said TTSH Emeritus Consultant Professor Chee Yam Cheng, who was the hospital’s CMB at the time. “The public wanted to know what was being done to mitigate this.”

The Ministry of Health (MOH) assured the public that a “multi-pronged system is in place

to ensure that all medical errors, whether due to side effects of treatment, mishaps or negligence, are investigated thoroughly”.

“Hospitals are also expected to report regularly to the Ministry of Health their reviews of all hospital deaths, surgical operations and any untoward events that occur to their patients,” said MOH in a letter to the forum in December 1999.

The following year, MOH mandated all acute care hospitals to participate in the Maryland Quality Indicator Project. Before this, there had been a lack of standardisation among hospitals on the measurement of clinical indicators. Data could not be compared as a result.

The project required hospitals to monitor a set of quality indicators including inpatient mortality and unscheduled readmission within 15 days. These indicators could then be benchmarked against national and international norms, allowing hospitals to carry out more focused and targeted quality improvement actions.

A WAKE-UP CALL

Among healthcare workers, “To Err Is Human” was a wake-up call, about the urgent need to make care delivery safer.

In fact, many on the ground could already see that their mission to improve healthcare had the unintended consequence of increasing healthcare’s complexity, as they found themselves dealing with constantly evolving processes, technology and sub-specialisations. Increasingly, patients could be prescribed multiple drugs, go through more scans and tests, and be cared for by a team of healthcare workers, rather than just one doctor.

But while complex systems are more prone to medical errors, nobody talked about harm or adverse events, for fear of punishment and legal reprisal.

“If you asked Singapore healthcare workers before 2000 what the adverse event rate was, they would tell you it is zero,” Prof Chee said. “The result was that people did not talk about errors, including near-misses or errors that caused harm but not death. So no one could ever learn from these mistakes.”

And what exactly was “patient safety”? Most only had a vague concept.

“It is hard to believe these days with the widespread prevalence of patient safety work but 20 years ago when you mentioned ‘patient safety’, you would get a blank stare from many. Frankly before I had formal training in patient safety in the mid-2000s I had no idea what it meant either. There was a lack of general awareness,” said Dr Hwang Chi Hong, who headed NHGP’s quality management office in 2006.

“It’s very different from now, when ‘patient safety’ is widely understood and is a strategic intention in our healthcare organisations, from which many initiatives are being driven and implemented on the ground.”

Shortly after “To Err Is Human”, the IOM followed up with another report “Crossing the Quality Chasm: A New Health System for the 21st century”. It recommended areas for improvement and made the point that healthcare providers should look out for systemic issues instead of pointing the finger at individuals when medical errors occur.

In the report, the IOM listed six urgently needed “Aims for Improvement” of healthcare:

- Safety;
- Effectiveness;
- Patient-centredness;
- Timeliness;
- Efficiency; and
- Equity

NHG would later adopt this as their six domains of quality:

- Safe care: Protect patients from harm, injury or any preventable adverse outcome
- Effective care: Provide services based on scientific knowledge to those who would benefit from them without under- and over-use
- Patient-centred care: Provide care that is respectful of; and responsive to individual patient preferences, needs, and values, and ensure that patients’ values guide all clinical decisions
- Access to care: Reduce waits and unnecessary delays for patients
- Efficient care: Avoid waste, including waste of equipment, supplies, ideas and energy
- Culture: Promote an open, just and safe culture where staff are willing to report errors, near-misses and risks

For Prof Chee, safe care was paramount. He said: “Patient safety is the foundation of healthcare, on which we build quality. We cannot talk about quality improvement or risk management if you cannot even keep the patient safe.”

It is hard to believe these days with the widespread prevalence of patient safety work but 20 years ago when you mentioned ‘patient safety’, you would get a blank stare from many. Frankly before I had formal training in patient safety in the mid-2000s I had no idea what it meant either. There was a lack of general awareness.”

DR HWANG CHI HONG

REFLECTIONS



Professor Chee Yam Cheng

Emeritus Consultant, TTSH

Before NHG embarked on its patient safety journey 20 years ago, healthcare workers knew that things do go wrong and that patients were sometimes harmed by errors. We knew it was happening because we could see that healthcare systems were becoming very complex.

Ironically, the complexity was because patients were getting better care. They were not seen by one doctor, given a drug and sitting around for the drug to take effect.

Patients were prescribed multiple drugs and cared for by different groups of healthcare workers, each handing over a patient's care to another. Specialties resulted in each healthcare worker taking care of a smaller and smaller part of the patient's care, until it was difficult to see the big picture, or issues at a systems level.

This complexity gave rise to potential dangers. Even those not directly handling the care – the cleaner, cook, maintenance staff – could make mistakes that harm patients.

But nobody wanted to speak up or admit to these problems, because they were scared. If you asked Singapore healthcare workers before 2000 what the adverse event rate was, they would tell you it is zero. The result was that people did not talk about errors, including near-misses or errors that caused harm but not death. So no one could ever learn from these mistakes.

Two publications from the Institute of Medicine (IOM) in the US marked a turning point. The first was "To Err Is Human", which revealed that patients in the US were being harmed during their care in hospitals and that the healthcare workers are only human.

The second was "Crossing the Quality Chasm" which made the point that we should look out for issues in our system and not to persecute or prosecute the staff. The report said that

healthcare was complex and potentially dangerous, with high interdependency between different elements. Even something simple such as getting someone's age and weight wrong could cause harm because a wrong dosage of medicine may be given. The system has to be designed in a safer way, so as to protect our patients.

These publications caused a stir in Singapore. The public asked: If this was happening in the US, which is seen as a benchmark for good healthcare, what was going on in Singapore? The public wanted to know what was being done to mitigate this.

Following healthcare clustering in 2000, NHG's board and senior management made a decision to put in place measures to ensure quality and patient safety. MOH did not mandate this, but NHG felt it was important as a cluster to do so.

One key reason behind this decision was the need for us to be able to be benchmarked against healthcare standards in other countries. We want to speak the same lingo and use the same definitions or terminology.

We got the approval of the NHG board to appoint our first Chief Quality Officer Nellie Yeo, who would go and learn from the Institute of Healthcare Improvement (IHI) in the US. The board approved funding for our quality and patient safety efforts. IHI asked us to be part of the 100,000 Lives Campaign, which we agreed to. We would set targets and report indicators to our Board quarterly.

After SARS, when Singapore and TTSH did relatively well compared to other countries, MOH worked quality and patient safety elements into our Service Level Agreement and funded our work in those areas.

Patient safety is the foundation of healthcare, on which we build quality. We cannot talk about quality improvement or risk management if we cannot keep the patient safe.

02

DRAWING UP THE PLANS



DRAWING UP THE PLANS

Setting the goals and benchmark for patient safety

THE FORAY INTO PATIENT SAFETY

In 2000, the Government re-organised public healthcare into two clusters – National Healthcare Group and Singapore Health Services (SingHealth).

This was done to achieve two objectives. One was to facilitate referrals between the different institutions and to coordinate care for patients, while the other was to encourage competition so that better care could be provided.

With the clustering coinciding with the national discussion on patient safety, NHG's board and senior management decided to put in place measures to ensure quality and patient safety, said TTSH Emeritus Consultant Professor Chee Yam Cheng.

They appointed NHG's first Group Chief Quality Officer Nellie Yeo. A nurse by training, Mrs Yeo quickly recognised that there was a lack of expertise in Singapore.

"When you're tasked with serving half the population of Singapore, you need to ensure a strong foundation," she said. "We had it for quality service and quality circles, but we could do more for clinical governance."

One person she wanted to meet was Dr Donald Berwick, the Institute for Healthcare Improvement's (IHI) founding President and CEO, a leading voice for patient safety and quality.

She sent him a letter of invite signed by then-NHG CEO Tan Tee How but did not get a reply. So she decided she would go look for him at the IHI-BMJ conference in Bologna in 2001.

The trip did not get off to a good start – her luggage did not arrive. But Dr Berwick did, and when she went up to greet him the next day, he asked: "Are you Nellie?"

That was the start of a relationship between NHG, IHI and the British Medical Journal (BMJ), which was an important step for patient safety and quality improvement for Singapore.

LEARNING AND NETWORKING

IHI-BMJ was incidentally looking for an Asian country to host the 2nd Asia-Pacific Forum on Quality in Healthcare and posed the question at a gathering of Asian participants in Bologna.

"Singapore is willing to host," Mrs Yeo volunteered, and the stage was set.

Co-organised by MOH, NHG, SingHealth and the Singapore Medical Association, in conjunction with the BMJ and IHI, the forum was held in September 2002 at Raffles City Convention Centre and allowed NHG to "learn, network and really leapfrog in our understanding", said Mrs Yeo. "From then on, it really became a movement."

It was the first time that a forum of this scale was being held in Singapore and it brought together leading experts and authorities such as Dr Berwick and then Health Minister Lim Hng Kiang. The event was significant because it provided a platform for quality and patient safety to be discussed at a national level.

**2ND ASIA PACIFIC FORUM ON QUALITY IMPROVEMENT IN HEALTHCARE
11 – 13 (WED – FRI) SEPTEMBER 2002
RAFFLES CITY CONVENTION CENTRE, SINGAPORE**

THEMES

THEME 1: IMPROVING PATIENT SAFETY

- Creating a culture of safety
- Ensuring safe environments
- Learning from mistakes – anonymised reporting
- Ensuring safety of the workforce
- Whistle blowing

THEME 2: LEADERSHIP FOR IMPROVEMENT

- Leading from the front – the roles of management in quality
- Quality in a market environment
- Transforming organizations
- Building effective teams
- Promoting collaboration among professionals

THEME 3: MEASURING QUALITY AND BENCHMARKING FOR CHANGE

- Public reporting of data
- Audit and quality
- When to measure & when not to measure
- Tools for measurement of quality

THEME 4: EDUCATION AND TRAINING FOR IMPROVEMENT

- Quality improvement through education and training
- Generating enthusiasm among healthcare professionals

- Essential components of training for quality

- Learning from and with patients

THEME 5: IMPROVING HEALTH SYSTEMS

- Third party accreditation as a quality tool
- Involving patients/consumers in every part of health care
- Quality improvement in family medicine

THEME 6: IMPROVING THE CARE OF PATIENTS WITH CHRONIC DISEASE

- Redesigning systems for caring for those with chronic disease
- Self management by patients
- Evidence based care of those with chronic illness
- Shared care of those with chronic illness
- Disease management

THEME 7: THE EVIDENCE FOR QUALITY IMPROVEMENT

- Clinical improvement and evidence based health care
- The scientific basis for quality improvement
- Evidence based medicine, guidelines, and technology assessment as components of high quality care

MOH stressed ahead of the forum the importance of equipping healthcare professionals with the necessary skills and quality tools and that the event “takes a significantly different approach from the usual scientific conference as it focuses very much on teaching and stimulating discussion”.

In his speech at the forum, Mr Lim said: “Continual clinical quality improvement and the enhancement of patient safety is not just the concern of the Ministry of Health – it must be a key concern of every medical institution, doctor, healthcare professional and hospital administrator.”

Mrs Yeo would continue to attend IHI and BMJ conferences, sharing her knowledge in quality and patient safety with her colleagues when she returned. Members of the Board and senior management subsequently also travelled for these conferences.

One of the things that always struck Dr Berwick about NHG’s early patient safety journey was its spirit of curiosity and learning. He recalled that the Singaporean delegations were always open-minded when they had attended the conferences during the early 2000s.

“In a lot of countries, there’s always the ‘not-invented-here’ syndrome meaning if it hasn’t been done here, how can we learn from it? Singapore is the opposite,” said Dr Berwick. “That means your channels are wide open for learning and that learning process is essential to progress.”

- *The programme for the 2nd Asia-Pacific Forum on Quality Improvement in Healthcare, which was held at Raffles City Convention Centre in 2002*

BASELINE FOR PATIENT SAFETY

At the IHI-BMJ Forum in Bologna, Mrs Yeo had met another important overseas expert that would shape NHG's quality and patient safety journey – Dr Ross Wilson.

Dr Wilson had published an analysis of adverse events from the Quality in Australian Health Care Study (QAHCS) in 1995. She had already heard of adverse event studies at healthcare forums, which used a methodology mirrored after Harvard Medical Practice. This allowed the studies to be replicated in different countries, so results can be compared.

“I was interested because these reports talked about harm rate,” said Mrs Yeo. “At NHG, I wondered, do we know where we are? I wanted to know.”

Until 2002, there had been no established baseline on the prevalence of adverse events in Singapore. Measuring the baseline and tracking indicators, however, were important because only then would healthcare providers be able examine the current state and understand how improvements can be made for the benefit of patients.

That year, NHG embarked on its first Adverse Events Study (AES) and became the first healthcare cluster in Singapore to do so. The study was conducted through a retrospective review of medical records, adopting the QAHCS methodology that reviews hospital records for one or more of 18 explicit criteria indicating the possibility of an injury caused by healthcare.

An adverse event is an unintended injury to a patient or a complication that results from an unexpected and unintentional occurrence in healthcare delivery. They can result in hospitalisation, prolonged hospital stay or morbidity at discharge or death.

The AES established the prevalence of harm to patients caused by healthcare management, rather than the disease process.

It also led to changes in how NHG approached patient safety by switching to a systems approach instead of the traditional approach, which equated unsafe acts with staff incompetence. The traditional approach singled out individuals, without recognising the complexity of patient care.

A milestone for NHG, the AES set into motion many patient safety initiatives that would come about later. Dr Berwick said that during the early years, doctors were sceptical that improvement was necessary partly because not a lot of data on safety and quality hazards was available.

“When people don't have the information, it's hard for them to realise that they have a problem,” said Dr Berwick. “For most places including Singapore, there has been a period where physicians in roles of authority have said, ‘Well, I'm not sure we have a problem here. It has happened elsewhere but not here’”.

Alexandra Hospital, National University Hospital and Tan Tock Seng Hospital participated in the first AES. A total of 1,500 randomly selected medical records were reviewed and the study identified the need for improvement in the areas of medication safety and nosocomial infection.

After the study was completed in 2003, MOH purchased NHG's data and asked if it could replicate the study for SingHealth and private hospitals, Mrs Yeo recalled. NHG quality care reviewers, who were all personally trained by Dr Wilson, would form the original audit team.

“That was how we came up with the national AE rate,” said Mrs Yeo.

NHG would go on to conduct three more AES for the cluster, with results showing a 50 per cent improvement in the AE rate from the first to the third study.

ZERO PREVENTABLE HARM

NHG GCEO Philip Choo clearly remembers the first time he was presented TTSH's AE rates in 2003. He had been appointed as the new Chairman Medical Board of TTSH for only a month, and the hospital had just emerged from a bruising battle against SARS.

“We felt we had done fairly well in the SARS episode, but then the AE numbers brought us down to earth – the report showed that our rates were not low,” he said. “I had to translate that to how many AEs we saw a week and how many preventable deaths there were.”

After going through a period of disbelief, wondering “how is this possible” and “the figures must be wrong”, Prof Choo eventually asked to see TTSH's new ACMB Dr Tai Hwei Yee. He told her they should aim to halve the AE rate in five years, by tackling areas that would achieve the highest returns.

The AES helped to set the stage for NHG's early patient safety goals. NHG decided to embrace the vision of zero preventable harm with the aim of achieving a 50 per cent reduction in preventable adverse events every three years.

In the past, when two patients come in for the same procedure and one suffers an adverse event in our care, the fact that the two of them may have gone through two different processes would not have been considered.”

PROF CHUA HONG CHOON

It would work on the following high priority areas throughout all clinical units:

- Medication errors
- Hospital-acquired infections
- Procedural errors, e.g. wrong site surgery
- Teamwork & communications
- Functional issues

Subsequently, the Clinical Review Programme (CRP) was established in 2004 to conduct a more timely review of preventable adverse events in between the AES. It aimed to facilitate an ongoing process of detection, analysis and resolution of preventable adverse events in NHG institutions (NUH, AH, TTSH and IMH). The CRP identified preventable adverse events or breaches in standards of care through the review of medical records and triggers.

Conducting CRPs was important as it identified recurrent system deficiencies so that measures may be taken to prevent similar errors. Some of these issues highlighted include lack of documentation and communication between healthcare workers, as well as skills and competency. Once these issues were identified, the Clinical Review Committee would then propose recommendations. For instance, junior staff training was implemented to tackle skills and competency issues.

RAISING THE BAR

In the spirit of learning and improvement, NHG applied learnings from international campaigns and launched a series of ‘mini collaboratives’ within the cluster. In 2005, NHG participated in IHI’s 100,000 Lives Campaign, which aimed to encourage hospitals and healthcare providers to embark on various initiatives to reduce harm and deaths.

The campaign introduced proven best practices to help participating hospitals extend or save as many as 100,000 lives. It encouraged hospitals and healthcare providers to reduce harm and deaths preventing adverse drug events by implementing medical reconciliation and preventing surgical site infections by delivering the correct perioperative antibiotics at the proper time.

NHG participated in the campaign by launching its own “mini-collaboratives”. It decided to focus on the following:

- Prevent central line infections
- Prevent surgical site Infections
- Prevent ventilator-associated pneumonia

Institutions were encouraged to submit data and come up with measures to address these problems. To prevent ventilator-associated pneumonia, NHG rolled out a ventilator bundle for intensive care units across its institutions.

NHG Deputy GCEO Chua Hong Choon said that the 100,000 Lives campaign raised awareness about medical errors, which was still nascent among healthcare workers.

“In the past, when two patients come in for the same procedure and one suffers an adverse event in our care, the fact that the two of them may have gone through two different processes would not have been considered,” said Prof Chua, who was IMH’s first patient safety officer. “When bad things happen, it’s just bad luck.”

Later in 2006, IHI launched the Five Million Lives Campaign, which NHG also supported. Among its goals include reducing harm from high-alert medication, preventing methicillin-resistant staphylococcus aureus infection and preventing hospital acquired pressure ulcers.

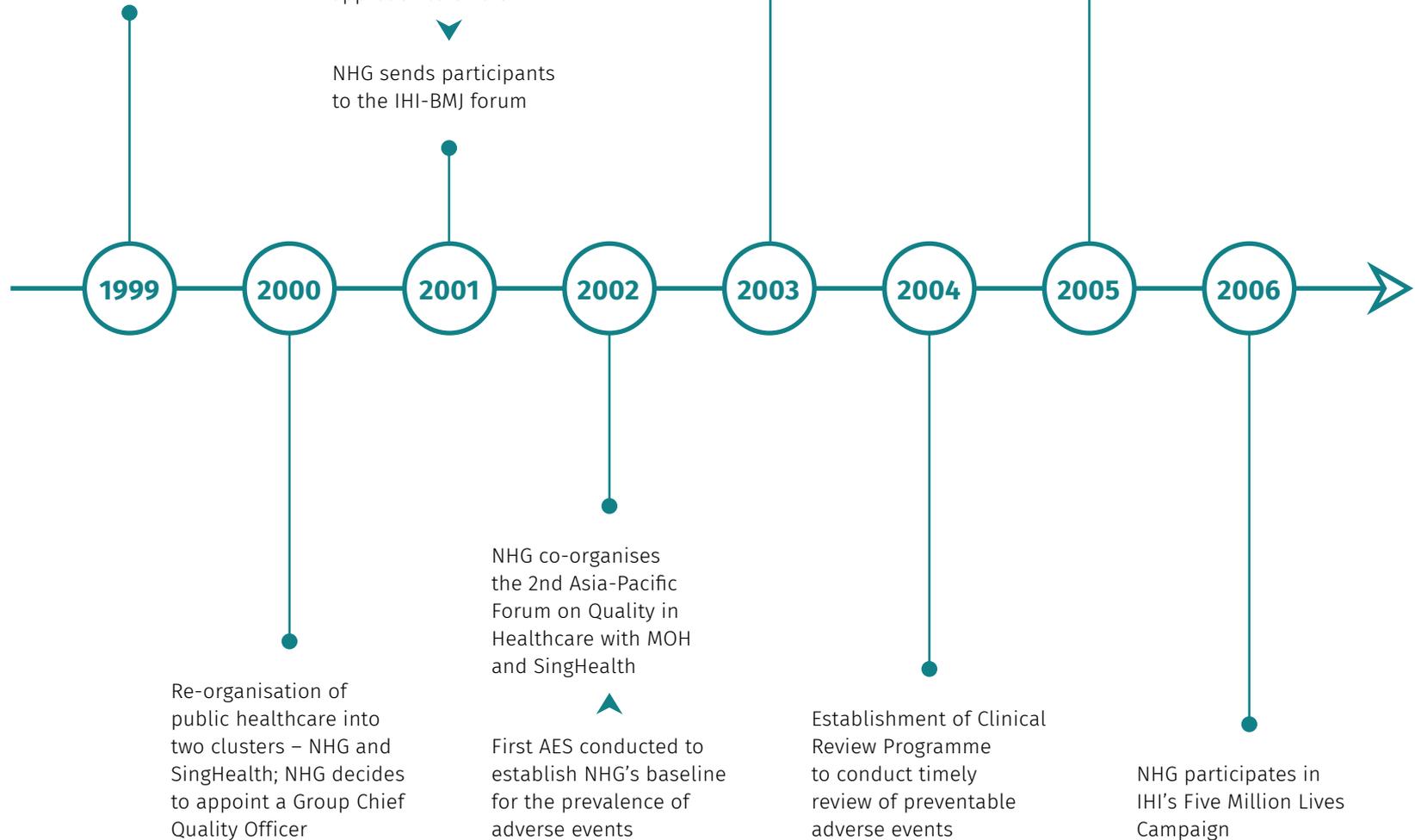
TIMELINE

Release of IOM report entitled "To Err is Human: Building a Safer Health System", which sparked off discussion on the state of clinical care in Singapore

IOM produces "Crossing the Quality Chasm" report which made recommendations on how healthcare can be improved, and for adopting a systems approach to errors

States vision of zero preventable harm with the aim of achieving a 50 per cent reduction in preventable AE for NHG every three years

NHG participates in IHI's 100,000 Lives campaign and launched a series of mini-collaboratives



REFLECTIONS



Mrs Nellie Yeo
Former GCQO, NHG

When you speak to anyone in healthcare, they will tell you that they do this job because they believe they can make a difference in someone else's life.

But errors do happen. Sometimes they can be quite serious. I've conducted family conferences and I would hate to be on the other side receiving this bad news.

So when I became NHG's Group Chief Quality Officer in 2000, I saw my main job as a change agent and facilitator. The title meant little to me because I knew this wasn't a job I could do on my own. If I could facilitate processes being revamped, or a framework or policy being accepted, that was what mattered.

To do that, I worked through groups of people – and the key group was the doctors because they are the team leaders in our system. Once the team leader is on board with me, I can move things.

For the same reason, when we launched the Clinical Practice Improvement Programme (CPIP), we mandated that all our CEOs and clinical chiefs had to attend, because it was not part of the medical curriculum previously. They will need to learn the tools and lingo of improvement, and be willing to support the ground. CPIP became a key consideration for anyone who wanted to become a clinical chief.

CPIP, like many of our other quality and patient safety initiatives, originated overseas. When you're tasked with serving half the population of Singapore, you need to ensure a strong foundation. In Singapore we didn't have the expertise yet. We had it for quality service and quality circles, but we could do more for clinical governance.

So I attended overseas conferences conducted by the Institute for Healthcare Improvement and the BMJ, where I met with, and learnt from, experts such as Dr Don Berwick, Dr Ross Wilson and Prof David Bates, among others. The great thing about these improvement networks is that people are very forthcoming and willing to help you. They are keen to share their experiences so you may benefit from them.

Of course there were challenges along the way. When we were trying to pioneer some care bundles, for instance, there were clinicians who resisted and said these were American standards and not applicable in Singapore. Now it's a given that these bundles work.

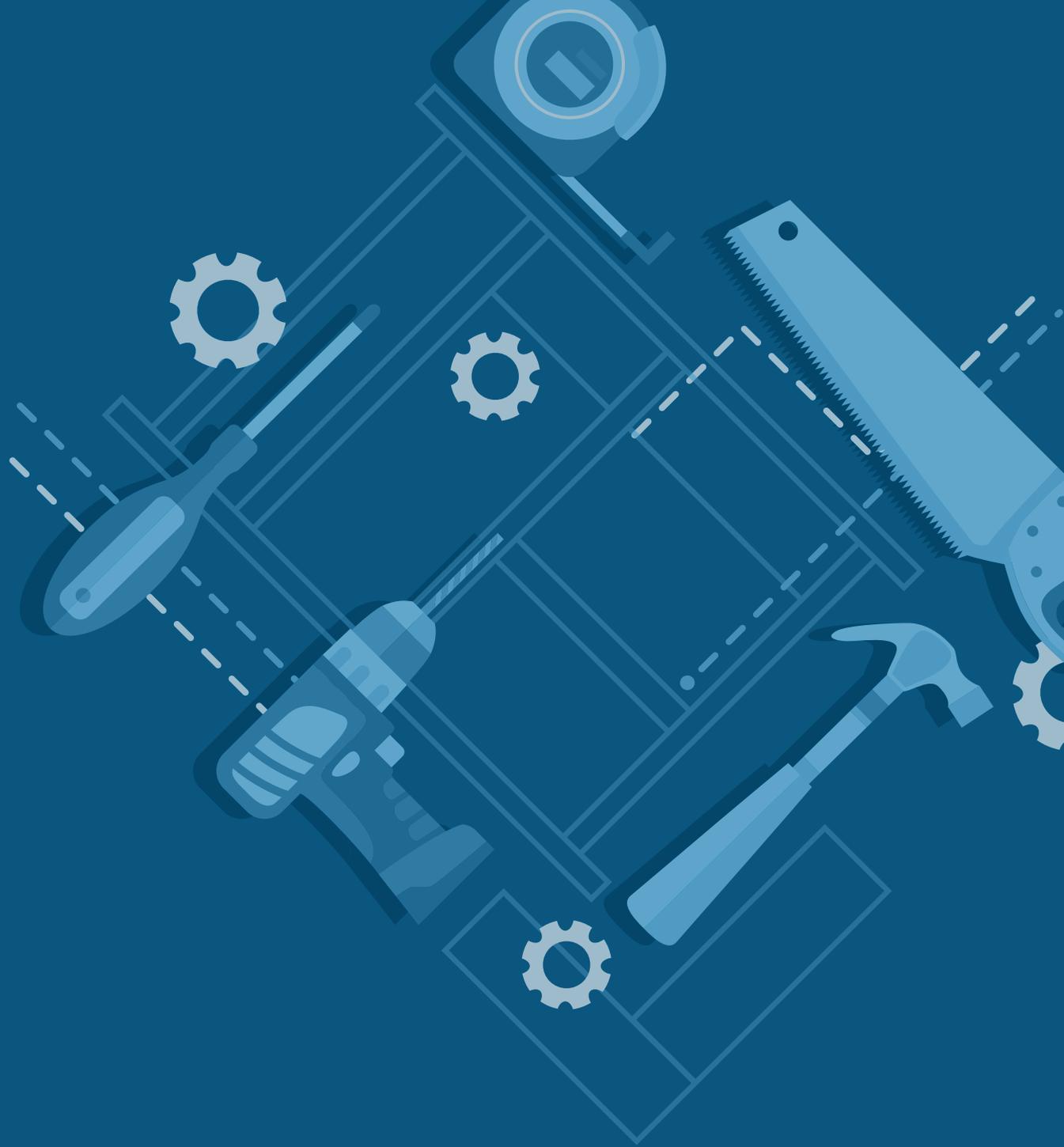
Indeed, the Rogers diffusion curve (the "diffusion of innovations" theory) says there are innovators and early adopters, but there will always be laggards – and they can place significant barriers in the way. My experience, however, is that if you stay patient, they will eventually come on board or they will leave.

While patient safety can be hard work, it will always be worth the effort. The results you get from redesigning processes and improving the system, can help deliver patient care that is safer and more effective.

I've met so many people committed to patient safety during my years in NHG – they have helped me grow and made my work so fulfilling. I couldn't have done it on my own. Those were really the best years.

03

LAYING THE FOUNDATION



LAYING THE FOUNDATION

Learning the fundamentals and putting into practice the systems approach to patient safety

QUALITY AND PATIENT SAFETY IN NHG

The IOM's report "Crossing the Quality Chasm: A New Health System for the 21st century" published in 2001 recommended a sweeping redesign of the healthcare system, noting that organisations should look out for systemic issues instead of pointing fingers at individuals when medical errors occur.

In Singapore, quality care was not a new concept, but previously it assumed that good doctors and facilities (service quality) would naturally lead to good processes and outcomes (clinical quality).

The new approach to quality would be different, following IOM recommendations. It adopts a systematic and scientific approach to its measurement and management, recognising medical errors as a systemic problem requiring systemic solutions.

Hospitals in both the public and private sectors began employing teams of full-time quality managers to measure clinical processes and outcomes, instead of simply leaving it to individual doctors to decide what works best for their patients.

NHG developed its Quality and Safety Plan in 2000 to guide its planning and execution of activities. In 2002, the completion of the first NHG Adverse Event Study (AES) provided added impetus for action.

NHG's senior management team quickly realised it needed to get large numbers of its clinicians up to speed on quality improvement and patient safety concepts, which at the time had not been taught in medical or nursing schools.

Several NHG leaders, such as its first GCQO Nellie Yeo, had learnt about a Clinical Practice Improvement training programme in New South Wales. Started by Dr Ross McL Wilson – an eminent intensive care physician and project director of the Quality in Australian Health Care study – the programme was targeted at clinicians and hospital administrators.

So in 2002, NHG sought out and engaged Dr Wilson to create a similar programme in Singapore for their clinician leaders and senior administrators. The leadership commitment to this programme was seen through the attendance of NHG board members, CEOs and medical directors at an inaugural session conducted by Dr Wilson.

"Doctors are our team leaders so we needed them to come on board first to move things. We mandated that clinical heads of departments had to attend this Clinical Practice Improvement Programme (CPIP)," said Mrs Yeo. "They needed to learn the tools and lingo of improvement, and be willing to support the ground staff."

NHG began to view unsafe practice, error and harm through the "Swiss Cheese Model", originally formulated by James Reason and Dante Orlandella, which illustrates how accidents occur due to a complex chain of contributing events. Each "slice of cheese" represents defences, barriers and safeguards.

But like Swiss cheese, each slice also has "holes" or limitations. Occasionally, the holes momentarily line up, permitting an accident to take place. Understanding the failure points and what contributed to these failures is crucial in improvement and the prevention of recurrence.

Many of NHG's early patient safety projects took a big-picture, systemic approach to problem-solving, such as standardising workflows, protocols and terminologies. These are done to reduce variation and complexity, ensuring that the right steps are taken every time.

NHG QUALITY AND SAFETY FRAMEWORK

To guide its quality planning, decision-making and organisational activities, NHG developed its Quality and Safety Framework. First implemented in 2000, it helped to shape NHG's patient safety priorities during the early years and details key required elements of:

1) Detection

This involves detecting harm, error or sub-optimal quality before or after an incident occurs. The Incident Reporting Information System, for instance, is a non-punitive voluntary reporting channel for staff to report clinical and non-clinical incidents and near misses for the purpose of risk management and learning.

2) Analysis

Tools such as Failure Modes and Effects Analysis (FMEA) and Root Cause Analysis (RCA) enable healthcare staff to analyse how errors occur, and how they can be prevented. When Serious Reportable Events (SREs) take place, an RCA focused on systems and processes must be conducted to find out why it occurred. Findings and recommendations are then submitted to the Ministry of Health for improvement and learning at the national level.



► NHG's first CPIP run was held at the Jurong Bird Park and conducted by Dr Ross Wilson

3) Improvement

NHG has implemented programmes to enable staff at all levels to participate in improvement. Skills and knowledge of improvement methodology are imparted to clinical improvement teams through improvement facilitators and faculty.

4) Monitoring and change management

To ensure quality and patient safety, it is important to monitor key indicators at the institution and group levels. This is done through the Quality Dashboard, which includes group-level indicators for safe care.

5) Developing a safety culture

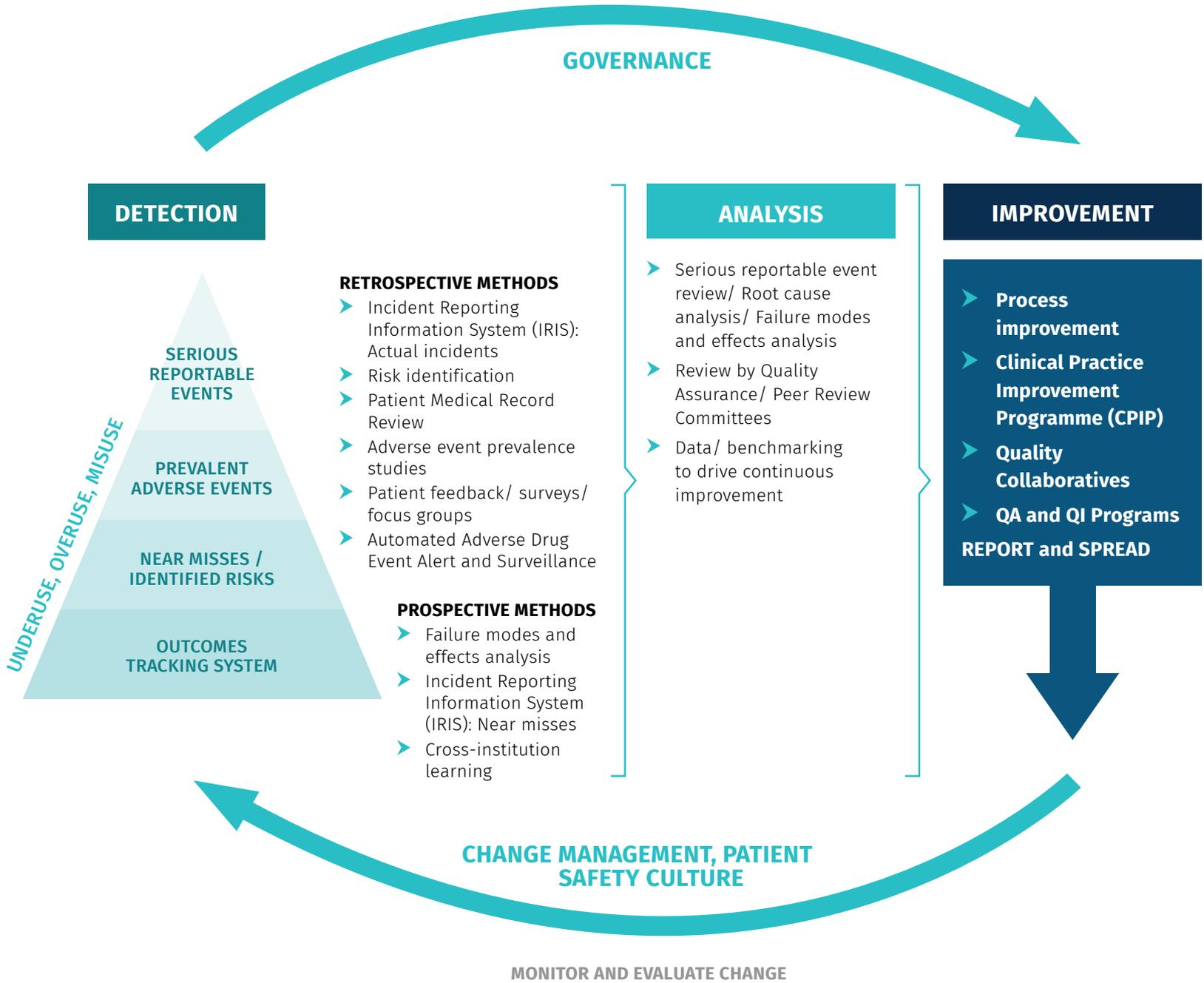
A safety culture is essential in protecting our patients and staff from unnecessary risk or inadvertent harm. Every staff is therefore encouraged to take personal responsibility for safety, communicate safety concerns, and strive to actively learn from mistakes.

6) Developing a service culture

Service delivery and communication are key in providing holistic care to patients.

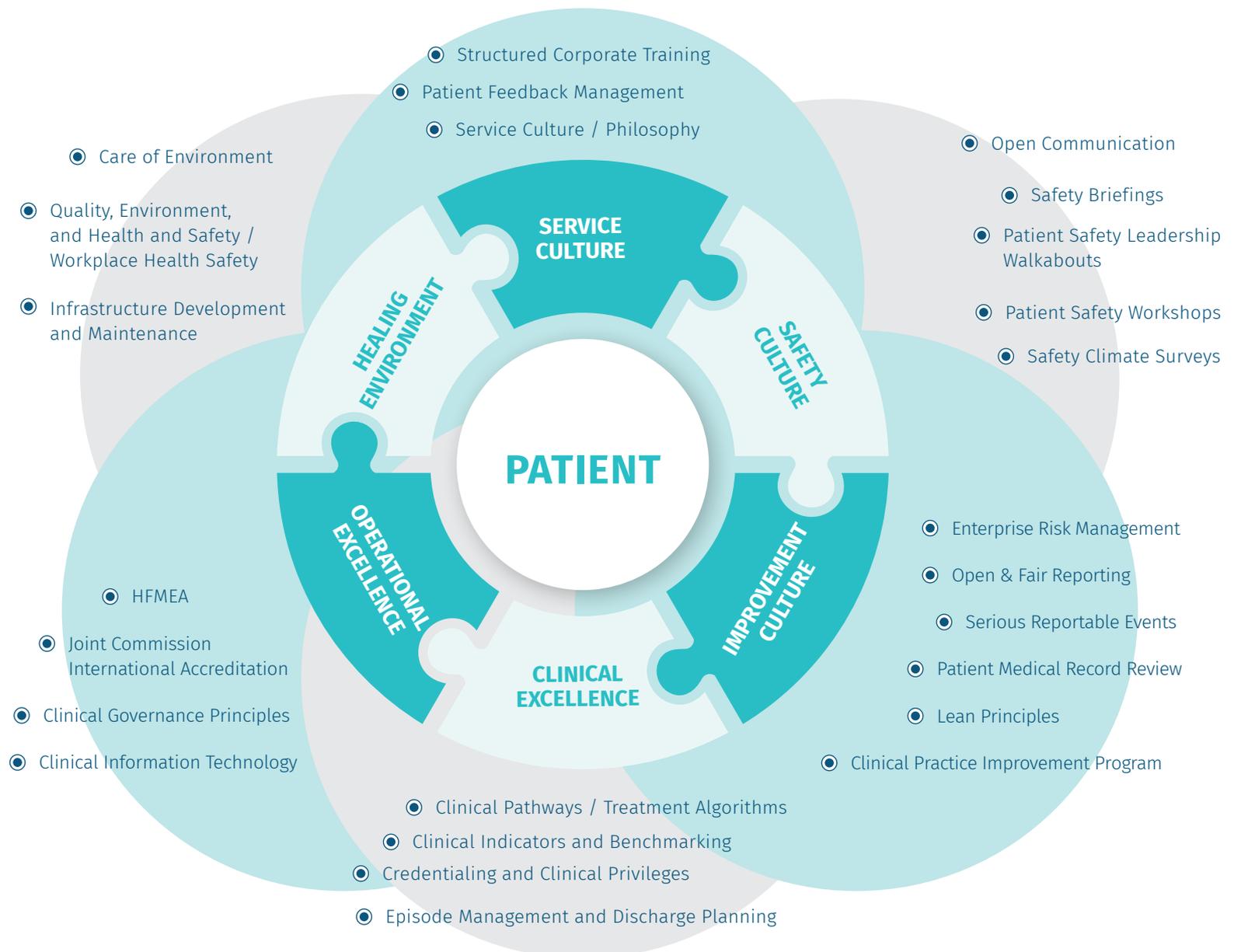
7) Achieving operational and clinical excellence

To maintain readiness and uphold standards and best practices, NHG conducts internal audits and cross-institutional mock audits to identify and close gaps.



NHG's policy also outlines its integrated Quality and Safety Plan which involves both clinical and non-clinical activities. It covers the following areas:

- Improvement culture
- Safety culture
- Service culture
- Operational excellence
- Clinical excellence
- Healing environment



IMPACTFUL IMPROVEMENT

The AES and other monitoring mechanisms indicated a need to address a few key healthcare systems and processes. To tackle medication safety and other areas for improvement, NHG embarked on several quality collaboratives in the 2000s.

Modelled after IHI's collaborative model for achieving breakthrough improvement (IHI's Breakthrough Series), quality collaboratives involve groups of healthcare staff across different disciplines collaborating and making system-level changes.

They bring together multiple sites with the common aim of adapting and spreading existing knowledge in areas requiring improvement, and rapidly scaling the impact of improvements.

Dr Kok Mun Foong, director of NHG's first quality collaborative in 2003, said collaboratives are a way to scale evidenced-based interventions across NHG with teams from institutions sharing and learning from each other.

"When we did the medication safety collaborative, NHG already had various quality improvement initiatives in place, such as the CPIP which had been running for some time," said Dr Kok. "The improvements were impactful but limited in scale."

Medication safety

NHG's first AES in 2002 revealed that drug-related injury was one of the main contributors to the overall AE rate, accounting for 19 per cent of all AEs. Drug-related injury was also associated with 2 per cent of hospitalisation episodes.

"Medication safety was an easy choice for the first collaborative, as the need was compelling and it was easy to get the buy-in of healthcare providers at the frontline," said Dr Kok.

In November 2003, the NHG medication safety collaborative was officially launched with the aim of reducing adverse drug events (ADEs) by 60 per cent in their three acute hospitals – Alexandra Hospital (AH), National University Hospital (NUH) and Tan Tock Seng Hospital (TTSH). Dr Kok and Dr William Chan were appointed as the collaborative's director and improvement advisor respectively.

The collaborative's change package – a collection of evidence-based practices – helped to effectively improve the safety of medication management. It emphasised high-impact, low-cost initiatives, which were developed after extensive literature review and consensus from subject matter experts and Professor David Bates, who was engaged as the expert advisor to the collaborative.

A well-known medication safety expert, Prof Bates was the director of Centre of Excellence for Patient Safety Research and Practice, and Chief of the Division of General Medicine, Brigham and Women's Hospital, Harvard University.

He gave the group a "long list" of changes to consider, which aimed to create a culture of safety, redesign processes, establish measurement systems and facilitate active collaboration and information sharing.

When he returned a year later, he recalled being pleasantly surprised.

"Nearly everything on the list had been tried at one of the entities within NHG, and many changes had been made across the organisation," Prof Bates wrote.

Part of the improvement involved standardisation, which aids patient safety by reducing variation, complexity and confusion, making it more likely that healthcare staff will perform the correct step each time. Protocols were standardised for high risk drugs like warfarin, while prescribing terminology was standardised with a list of Do-Not-Use abbreviations created (see next page).



STANDARD PRESCRIBING ABBREVIATIONS DO NOT WRITE THESE ABBREVIATIONS

Do Not Write	Spell Out	Reason
u or U	unit	It may be mistaken as Zero
iu or IU	unit	It may be mistaken as IV (intravenous) or 10 (ten)
µg or UG	mcg	It may be mistaken for mg (milligram)
QD QOD, qod	daily every other day	It may be mistaken for 4 times daily
DC	discontinue	It may be mistaken for discharge
.5 mg	0.5mg with a leading Zero	It may be mistaken for 5mg (10X overdose)
10.0 mg	10mg, without trailing Zero	It may be mistaken for 100mg (10X overdose)
Abbreviated Drug Names Examples:	Soluble insulin SI Carbamazepine OR Carbimazole CMZ Prednisolone OR Propranolol PNL Hydrochlorothiazide OR HCT Hydrocortisone	To prevent misinterpretation

Approved Prescribing Abbreviations

Abbreviation	Interpretation
Once ...	
Once /4 mth	Once in 4 months
Once /2 mth	Once in 2 months
Once /mth	Once every month
Once / 5 week	Once in 5 weeks
Once /2 week	Once in 2 weeks
... a week	
5X /week	5 times a week
Once/week	Once a week
... a day	
5X /day	5 times a day
QDS/QID	4 times a day
TDS/TID	3 times a day
BD/BID	2 times a day
ON	Every night
OM	Every morning
Daily	Every day
... hourly	
4H	4 hourly
Hourly	Hourly
...every other day	
EOM	Every other morning
EON	Every other night

Abbreviation	Interpretation
STAT	Immediately
... PRN	
PRN	When necessary
OM PRN	Every morning when necessary
ON PRN	Every night when necessary
BD/BID PRN	Max 2 times a day when necessary
TDS/TID PRN	Max 3 times a day when necessary
QDS /QID PRN	Max 4 times a day when necessary
Every evening PRN	Every evening when necessary
Daily PRN	Daily when necessary
Every 3 days PRN	Every 3 days when necessary
3H PRN	Every 3 hourly when necessary
Hourly PRN	Every hour when necessary
... every morning	
OM (Mon, Tue, Wed, Thurs, Fri, Sat, Sun)	Every morning on Mon, Tues, Wed, Thurs, Fri, Sat, Sun
OM (Mon to Sat)	Every morning from Mon to Sat
At bedtime	At bedtime

“There’s an awful lot of concern in healthcare about the autonomy of physicians and others, to do what they want and less commitment to everyone agreeing to do things the same way,” said IHI founding CEO Donald Berwick. “Proper standardisation is part of the safety agenda.”

NHG senior management also took a major investment decision to enhance and error-proof prescribing processes through the introduction of the Computerised Physician Order Entry (CPOE) and Clinical Decision Support System (CDSS), which prevents errors related to drug prescriptions, interactions and contraindication.

The medication safety collaborative produced several successful pilots. Routine medication reconciliation in AH and TTSH were shown to prevent medication errors by as high as 48 per cent, while having a dedicated Intensive Care Unit (ICU) pharmacist in NUH reduced potential ADEs by 72 per cent.

Dr Kok said that to tie in with NHG’s vision of zero preventable harm, the collaborative also stressed the importance of creating a culture of safety, to create a climate that placed “paramount importance” on improving patient safety and reducing preventable harm in NHG institutions.

Explaining why the collaborative succeeded, she said: “There was strong NHG leadership support, clinical champions were fully engaged, the pharmacy leads and their teams highly motivated, and David Bates was more than generous in his sharing. All the stars were aligned.”

There was strong NHG leadership support, clinical champions were fully engaged, the pharmacy leads and their teams highly motivated... All the stars were aligned."

DR KOK MUN FOONG

YEAR	2005	2006	2007	2008	2009	2010
Prescription errors (%)	0.45	0.36	0.19	0.27	0.21	0.18
Dispensing misses (%)	0.42	0.34	0.25	0.19	0.15	0.14

While the Collaborative steering committee involved the three large acute hospitals, many of the changes in policy, culture building, IT system changes and so on were rolled out to all NHG institutions, including IMH, NHGP and NSC.

NHGP, for instance, introduced electronic prescribing, or e-prescription, to improve medication safety in 2006.

After its implementation, there was a marked reduction in the number of errors and near-misses (see table above).

The new system helped to remove issues with illegible handwriting, and drugs prescribed during the previous clinic visit could be selected and duplicated quickly. It also reduced the potential for errors as clinicians need not manually paste the patient's name stickers on the prescription.

In subsequent years, NHGP developed the Critical Medication Information Store (CMIS) to facilitate automatic electronic reporting of adverse drug reactions.

Besides CPOE and CDSS, other technology-driven solutions to improve processes and reduce errors were implemented progressively in NHG institutions over the next few years, such as automated medication dispensing and closed-loop medication management.

Communicating critical laboratory results

Critical Laboratory Results (CLR) are laboratory findings where delays in reporting may have serious adverse consequences on patients.

But in the early days of the global patient safety movement, studies had shown that life-threatening test results were often not communicated quickly enough to attending physicians.

Since 2004, the Joint Commission International (JCI) has set timely reporting of CLRs as one of its patient safety goals. At NHG's institutions, the average time taken to notify doctors following the availability of results ranged widely, suggesting there was too much process variation and inefficient workflows.

So NHG embarked on the CLR collaborative, which lasted from 2006 to 2009. This was its second cluster-wide collaborative and involved AH, IMH, NHGP, NUH and TTSH. It adopted a change package from the Massachusetts Coalition for the Prevention of Medical Errors, which had been implemented at 40 hospitals in the US state and was the most extensive critical laboratory communication effort at the time.

Gathering its own clinicians and laboratory medicine experts, NHG aimed to have all critical results communicated to and acknowledged by the healthcare provider within time targets, and that all critical results were acted upon in an appropriate manner.

The collaborative ensured firstly, that there was a common definition of "critical" values. Critical laboratory values were also harmonised across NHG institutions. A standardised workflow was put in place so that there could be uniform and timely communication of the critical lab results within institutions.

A monitoring system was also established, with case notes reviewed by independent auditors to monitor the effectiveness of and compliance to the workflows, and to determine the percentage of CLRs communicated on time.

Over two years, the collaborative accomplished the following:

- Inpatient CLRs communicated to healthcare providers within one hour improved from 93 to 98 per cent; median turnaround time was shortened from 17 to 11 minutes
- Outpatient CLRs communicated within two hours increased from 78 to 98 per cent; median turnaround time was reduced from 55 to 12 minutes
- Inpatient CLRs with documented actions increased from 59 to 96 per cent; outpatient CLRs, from 79 to 97 per cent

Describing the risk of delayed CLR communication as a “long standing issue”, the collaborative’s chairman Dr Wong Moh Sim praised the efforts of the teams involved.

“Getting people together from different institutions with different established processes and different cultures is never easy,” she said. “Everyone demonstrated exceptional dedication towards better patient care.”

Reducing Methicillin-resistant *Staphylococcus Aureus*

Methicillin-resistant *Staphylococcus Aureus* (MRSA) is a bacterium that causes infections in different parts of the body. It is spread via skin contact and can survive for extensive periods of time on surfaces and objects.

To reduce the spread of MRSA within hospitals, NHG started a MRSA collaborative from 2007 to 2009. It introduced the following:

- Active targeted surveillance and isolation or cohorting of MRSA carriers and cases
- Infection control education and reinforcement for staff, including hand hygiene and contact precautions
- Creating a database for MRSA incidents and generating reports to ensure information is provided to all levels of staff, including for bed management
- Regular internal and external audits on hand washing and infection control practices compliance using a standardised audit tool

High-alert medications collaborative

The NHG HAM (High-Alert Medications) Collaborative began as a multi-cluster collaborative in 2009 with the objective of redesigning and making changes to existing systems and processes in medication management.

Consisting of six participating public healthcare institutions – IMH, KTPH, NHGP, NSC, NUH and TTSH – the aim was to achieve a 30 per cent reduction in ADE associated with HAM. Following the five-year improvement journey, the collaborative achieved a 73.3 per cent reduction in total ADE rate and 70.6 per cent reduction in preventable ADE rate.

In addition to the reduction rates, the collaborative also developed a localised HAM list and HAM change packages for each medication category to improve the safe use of these medications.

The localised HAM list helped institutions to prioritise HAM drugs and drug classes so they could focus on areas with the greatest medication safety concerns. The list was submitted to the MOH National Medication

Safety Taskforce, which adopted it to establish the Standardised HAM Reference List in the National Medication Safety Guidelines Manual.

EQUIPPING CLINICIANS WITH TOOLS

Clinical Practice Improvement Programme (CPIP)

One of the most important developments in NHG’s quality improvement journey was involving clinicians in driving the improvement of quality care and patient service. Identifying gaps and problems in the system was only one part of the equation. Healthcare staff have to be equipped with the right skills and knowledge to improve care systematically.

In the early 2000s, there was a shift in the United States, Europe and Australia from quality assurance to applying continuous quality improvement theory to redesign clinical care processes.

The journey for CPIP at NHG began in 2001 when senior clinicians Associate Professor Thomas Chee and Dr Kok Mun Foong were asked to attend the 4th New South Wales CPIP in Sydney.

“Dr Wilson had offered us those two free CPIP slots when I first met him at an IHI-BMJ forum in Bologna,” then GCQO Nellie Yeo recalled, referring to leading patient safety and quality expert Dr Ross Wilson. “I accepted immediately.”

The five-day residential workshop was unlike the typical training or course familiar to most clinicians. Instead of having only lectures or discussions, participants were expected to use quality improvement tools to complete a clinical project within the next six months.

CPIP officially kicked off a year later, after NHG senior leaders and some Board members were introduced to it through a half-day workshop with Dr Wilson who “did a great job with the clinicians”, said Mrs Yeo. It was important that NHG’s leaders were involved in CPIP and engaged from the onset, so they could drive and lead clinical improvement efforts.

In 2006, Dr Tai Hwei Yee, then Assistant Chairman, Medical Board (Clinical Quality and Audit), TTSH, submitted a poster entitled “CPI programme – a Journey of Excellence” to the Hospital Management Asia Conference.

In her submission write-up, she said that a strong mandate from leadership is very important in order for CPIP to succeed in any healthcare setting.

“Management or leadership participation is crucial to get buy-in from the rest of the healthcare workers,” she wrote. “Support, encouragement and guidance should be given to clinicians who are involved in doing the projects”.

The poster would go on to win the “Most Outstanding” Award for the “Patient Safety/Quality Medical Care” category at the conference.

During CPIP, participants are taught to adopt a systems approach to quality improvement. This involves understanding patient’s needs, diagnosing gaps, measuring variance, using PDSA cycles, collaborating with multi-disciplinary care providers and designing strategies to sustain change. Participants attend a 3.5 day workshop and are then given six months to complete a CPIP project.

During the early years, there were large numbers of training to help equip staff with the knowledge and tools to carry out quality improvement work. CPIP was expanded to other public healthcare clusters and private hospitals from 2004 to 2005. In 2006, more than 30 per cent of senior doctors had been trained in the programme and NHG had formed the CPIP panel, teaching faculty and institution faculty.

Since 2001, more than 1,800 NHG and non-NHG staff have embarked on more than 1,300 improvement projects. Some of these projects have gone on to become sustainable, hospital-wide, and cluster-wide, and even national protocols.

Patient safety workshops

As part of equipping clinicians with the tools for improvement, NHG’s institutions conducted patient safety workshops for their staff, starting from 2005.

NHG’s group of Patient Safety Officers (PSO) came together to design a common patient safety core curriculum that could be adopted by all NHG institutions. This was important as junior doctors rotate between different hospitals for their postings, so a common patient safety knowledge base would put everyone on a level playing field and standardise understanding of the topic.

The workshops introduced NHG’s staff to basic patient safety concepts. Between October 2005 and January 2009, more than 30 workshops were held, which trained 1,155 healthcare providers, including doctors, nurses, allied health professionals and administrators.

The issues covered are important for patient safety, such as teamwork and communication. In 2006, for instance, TTSH got its doctors and nurses together to train for an integrated

resuscitation drill, although resuscitation training was traditionally intra-professional. The workshop highlighted how teamwork and communication between doctors and nurses could improve patient safety.

By 2010, TTSH’s patient safety workshops evolved to a three-hour foundation workshop, which was compulsory for the hospital’s new junior doctors and nurses.

“We moved towards case scenarios for learning and teaching, which many participants have told us was more useful,” said Dr Tan Kok Leong, who became a PSO in 2009 and today heads TTSH’s Continuing and Community Care department.

“We also realised the importance of having the right mix of doctors and nurses join the workshop, because of the importance of communication between the two family groups.”

Over time TTSH also began revamping the syllabus for different professional groups, so that case studies are more relevant to each group’s settings. For example, Allied Health Services & Pharmacy started conducting workshops for their own family group.

MEASURING PATIENT SATISFACTION

First conducted in 2004, the MOH patient satisfaction survey assessed the level of satisfaction within restructured hospitals, national specialty centres and polyclinics, providing healthcare providers with a first-hand view of how their services can be improved.



► NHG's institutions have been conducting patient safety workshops for their staff since 2005. The picture above shows a workshop at IMH

Respondents are asked to rate their perceptions in various aspects such as facilities and clear explanation by staff on procedures and care. It found that outcome satisfaction and care satisfaction were consistently more important to patients than service satisfaction, and that patients' experiences with doctors and nurses were the strongest predictors of care satisfaction.

These surveys provided useful comparative data for benchmarking, organisation development and strategic planning for NHG and other healthcare institutions, adding to their total quality management.

In recent surveys, NHG has performed on par with, or better than the national average in key measures. The patient satisfaction survey later evolved into the patient experience survey in 2017.

DOING MORE WITH LESS

According to IHI, a perfect process is one that creates precisely the right value for the customer. The central idea behind Lean is determining the value of a process by distinguishing the value-added steps and eliminating waste, so that every step adds value to the process.

In terms of safety, it aims to improve the reliability of processes through identifying and eliminating operational barriers, and reduces variability through standardisation. MyCare aspires towards zero preventable adverse events.

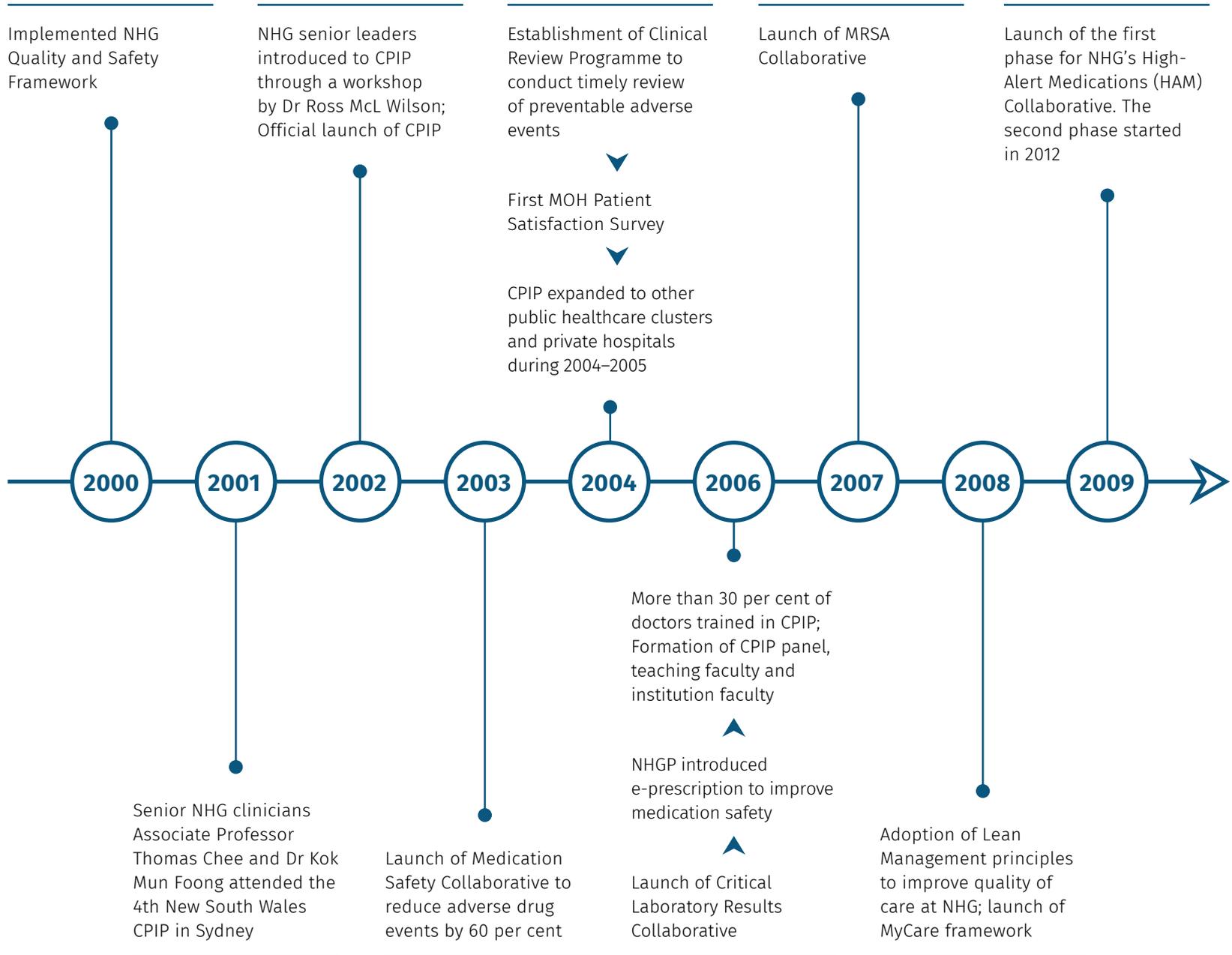
Since 2008, NHG has adopted the five Lean Management principles to improve its quality of care. Lean forms the backbone of NHG's MyCare Framework, which adopts the principles "Faster, Better, Cheaper, Safer" to guide its staff in eliminating waste, redesigning care processes and delivering value.

"We called it MyCare because we wanted to make it personal, like how I would want 'my care' to be," said NHG GCEO Philip Choo. "We improve by trying to make everything slightly faster, slightly better, slightly cheaper and slightly safer."

"People always think the better the quality, the more expensive the cost. Actually the truth is exactly the opposite. The better the quality, the lower the cost, because we are cutting down waste and there is no need to waste money on repeated work."

"That is the principle behind MyCare... Each cycle we improve a little bit and we tie it to personal accountability."

TIMELINE



REFLECTIONS



Dr Donald Berwick

President Emeritus and Senior Fellow,
Institute for Healthcare Improvement

NHG is an organisation that takes patient safety very seriously. I've visited NHG facilities in Singapore and I can see projects organised around hospitals that reduce complications, infection rates and pressure ulcers.

Just as importantly, I see systemic approaches at the leadership level. This is key because patient safety does not gain traction without the attention of senior executives. When I visited their hospitals in Singapore, the executives and clinical leaders were always there. There was a sense of real commitment at the very top, focused on quality and safety as strategic agendas. That signals potential for real success.

From the point of IHI, I would say NHG showed infinite curiosity. When Singapore delegates attended IHI's conferences in the early 2000s, they were always open-minded. In a lot of countries, there's always the "not-invented-here" syndrome, meaning "if it hasn't been done here, how can we learn from it"? Singapore is the opposite, with constant curiosity and open-mindedness.

NHG seems to me like a very curious organisation, in the sense that its leadership scans all the time for innovations that could be brought to Singapore. An example would be the early relationship between NHG and the leaders of Scotland's patient safety movement. Scotland had emerged as a country seriously dedicated to patient safety on a national scale and NHG's leaders were very familiar with the progress there. What sets the safety and quality movement in Singapore and NHG apart, is the willingness to learn and import lessons from elsewhere.

Singapore also hosted one of the early national patient safety efforts, by hosting

the 2nd Asia-Pacific Forum on Quality in Healthcare in 2002. I remember being there and the energy level was phenomenal. The number of people who came together from the Asia-Pacific region was a real boost to the patient safety movement and NHG would have been pivotal to the event's success.

Moving forward, I think Singapore, like all countries, has to work against fragmentation of effort despite its relatively small population. There are several different agencies and authorities dealing with patient safety and quality, and while I'm always a fan of inter-agency cooperation – which I believe is underway in Singapore – sometimes I felt there are many different balls in the air.

When you have different organisations, such as MOH and professional groups, all working on patient safety and quality of care separately, they may not coordinate their efforts as well as when they are working together. The endeavour to harmonise such efforts is important and I encourage Singapore to keep working on that.

Maintain your bold aims. Keep quality and patient safety on the front burner for leaders so that every meeting, agenda and investment has safety and quality at its heart.

Invite the workforce to use its imagination and knowledge together. This is not accomplished by directives, but through involvement and invitation. Stay focused on social justice and particularly vulnerable populations – in your case, frail elders, as well as the immigrant and poor populations, as these people are especially at risk of safety hazards. And don't forget about cooperation – the single most important resource in achieving quality is cooperation.

04

BUILDING THE PILLARS



BUILDING THE PILLARS

Inculcating a safety culture in NHG

As soon as it embarked on its patient safety and quality mission, NHG began cultivating its safety culture in earnest.

While it is a “soft” component of patient safety, Institute for Healthcare Improvement (IHI) founding CEO Donald Berwick once pointed out that “culture will trump rules, standards and control strategies every time.”

In NHG’s annual report 2002/3, Chairman Michael Lim wrote: “We want to ingrain the culture of continual clinical improvement through identifying and empowering clinical champions to lead in projects that significantly impact the quality and delivery of care and patient safety.”

When the idea of having a patient safety culture was first mooted, however, there was a significant level of cynicism among our staff.

“Many thought that NHG already had such a culture, or that as long as sub-optimal processes were fixed, our care would be safe,” said NHG Group Chief Quality Officer (GCQO) Tai Hwei Yee.

In healthcare, a safety culture is one where staff have a collective mindfulness about safety issues. A constant concern about safety and awareness of the potential for things to go wrong is woven into the organisational fabric.

Institutions with a generative safety culture often demonstrate teamwork, communication, continuous improvement and pro-active actions to prevent harm. Meanwhile, their leadership and management support help to create psychological safety, which allows people to feel comfortable reporting and discussing errors.

Research shows that this has real impact on delivering quality care, as a strong safety culture has been found to have a positive effect on safety processes and patient outcomes.

“When it came to patient safety, as it is with many things in life, there are early adopters and there are laggards. We could not force people to do patient safety work – what we could do is give talks, give them books to read and encourage them,” said TTSH Emeritus Consultant Professor Chee Yam Cheng.

“Almost everyone who came on board started as a volunteer. For those who have done good work, we would highlight their good work and write a note of thanks to them.”

FROM THE TOP

One aspect that NHG quickly recognised was that patient safety culture begins right at the top, and that leaders had to practice what they preached.

Studies of the effective use of total quality management have found that senior and middle management plays a substantial role in conveying the culture to frontline workers.

“To foster a safety culture, NHG’s staff must feel empowered and safe to make changes.” noted NHG GCEO Philip Choo.

“People don’t look at what leaders say – they look at what leaders do,” he said.

We want to ingrain the culture of continual clinical improvement through identifying and empowering clinical champions to lead in projects that significantly impact the quality and delivery of care and patient safety.”

MR MICHAEL LIM

One such test came during his first week as TTSH CEO, when a group of staff did a presentation on the care process of MRSA patients. They found that doing MRSA testing at the Emergency Department and isolating them appropriately with the information (“admitting them clean”) could save about 30 lives and 300 potential adverse events.

But the cost of the process was about \$2 million – and there was no funding for this.

“They asked: Do we do this? Then they looked at me. I laughed. To me, this was the easiest decision,” he said, proceeding to tell them that the hospital just needs to do a few big quality projects, and use the money saved for this initiative.

He added that when NHG launched MyCare, about 90 per cent of TTSH staff were taught simple Lean tools and problem solving, but only 20 per cent of them were applying the solutions.

“We realised it was taking place only in places where leaders acknowledge the staff and the changes, and do it in a planned and strategic fashion,” he said.

Prof Choo’s point was that staff take their cues from the top and may not voice dissenting opinions, so leaders need to be mindful of their actions. “The ground just watches. They watch every decision we make.”

WALKING THE GROUND

One of the ways that NHG involves leadership in demonstrating commitment to safety is through patient safety leadership walk rounds, where leaders make rounds to meet staff to discuss safety issues.

The leaders may comprise the Chief Executive Officer, Chairman Medical Board, Director of Nursing, Chief Operating Officer and Quality Director, among others.

These walk rounds are conducted to help leaders learn about safety issues on the ground, find out what staff are worried about, and hear any suggestions they may have.

The rounds are kept informal, so that staff can speak up more freely, and leaders often ask what they themselves can do to help. Surveys done after the walkabouts found that staff appreciated the opportunity to surface their problems and suggestions directly to the executive leadership.

“We do these walk rounds to show that our leaders value the views of the staff and will support them,” said Prof Chee.

Walk rounds are sometimes held in conjunction with safety briefings, which are based on concepts in aviation and other industry and aims to increase safety awareness among frontline staff and incorporate safety consciousness into daily routines. Getting frontline staff who were willing to share and lead case report discussions often proved effective in engaging other staff in discussion.

From 2004 to 2008, NHG conducted more than 100 leadership walk rounds and closed more than 80 per cent of safety issues raised. The practice continues regularly today at NHG’s institutions.



► Patient safety walk rounds - such as this one conducted at IMH (above) - allow leadership to directly discuss safety issues with ground staff

SAFETY CHAMPIONS

To help drive safety initiatives, NHG appointed Patient Safety Officers (PSOs) in institutions as proponents, change agents and resources for patient safety on the ground.

PSOs are empowered to act and remove change barriers. They investigate safety issues, make regular presentations to the organisation's governing body on safety issues, and have the resources and organisational support to implement safety initiatives and improvement work.

But the first PSOs sometimes took on these roles without knowing what to expect.

Among the early nominees was IMH CEO Chua Hong Choon, who recalls his name

being mentioned in the initial discussions between then-NHG GCQO Nellie Yeo and IMH's leadership.

"My initial thought was, what's all this about?" Prof Chua recalled. "I was guilty of having a traditional mindset and assumed that patient safety and quality probably won't have anything to do with mental health."

But Mrs Yeo met him to explain and got him to think more deeply about patient safety. He realised after their chat that improving outcomes, reducing variation and error, and standardising care were matters that applied across all healthcare institutions.

"My experience as PSO helped me to apply all the developments in healthcare quality to mental health," he said. "I found it fascinating."

Besides Prof Chua, NHG's pioneering PSOs include:

- Drs Wong Moh Sim and Lydia Au (AH)
- Dr Hwang Chi Hong (NHGP)
- Dr Anthony Goon (NSC)
- Dr Sophia Ang (NUH)
- Dr Tan Hui Ling (TTSH)

NHG's PSOs were appointed by NHG's Clinical Board. They are in charge of conducting patient safety workshops as well, for staff from different NHG institutions. In its first four years, PSOs conducted 16 patient safety workshops for NHG staff, training more than 450 physicians and 230 nurses.

I've spent time counselling some of our most difficult patients, who were causing a disproportionate amount of problems in the wards, and at times even threatening violence towards staff and other patients."

ADJ. A/PROF ALEX SU

Using actual incidents as case studies, the workshops covered topics such as the patient safety framework; human factors in healthcare delivery; effective teamwork and communication; and Situation Background Assessment Recommendation (SBAR). They reiterated systems thinking and reliability in design.

Dr Alex Su – who has been IMH's PSO since 2012 – feels that a PSO needs to be a trusted friend and mentor to the ground staff and not “someone coming to find fault with them.”

One less talked about area of his job is to reduce staff stress and increase staff's joy at work, he pointed out.

“I've also spent time counselling some of our most difficult patients, who were causing a disproportionate amount of problems in the wards, and at times even threatening violence towards staff and other patients,” he said. “It's important to remember that our staff are our resources in implementing patient safety and we need to take care of them as well.”

To educate staff, the early PSOs contributed to Patient Safety Voice, a one-page, electronic newsletter that focuses on pertinent patient safety issues that affect the daily lives of the ground staff. Launched in 2006, it was emailed to all NHG staff every two months.

Besides PSOs, institutions also appoint department safety champions. These champions have the responsibility of communicating information, acting as resource persons to facilitate improvements on patient safety within their own departments and patient care areas.

“NHG's PSO network is one of our greatest strengths,” said Prof Tai. “The PSOs constantly share and learn from each other, with best practices and successful pilots in one institution often rolled out and implemented in others.”

PATIENT SAFETY CULTURE SURVEY

To understand patient safety perceptions of our healthcare professionals, a series of surveys were conducted in NHG institutions, starting from 2005. The survey tool was adapted from one used by the Agency for Healthcare Research and Quality (AHRQ).

NHG's first cluster-wide survey was conducted in 2005, with an overall response rate of 75 per cent. This was followed by surveys in 2007, 2009, 2011 and 2017. The surveys help to determine the impact of NHG's patient safety initiatives on the views of staff towards patient safety.

Over the years, NHG has improved from a “compliance culture” to a “proactive culture”, according to the Patient Safety Index developed by workplace and safety culture consultants Concordia NZ (see facing page).

THE PATIENT SAFETY INDEX (DEVELOPED BY CONCORDIA NZ)

	20%	40%	60%	80%	100%
LOW	<p>Lack of:</p> <ul style="list-style-type: none"> Culture awareness Board/ Governance awareness Leadership Communication Learning Incident reporting Management support Investigation & feedback Investment & resources <p>Behaviour:</p> <ul style="list-style-type: none"> Passive – not care Blame and control Patient safety issues ignored Denial ‘She’ll be right’ attitudes 	<p>Lack of:</p> <ul style="list-style-type: none"> Culture awareness Board/ Governance understanding Leadership <p>Activities:</p> <ul style="list-style-type: none"> Statistics collection Top-down edicts Legal compliance Talk vs Role-model Overreact to incidents Minimum training 	<p>Lack of:</p> <ul style="list-style-type: none"> Culture understanding Board/ Governance monitoring <p>Activities:</p> <ul style="list-style-type: none"> Compliance communication Audits & training Safety participation Safety meetings Data collection 	<p>Leadership:</p> <ul style="list-style-type: none"> Board agrees policy & resource activities Management & employees engaged Open communication loop 	<p>MATURE CULTURE</p> <p>Patient Safety Culture:</p> <ul style="list-style-type: none"> Presence on Board of Safety and Quality Director Patient Safety Culture Index Management/workforce shares responsibility in partnership to identify and resolve risk Patient & Staff Safety recognised as good for all organizational outcomes Strategy for contiguous improvement Genuine ability to achieve sustainable outcomes <p>Behaviour:</p> <ul style="list-style-type: none"> Proud of organisation Up to date best practice Financial sustainability & safety equally essential Innovative ideas Share knowledge with others
HIGH	<p>Management doesn't know – doesn't care</p>	<p>Management knows but doesn't always care</p>	<p>Management cares but doesn't always know</p>	<p>Management cares and knows how to improve</p>	<p>Management cares, knows, and helps improve</p>

➤ The Patient Safety index takes into account responses from all 12 dimensions in the survey, as the cluster journeys towards a “mature culture”

The Patient Safety Index takes into account responses from all 12 dimensions in the survey, as the cluster journeys towards a “mature culture”

In 2017, NHG institutions participated in a survey conducted by the Singapore Healthcare Improvement Network (SHINe) for 21 institutions in Singapore. NHG ranked above the national average in the following areas:

- Management support for patient safety
- Feedback and communication about error
- Teamwork across units

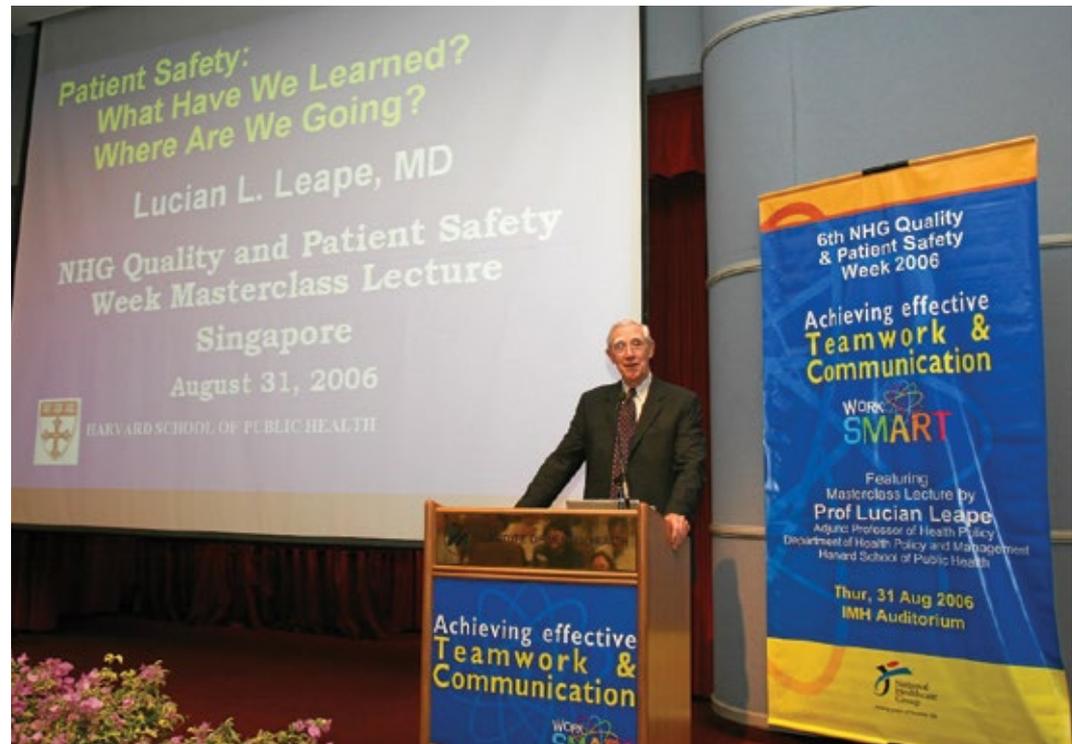
The survey also showed that there were opportunities for improvement in:

- Communication openness
- Non-punitive response to errors
- Supervisor/manager expectations and actions in promoting safety

Since 2004, NHG has instituted numerous initiatives to improve non-punitive responses to errors and teamwork and communications (for more details, please refer to Chapters 5 and 6).

More recently, in 2017, Yishun Health introduced the Speaking Up for Safety® Programme under the Safety and Reliability Improvement Partnership Framework, a collaboration between Yishun Health and Cognitive Institute in Australia.

It aims to train staff to be more at ease and motivated in speaking up for safety. Staff are also equipped to develop insights and skills to respectfully raise issues with colleagues when they are concerned about a patient’s safety.



- *Dr Lucian Leape from the Harvard School of Public Health shared addressed teamwork and communication for patient safety during NHG’s Quality and Patient Safety week in 2006*

CELEBRATING SUCCESSES

To raise awareness on patient safety and quality, NHG began running quality-related events from its inception. In 2000, the first NHG Quality Week was held with the theme “Synergy in Quality”, with guest speaker Dr Vahe Kazandjian from US-based Centre of Performance Sciences.

Other notable patient safety experts who have shared insights at Quality Week include Dr Lucian Leape (Adjunct Professor of Health Policy, Harvard School of Public Health, USA), Dr Donald Berwick (former President & CEO, IHI, USA) and Dr David Bates (Chief, Division of Internal Medicine, Brigham & Women’s Hospital, USA).

Since then, NHG’s Quality Week or Quality Day has been held every year, to recognise and celebrate successes in patient safety and quality, as well as to learn and share through presentations by experts and improvement project leaders.

Quality Day today recognises quality and service excellence in NHG, which are important measures of productivity.

The Excellence in Action Awards (EIAA) recognises individuals and teams who inspire continuous improvements in their workplace, foster a sense of community amongst colleagues, and provide care to their patients.

Meanwhile, the Quality Improvement Awards (QIA) recognise quality improvement projects that innovate to improve and transform healthcare delivery through continuous improvement efforts that aligns with NHG's sustainable healthcare model. The QIA is divided into five categories:

- Improving and sustaining quality and safety
- Service redesign and delivery
- Developing a flexible and sustainable workforce
- Building strong partnerships in improvement work
- Innovation in healthcare



➤ NHG celebrating exemplary patients and caregivers during Quality Day

Since 2008, NHG has also been honouring patients who volunteer their time and effort to support fellow patients. The Exemplary Patient and Caregiver Award (EPCA) today not only recognise volunteers, but patients and caregivers who have left a lasting impression on staff for their grace in adversity and positive attitudes.

REFLECTIONS



Professor Philip Choo
GCEO, NHG

I have a Post-It Note on my table's stationery holder with two numbers. One states TTSH's adverse event rate; the other states how many preventable deaths that translates to.

The numbers came from NHG's first Adverse Event Study (AES), when I was TTSH's Chairman Medical Board (CMB). I took them very personally.

When we first processed them, I was only in my first month as CMB. We had just emerged from our battle against SARS, where we felt we had done quite well. So the figures from the AES – which was never done here before – brought us down to earth.

I asked to see Dr Tai Hwei Yee, who had been appointed as TTSH's ACMB at the time and gave a target of halving our AE rate in five years. We would apply the 80/20 rule, tackling the top five issues that make up the majority of our adverse events – such as medication errors and hospital-acquired infections – so as to get the most effective returns.

For any initiative, we should target at least 30 per cent improvement because anything below that may not have resulted from actual process improvement, but through temporary hard work that cannot be sustained.

Although some foreign experts we consulted felt our five-year target was difficult to achieve, we pulled it off. It showed that it was possible to set big goals and achieve them.

To make changes, however, our staff must feel empowered to do so by the leadership, who have to build a conducive environment and provide psychological safety.

When we launched MyCare, we taught 90 per cent of our staff some Lean methodology and simple problem solving. Yet only 20 per cent

of our staff were applying the solutions. We realised it was taking place only in places where leaders acknowledge the staff and the changes, and do it in a planned and strategic fashion.

Leaders have to equip their people with the right set of skills and allow them to apply it in a controlled way. Do it well, spread it, and when other units adopt it, you have a new standard of care. You have to explain the importance of your policy, acknowledge good work and repeat your message many times.

Leaders also have to remember that people are watching their decisions all the time. They may not say anything, but they are watching, so it's important that the leader's words and behaviour are consistent. Trust is precious. All you have to do is breach it one time – and whatever you have built up over the years will be gone. People will remember it for a long time and keep bringing it up.

We have accomplished a lot in our patient safety journey, but there is still a lot of work ahead. While Singapore may have one of the lowest adverse event rates in the world, we should remember that Six Sigma measures in incidents per million. Only healthcare is still measuring in the hundreds, by per cent. You would not accept a car that has an accident rate of 4 per cent.

So being as good as other healthcare systems is not enough. We have to be the best even when measured against other industries. There is still too much variance in the way that healthcare is delivered, way higher than other industries. While we've made great strides, there remain many areas for improvement and for us to work together on.



05

**CONSTRUCTIVE
CONVERSATIONS**

CONSTRUCTIVE CONVERSATIONS

Tackling adverse outcomes and SREs openly

Fear is a difficult thing to overcome. NHG GCEO Philip Choo has seen it first-hand.

For while it has been almost 20 years since NHG began its patient safety journey, he still gets questions from staff about the organisation's non-punitive culture.

"I always ask them to show me one example when someone was punished for a blameless error," he said. "They cannot. Perhaps they see it in other places and get worried, but it does not happen here."

A non-punitive culture is crucial for patient safety efforts. Studies have shown that if an organisation is safety conscious and people are encouraged to speak up about mistakes, then safety is improved and preventable errors are not repeated. As such, staff must feel comfortable to report incidents and near-misses.

"Reporting is important as it helps us to collect data and observe trends, so that measures can be taken to improve patient safety," said Ms Kwek Puay Ee, who was TTSH's director of nursing from 2001 to 2011. "In the case of falls, for example, many of the initiatives that came about all started from reporting."

But in its early days, this represented a major mindset change for many healthcare workers. Most were new to the systems approach and the concept of open and fair reporting, and naturally worried about the personal and legal consequences of owning up to errors.

It was thus important for NHG to create psychological safety for staff. This would include having a clear reporting policy that describes how the organisation will manage processes and individual staff involved in incidents, complaints and claims.

It acknowledges that the causes of a patient safety incident are multiple and complex, and often due to deep underlying system issues rather than deliberate actions of an individual staff. A transparent and structured analysis needs to be done before determining the contribution of the system or the individual towards the causation of an incident.

Leadership must also promote a shift from a culture of blame of the individual. Incidents should be dealt with fairly – free from bias over outcome and hindsight – and there should be appropriate learning and action afterwards.

"We are never punitive unless the action is deliberate," Prof Choo stressed. "Trust is precious. All you have to do is breach it one time – and whatever you have built up over the years will be gone."

LEGAL CHANGES

In 1999, Singapore's Private Hospitals and Medical Clinics (PHMC) Act was amended to prevent forced legal disclosure of quality assurance matters in hospitals. As members of Quality Assurance Committees (QAC) in the hospitals reviewed the quality and appropriateness of services provided, and the practices and procedures carried out, they had to be protected from personal liability.

*Trust is precious.
All you have to do is
breach it one time –
and whatever you have
built up over the years
will be gone.”*

PROF PHILIP CHOO

The Act was amended to ensure that QAC findings cannot be used as evidence that the service or practice was inadequate or inappropriate. Neither can they be forced to disclose their findings before a court or tribunal.

This is because quality assurance programmes were based on a peer review process, which required doctors to evaluate each other's performance. Speaking in Parliament before the Act was amended, Senior Minister of State (Health) Dr Aline Wong noted that many doctors shied away from participating in such programmes as the findings could lead to legal action against the hospital.

Also, doctors were personally liable for their opinions in such programmes and could be sued for defamation by other doctors. Protection within the law was therefore important to build trust and encourage open sharing.

Then in 2002, the Ministry of Health (MOH) set up the National Sentinel Event Reporting System, which required reporting from hospitals on sentinel events – known today as serious reportable events (SREs) – and make necessary changes to prevent a recurrence.

With this new system, following an SRE, a de-identified initial report has to be sent to MOH within seven days, followed by a detailed root cause analysis (RCA) report, and then an update on whether recommendations made by the QAC have been implemented. MOH would collate and analyse the reports, before releasing the summaries and aggregated statistics back to the institutions.

Reporting a mishap does not grant immunity to those involved in the incident, MOH said in news reports. But it stressed that the focus of QACs is “not so much on who is to blame, but on finding ways to improve”.

The introduction of the new reporting system and related laws, as well as the engagement with institutions prior to the system's launch, led to an increase in the number of reports received nationally by MOH.

VOLUNTARY REPORTING

During the early 2000s, hospitals tried to encourage voluntary reporting through setting up a voluntary reporting system. It aimed to identify as many gaps in the system as possible, as it would include near-misses and less serious incidents, which are not reported to MOH.

Initially the reporting was done manually, but that surfaced problems such as illegible handwriting.

Then following a successful pilot at NUH in 2001, the online hospital occurrence reporting system, or eHOR, was launched for AH, IMH, NNI, TTSH and NHG Polyclinics.

The eHOR allowed staff to report incidents online and granted relevant personnel quick and easy access to information. More importantly, online reporting ensured better confidentiality and accessibility, and prevented issues such as reports being misplaced, which were factors that hindered staff reporting.

Reality hits

But while the launch of eHOR was meant to encourage voluntary reporting, it soon became apparent that there was a disconnect with ground staff.

In 2004, TTSH conducted its first climate survey for staff on patient safety. The survey aimed to understand the culture within the hospital and how staff felt towards the following areas:

- ▶ whether the organisation recognised and acknowledged the risks and took responsibility for patient safety
- ▶ whether staff felt that errors were treated as opportunities for improvement
- ▶ whether staff were treated in an open and fair way when errors occurred, and if reporting an incident would get someone into trouble
- ▶ whether staff understood most errors were caused by multiple systemic failures and not from an individual's actions
- ▶ whether they had been given any training on patient safety and teamwork

Findings from the survey indicated that while staff acknowledged management support for patient safety, and agreed they had received feedback and communication about errors, many had felt they were blamed for errors or mistakes.

Respondents also indicated that they were fearful and hence reluctant to report even though there were unsafe acts committed either by themselves or others. The survey revealed that senior management were perceived as being unaware of issues on the ground or more focused on productivity.

BUILDING A NON-PUNITIVE CULTURE

TTSH realised that apart from providing the platform for voluntary reporting, it was important to build a strong safety culture.

According to the Institute of Medicine, the “biggest challenge” in moving towards a safer health system is changing the culture from one of blaming individuals for errors to one in which errors are treated as opportunities to improve the system and prevent harm.

Following this survey, TTSH embarked on a variety of initiatives to close this gap. Among them was establishing a policy for open and fair reporting of incidents. This was to make it explicit to staff that the hospital recognised most patient incidents arose as a result of a combination of multiple processes in complex systems.

The non-punitive policy was established in 2005 and aimed to promote a fair and open culture. This means that hospital staff are able to openly and freely share information pertaining to incidents and near misses, and are given fair treatment when an incident happens.

The hospital developed an HR policy that emphasised a systems approach in the analysis of an incident and de-linked staff performance with error. It specifically states that incidents and near-misses reported through eHOR are used solely for the purposes of improving quality and patient safety and that no information shall be used in staff performance appraisal or be documented in the staff personal record.

Furthermore, patient safety and quality activities were kept separate from disciplinary activities. RCA findings meant for learning, for example, are not shared with the hospital's

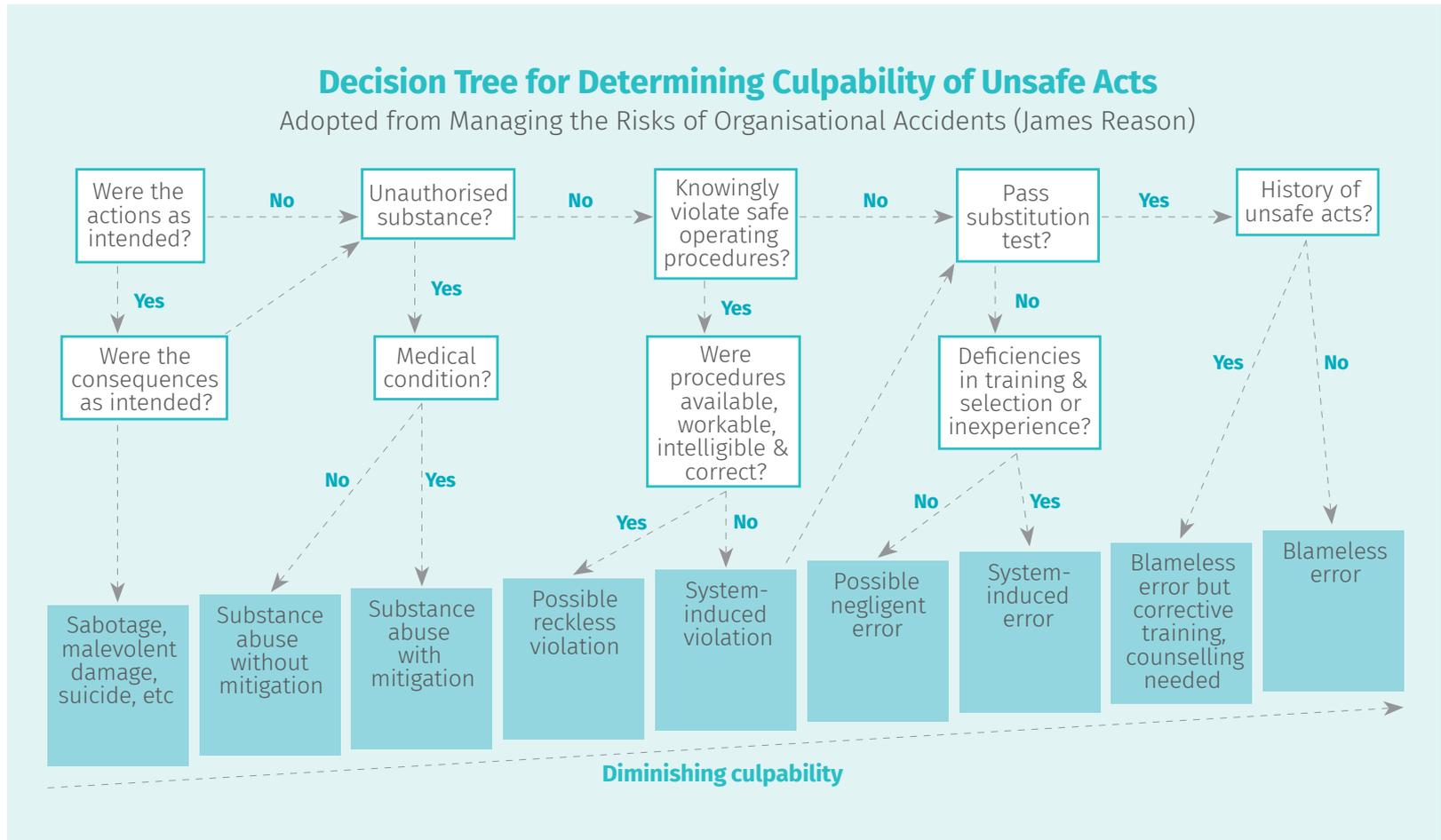
committee of inquiry (COI). Any reports to management would be aggregated and de-identified, and premature assignment of blame is avoided.

This approach acknowledges that the causes of an incident cannot simply be linked to the actions of the individual healthcare staff involved. While individuals are accountable for their actions, the system in which people work in must be looked at to understand what happened and why. To drive this home, TTSH embedded theories on human factors and complexity theory in their patient safety training.

Ms Kwek, TTSH's former director of nursing, recalled needing to first build trust during the early days. Instead of diving straight into heavy topics, she kicked off by holding feedback sessions with her nurses on more “bread-and-butter issues” – such as shift hours and off-days – to give them courage to voice their opinions.

“These sessions were not related to Just Culture or non-punitive culture, but they were important for building trust and rapport with staff,” she recalled. “Without this, it would have been very difficult to encourage them to do reporting.”

At the same time, NHG introduced the James Reason Incident Decision Tree (see diagram next page) as a tool to help department heads and unit managers think through systemic and organisational issues behind human error, and take a systematic, transparent and fair approach to decision making through a series of questions.



► The James Reason's Incident Decision Tree helps managers to determine the degree of culpability for individuals who have committed unsafe acts

For nurses, building this culture goes beyond saying that nurses won't be blamed, Ms Kwek added. "Leaders should share anecdotes of how nurses spoke up and were not punished."

Indeed, starting from 2004, to demonstrate to their staff how their reporting on eHOR helped improve patient safety, then TTSH ACMB Tai Hwei Yee would share real-life de-identified adverse events (AE) examples at the monthly hospital conference.

The main objective was to highlight the system and process changes that have taken place because of the reporting, to show that there was no need to punish the staff if the problem was with the system, and to reiterate the shift from individuals to the system.

The hospital's PSOs and Quality Review Officers (QRO) would then bring these stories back to share with their departments, to spread the message and culture.

"We shared real-life examples so people would know this was happening at TTSH," said Prof Tai. "Then by showing them the improvements that took place after, we provide a vision for what the situation should be and remind staff that they have the tools to make these changes."

IMPROVING CULTURE

NHG's efforts bore fruit over time. Since the Open and Fair Incident Reporting policy was introduced, it has seen an increase in the number of hospital-occurrence voluntary reporting (see right for aggregate results for AH, NUH and TTSH).

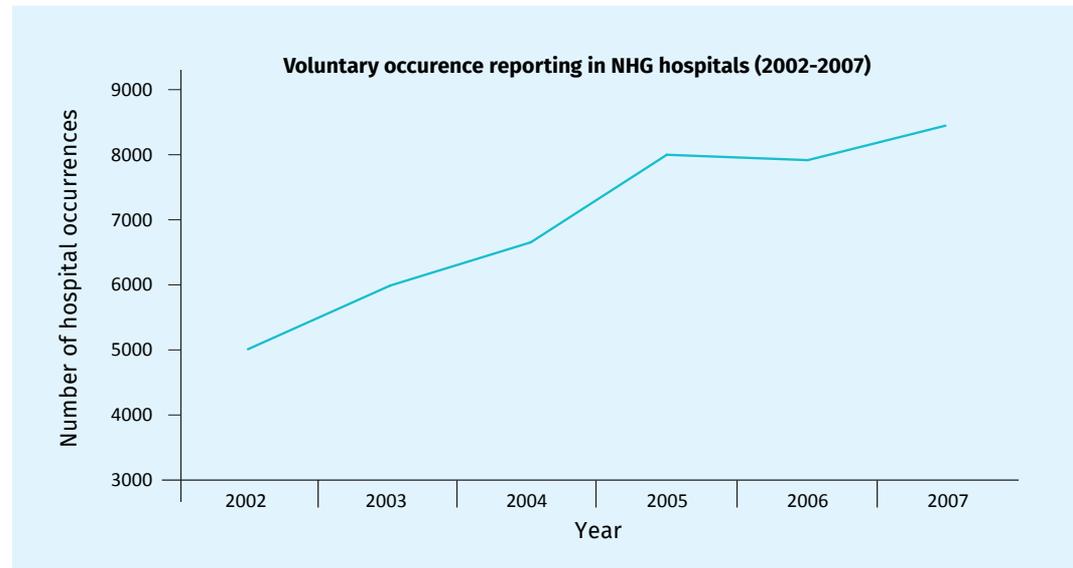
Managers were encouraged to close the loop with staff, so that they can get feedback, and be updated on improvements instituted after their incident reports were made. This helped to spread and sustain the practice of reporting.

"We now have a better safety culture," noted Dr Anthony Goon, who was NSC's first PSO. "More incident reports are generated when in the past such incidents were just swept under the carpet."

Still, it is a constant challenge to keep improving those report numbers, Ms Kwek acknowledged. While nurses have become more vocal in speaking up or reporting incidents over the years, there will still be staff who are reluctant to report voluntarily.

"I think it's natural to worry about owning up," she said. "Attributing blame to an individual may still happen, because blame is a matter of perception and that is something that can't be controlled."

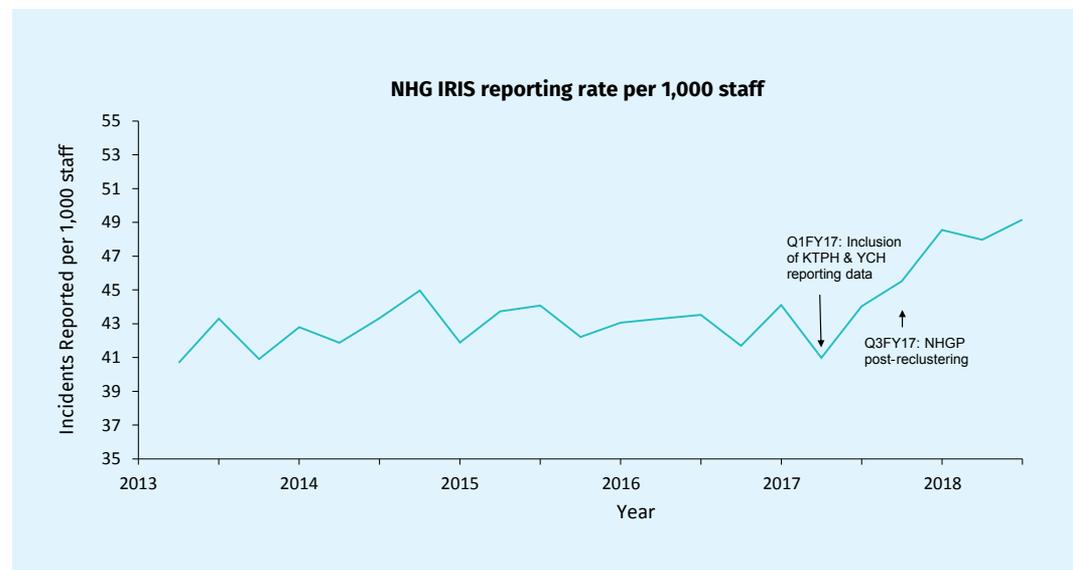
In January 2013, the Incident Reporting Information System (IRIS) was launched, replacing the eHOR system. This NHG cluster-wide system allows staff to report incidents, near misses, or unsafe conditions. These include incidents related to diagnosis and treatment, medication, patient falls and sharps injuries, among others.



➤ The number of reports made in eHOR increased after extensive efforts to promote a safety culture

The reporting templates, workflows, and system functionalities were simplified to encourage more voluntary reporting. This new system led

to an improvement in reporting culture, as more incidents were voluntarily reported since its implementation (see chart below).



We shared real-life examples so people would know this was happening at TTSH. Then by showing them the improvements that took place after, we provide a vision for what the situation should be and remind staff that they have the tools to make these changes.”

ADJ. A/PROF TAI HWEI YEE



► TTSH's IRIS café is a hands-on workshop that provides hands-on training in RCA and IRIS reporting

STRENGTHENING JUST CULTURE

There are continuous efforts on the ground to strengthen reporting and Just Culture. Soon after IRIS was introduced, for instance, TTSH launched IRIS café, a coaching platform where multi-disciplinary ground leaders go through a four-module workshop.

It was started in 2014, after ground leaders gave feedback that they lacked the knowledge and practical skills to identify system-related patient safety issues. The workshop thus trains them to perform simple RCAs at the unit level, write a comprehensive IRIS report and critique IRIS reports, among other things.

Participants have found it useful because of the hands-on approach and use of real-life cases. More than 300 staff from allied health, operations and nursing have been trained so far. Patient safety topics such as falls, medication errors and pressure injuries, have also been discussed, to identify contributing system-related issues.

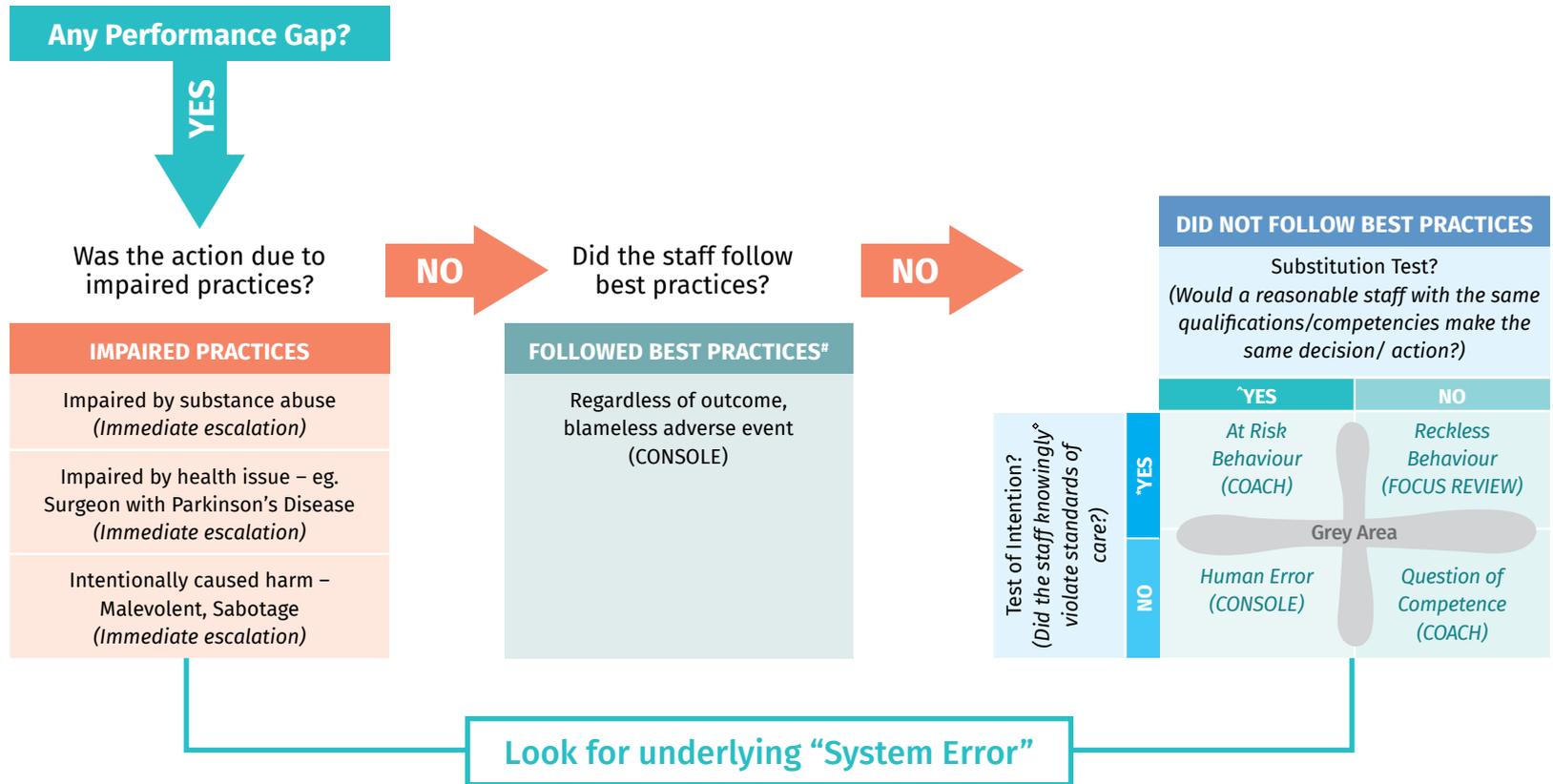
Separately, in 2015, TTSH Nursing implemented its own Just Culture tool, after the Nursing department and Clinical and Standards Improvement department found that the Incident Decision Tree lacked steps to guide supervisors on the next course of action.

To tackle this, the nursing department adapted a Just Culture tool from Montefiore University Hospital. The tool, which is similar to the Incident Decision Tree, was shared at an overseas quality conference and was adapted after TTSH had sought permission from Montefiore University Hospital to do so.

The modified Just Culture tool helps guide nursing supervisors to evaluate staff involved in errors without bias or judgment, while at the same time, learn from errors and fix the underlying system issues in order to provide a safe environment for patients.

Two years later (2017), the tool was introduced to TTSH Medical and Allied Health Professional staff. Thereafter, with every IRIS report received, the Just Culture tool would be run through with supervisors, where applicable.

MODIFIED JUST CULTURE TOOL (adapted from Montefiore's patient safety program)



#Best Practices

- > Hospital guidelines & policies
- > Standard Nursing Procedures & Practices
- > If absence of the above, refer to the available literature and peer review

^Evaluate the presence of "Normalisation of Deviance"

- > Gradual drift away from the best practices until a deviant behaviour is commonplace among staff (eg. ignoring an alarm, bypassing a safety check)

***Reckless Behaviour (violate standards of care)**

- > Medications -Did not adhere to 2 patient identifier

Grey Area

- > Highlight the incident to Nursing Quality Department
- > Proceed to Peer Review Process in need be

^Knowingly violate

- > Staff carries out an unsafe action despite knowing the risk

> TTSH nursing implemented its own Just Culture tool in 2015, adapted from Montefiore University Hospital

MODIFIED JUST CULTURE TOOL (adapted from Montefiore's patient safety program) - continued from previous page

MANAGEMENT

	FOLLOW BEST PRACTICES	DID NOT FOLLOW BEST PRACTICES			
		HUMAN ERROR	QUESTION OF COMPETENCE	UNSAFE ACTS	
				AT-RISK	RECKLESS
SYSTEM MANAGEMENT	Manage through changes in: <ul style="list-style-type: none"> ➤ Choices ➤ Processes ➤ Procedures ➤ Training ➤ Design ➤ Environment 	Manage through changes in: <ul style="list-style-type: none"> ➤ Choices ➤ Processes ➤ Procedures ➤ Training ➤ Design ➤ Environment 	Manage through changes in: <ul style="list-style-type: none"> ➤ Removing incentives for at-risk behaviours ➤ Creating incentives for healthy behaviours ➤ Increasing situational awareness 	Manage through changes in: <ul style="list-style-type: none"> ➤ Removing incentives for at-risk behaviours ➤ Creating incentives for healthy behaviours ➤ Increasing situational awareness 	Manage through: <ul style="list-style-type: none"> ➤ Remedial action
SYSTEM MANAGEMENT	CONSOLE <ul style="list-style-type: none"> ➤ Reassurance ➤ Support ➤ Learn 	CONSOLE <ul style="list-style-type: none"> ➤ Reassurance ➤ Support ➤ Learn 	COACH <ul style="list-style-type: none"> ➤ A supportive discussion with the staff – correct practice ➤ Provide specific feedback and set target on the staff's performance ➤ To evaluate staff practice using Clinical Performance Evaluation (CPE) 	Note: History of unsafe acts should be taken into account <ul style="list-style-type: none"> At-Risk x 1 ➔ COACH At-Risk x 2/ Reckless x1 ➔ FOCUS REVIEW (PIP) At-Risk x 3 ➔ ESCALATE to Nursing Service (Quality) Reckless x 2 Progressive DISCIPLINARY ACTION <ul style="list-style-type: none"> ➤ Minor: Counselling, Verbal warning ➤ Major: Written warning, Termination 	

PATIENT AND STAFF SUPPORT

When an adverse event takes place, it is important to examine and address issues pertaining to three areas: patient, staff and system.

This includes investigating the severity of the harm suffered by the patient, the degree of culpability of the staff, what system issues led to the error and how to close these gaps.

But adverse events are stressful and traumatic for healthcare workers. Faced with emotional struggles and the lack of a process to handle such situations, they may inadvertently delay or avoid disclosure to patients and their families.

“This affects the relationship between staff and patients, who want to be truthfully informed,” said Prof Tai. “They want the healthcare team to be accountable and journey forward with them.”

To help manage incidents, NHG established a complaints resolution framework and began training staff and management in open communication and mediation.

Subsequently, institutions formed Clinical Incident Management (CIM) teams – which comprise expert managers, senior clinicians and legal counsel (where appropriate) – to handle serious patient incidents.

The CIM team meets as soon as possible after a serious incident to ascertain information on the incident, determine the institution's responsibilities, look into the immediate support needs of the patient and staff involved, and identify other important considerations for discussions with the patient and family. They also help to arrange and provide a controlled environment for open communication or disclosure with patients and their families.

Rebuilding trust

With hospitals facing an increased workload and rate of complaints, encouraging openness between the healthcare team and patients can help rebuild trust and resolve disputes.

At TTSH, the complaints resolution process was first established in 2005, with its senior clinicians – as well as those from other NHG institutions – undergoing CIM training by Cognitive Institute.

“These efforts have helped the hospital achieve more than 80 per cent resolution for serious adverse outcome cases from 2004 to 2010, while keeping its insurance cost stable, despite an increase in patient workload,” said Prof Tai, who was TTSH ACMB at the time. “These good results encouraged us to do more in open disclosure.”

Then in 2008, NHG's Clinical Board endorsed NHG Clinical Governance and adopted open disclosure (OD), to encourage open communications after an adverse event. NHG's HODs and senior consultants were sent for OD training.

The OD rollout helped TTSH achieved amicable conclusions for all parties for all 40 cases they handled from 2009 to mid-2010, with no medico-legal cases in open court, Prof Tai noted. More importantly, OD helps the institution maintain and restore their relationship with affected patients and caregivers.

(Patients) want to be truthfully informed. They want the healthcare team to be accountable and journey forward with them.”

ADJ. A/PROF TAI HWEI YEE

We now have a better safety culture. More incident reports are generated when in the past such incidents were just swept under the carpet.”

DR ANTHONY GOON

In May 2017, NHG introduced an integrated Incident Management, Open Disclosure/ Open Communication and Second Victim Support Framework. The framework aims to foster an environment where patients, caregivers and healthcare professionals can feel supported when adverse events occur.

The NHG policy states that an open and consistent approach should be adopted when communicating with patients, caregivers and families. The guiding principles for open communication/disclosure include:

- a) Acknowledgement by healthcare institutions of adverse outcomes or events as soon as they are identified.
- b) Openness, truthfulness and timeliness of communication with provision of factual information of the incident.
- c) Apology / expression of regret (must not include speculative statements, admission of liability, apportioning of blame).
- d) Recognising the expectations of patients and caregivers and treating them with empathy and respect.
- e) Confidentiality of patient and staff involved to be maintained in accordance to the institution’s policies.
- f) Ensuring continuity of care to patients which may include referral to expert for second opinion, financial assistance for therapy, nursing care, alteration to home.
- g) Providing professional and emotional support to the staff involved.
- h) Integration of findings from incident investigation / review into risk management and systems improvement.
- i) Ensure multidisciplinary accountability and response especially in incident investigation and clinical risk management.
- j) Good governance of patient safety and quality improvement process by organisations to ensure that changes are implemented and their effectiveness reviewed.

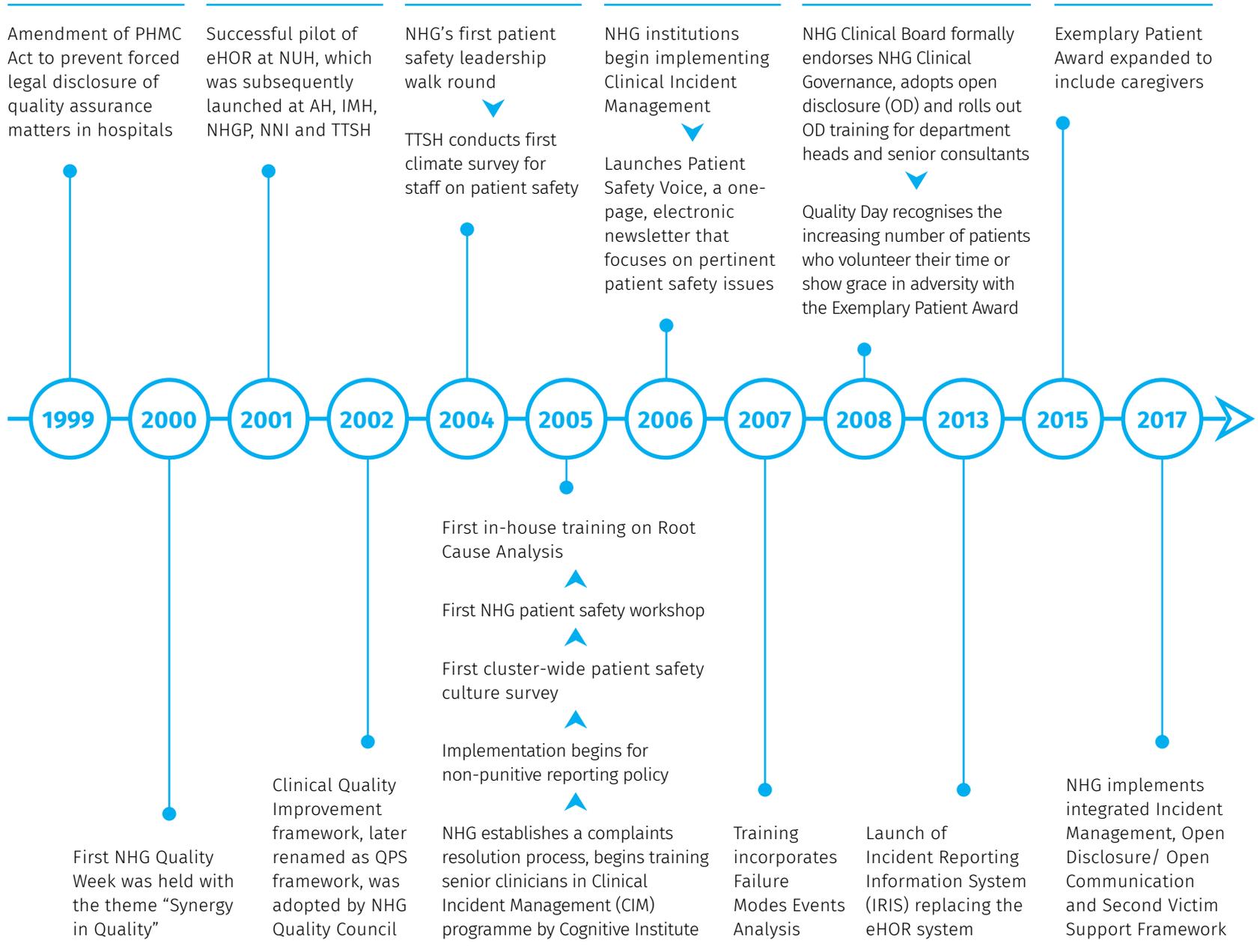
Helping the “second victim”

At the same time, it is important for the staff to know that they are supported by management after an adverse event.

The framework highlights support for “second victims”, or healthcare providers involved in the adverse event, who require psychological support. Often, staff feel shame, guilt and self-doubt, and need to feel they are not being unfairly judged.

NHG’s institutions have numerous channels for second victim support, with contacts for counsellors made available to staff. IMH, for instance, has a Staff Support and Assistance Programme (SSAP) that provides emotional support to staff for work-related incidents or trauma. A separate doctors’ peer support group also provides counselling and guidance for doctors affected by adverse incidents.

TIMELINE



REFLECTIONS



Ms Kwek Puay Ee
Executive Secretary,
Singapore Nursing Board

Before 2000, the culture in healthcare was one where most nurses didn't have a voice. They won't answer back or give feedback. So when I became Director of Nursing in September 2001, I wanted to have an "open door policy" where people could come to me anytime with feedback. I had to show my staff that I wanted to listen to them.

Back then, many of the feedback sessions were formal, so what I did was to hold regular sessions, both formal and informal. Formal ones were held during townhall or nursing forums, while informal sessions were held during ward rounds and walkabouts. I also built relationships with my nursing officers and worked through them to reach out to ground staff.

At the start, the nurses talked more about bread-and-butter issues such as shift hours and leave, so these sessions were not strictly related to Just Culture or non-punitive culture. But they were important for building trust and rapport. Without this, it would have been very difficult to encourage them to do reporting. I also started a staff suggestion scheme for nurses in 2002 where they could make suggestions or list concerns without putting their names down.

Encouraging voluntary reporting took a bit of pushing during my tenure but the culture was built over time. My colleague Mr Yong Keng Kwang, now TTSH's Chief Nurse, really helped to drive the quality aspects on the ground.

Nurses make up 40 per cent of the workforce, so inculcating Just Culture required support from administrative and operations staff, as well as CMBs. Leadership accepted our suggestions and supported us, and we built awareness through newsletters such as CEO Tribute and Nursing Pride.

On a personal front, I am thankful I didn't have many bad experiences with speaking up as a nurse. When I was in the geriatrics ward (from 1988 to

2001), we encountered numerous falls. However, because we wanted to encourage ambulation, we had to let our patients walk. I could speak up when I was there. We (nurses) were considered equals with doctors and we knew that we wouldn't be reprimanded if we reported incidents; instead, a root cause analysis would be conducted.

I think nurses these days are more vocal compared to when I first started out 30 years ago. In the past, nurses were viewed more as doers, or frontline staff who cleaned and fed patients. But it's no longer that way. There are many different career tracks for nursing now, and nurses feel more empowered and confident to voice out when things are not right. But there will still be some nursing staff who don't wish to report voluntarily. It's natural to worry about owning up. Attributing blame to an Individual may still happen, because blame is a matter of perception and that is something that can't be controlled.

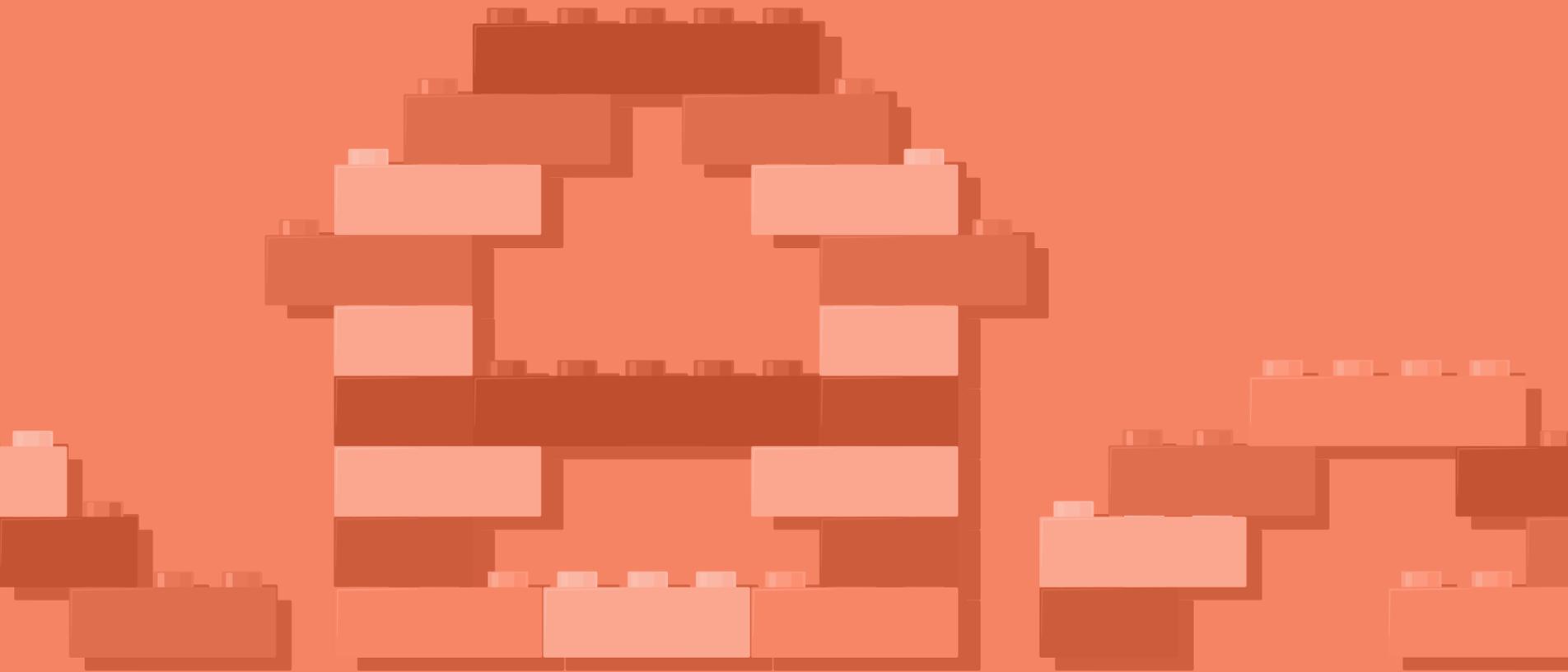
At the end of the day, it's about joint responsibility and it starts from leadership. The organisation and supervisors need to be open-minded that things can go wrong, but believe such errors are usually not committed on purpose. Whenever a staff makes a mistake, we should trust that the decision they made was to the best of their ability and knowledge at that point in time.

Leaders must take the lead to show that staff won't be punished when they report errors. It's more than just saying that they won't be blamed; leaders should share anecdotes and praise their reporting, because they are giving themselves and others a chance to rectify and improve.

Reporting helps us to collect data and observe trends so that measures can be taken to improve patient safety. By bringing to light the issues faced, management can help relook manpower and resources. Line managers in turn feel supported. They can see the advantages of feedback, reporting and improvement. It's a win-win for everyone.

06

**BRICK BY
BRICK**



BRICK BY BRICK

Redesigning the way NHG approaches patient safety

Singapore has always prided itself on providing world-class healthcare. But for several NHG leaders, one question has always bugged them: Who says so?

One of them was Group Chief Quality Officer (GCQO) Nellie Yeo, who felt strongly that the cluster should go beyond MOH licencing standards to look at accreditation.

As Singapore had no such expertise, she visited other countries to look at the alternatives.

After reviewing available accreditation systems, like the Australian Council on Healthcare Standards (ACHS) and Canada's Health Standards Organisation, she felt that the Joint Commission International (JCI) system would be most suited for NHG adoption and could provide the necessary framework for NHG to achieve its quality and patient safety goals.

Then she spent a week in Chicago at a JCI workshop to learn about the agency and its standards. This helped to confirm the initial conclusion.

One advantage of JCI – which was the overseas arm of the United States' main accreditation agency – was that it had already gone through various iterations and received inputs from an international panel, making it easier to operationalise, she recalled.

An accreditation award is valid for three years unless revoked by JCI, after which it must be re-evaluated for renewal.

Mrs Yeo also liked that JCI had components for improvement, risk management and leadership. The JCI standards were aspirational in nature and highlighted the best practices based on current evidence-based knowledge.

"If you're not yet meeting the standard, how do you improve? If you identify a risk, how do you mitigate it? What roles do your leaders play?" she said. "These were all covered. We were introduced to a new language, a new way of looking at system standards. Healthcare in its complexity should have safety as its system property."

With this in mind, she flew home and told NHG's senior management: "We should go with JCI."

AN INTERNATIONAL YARDSTICK

JCI had been shown to be an effective quality evaluation and management tool, crucial in helping healthcare organisations assess their level of performance and compliance, in relation to well-established standards designed to improve the quality of care.

Nevertheless many factors had to be considered by the senior management of NHG and the institutions, not least of which was the aspiration and commitment of the leadership and entire organisation to undertake this long journey and constantly meet evolving standards to improve the way that we cared for our patients.

Before becoming the first hospital in Singapore to attain JCI accreditation in 2004, NUH had to spend eight intensive months to prepare, heavily involving 70 mostly clinical staff as well as 20 senior personnel in a main committee driving the effort.

But the benefits of JCI – uniquely developed for healthcare and directly addressing clinical excellence and key healthcare delivery processes – eventually tipped the scales in favour of accreditation.

By 2008, all of NHG's institutions were JCI-accredited.

Former NHG chairman Michael Lim wrote in NHG's annual report 2005/6 that JCI accreditation backs up the claim that the cluster has one of the best healthcare systems in the world.

"This is an affirmation of the NHG quality journey that we have committed ourselves since day one," he said. "To patients, JCI accreditation is the assurance that they will receive world class care from any of our institutions."

Dr Hwang Chi Hong – who started work on JCI accreditation preparation a year after he became head of NHGP's quality management office in 2006 – said JCI was useful for polyclinics because they could reference standards specific to primary care.

In contrast, he recalled the earlier discussions that took place during patient safety officer cluster meetings tended to be more relevant for hospitals – for example, wrong-site surgeries, from which he had to translate into primary care practice standards.

But in its initial stages, some staff needed convincing about JCI's importance, as it made them "feel like they were being checked and having standards put on them". So Dr Hwang started off by working with more supportive people and focused on JCI's benefits for patients.

"Don't just tell the staff 'JCI said you have to do this'," he said. "A lot of people are in healthcare because they want to help patients, so I used that to appeal to them by explaining how JCI standards ensured good standards of care for patients."

For NSC, one challenge was understanding how JCI standards can be applied in the local context. To overcome this, a NSC-JCI steering committee was formed by appointing Chapter champions as well as team members to study, interpret, write and operationalise the guidance provided by

the standards into policies, standard operating procedures and work instructions on the ground. They also sought guidance and advice from other NHG institutions like TTSH and IMH.

NSC would become the first ambulatory centre in South-east Asia to obtain JCI accreditation. NHGP soon followed suit in 2008, becoming the first primary care organisation outside of the US to be accredited by JCI.

NHG institutions are still reaping benefits more than 10 years since they first embarked on JCI accreditation. NSC for example adopted the two-patient identifier for all healthcare provider and patient interactions and formalised the NSC Quality Assurance Committee that continues

to address quality and patient safety-related matters today.

One benefit of JCI was that it provided a common focus and challenge that united all staff, noted Mrs Yeo. Indeed, JCI-related changes extended to departments such as HR and facilities management, as standards for non-clinical issues including primary source verification, staff orientation and emergency preparedness are addressed as well.

"By going for repeat accreditation, we kept improving and putting in wedges that prevented us from backsliding," she said. "Up till today, JCI remains the gold standard in healthcare accreditation."



➤ A pre-audit check conducted at NSC in 2007 in preparation for its first JCI accreditation



➤ A meeting to open the audit session was held with JCI auditors on the first day of the NSC's JCI audit in Nov 2007

CHANGING THE WAY WE WORK

At a lecture at TTSH in 2017, visiting patient safety and quality expert Kaveh Shojania from the University of Toronto flashed a cartoon of arguably the world's most complicated pencil sharpener.

In it, a window is opened, releasing a kite that pulls a string that releases moths that chew on a shirt, which moves a boot to turn on a switch for an iron and so forth, until a cage is finally lifted, releasing a woodpecker that sharpens a pencil.

That cartoon by American cartoonist Rube Goldberg – who is known for depicting simple tasks performed in convoluted ways – was Dr

Shojania's analogy for the complexity of today's healthcare systems.

Complex systems inadvertently include unnecessary processes and waste, which in turn affect the quality and possibly safety of care. Hence the need for redesign, or changing the way we work.

According to the BMJ, redesign in healthcare is represented as a “radical challenge to traditional assumptions and practice which involves thinking through the best process to achieve speedy and effective patient care, identifying delays, unnecessary steps or potential for error, and redesigning the process to improve the quality of care.”

Besides eliminating waste, minimising failures and creating value, redesign in healthcare help hospitals manage resources and staff workload, to cope with the growing healthcare demands of Singapore's ageing population.

Lean into it

In 2008, NHG launched the MyCare framework, which aimed to streamline and improve existing work processes. It does so by removing waste and viewing healthcare experience and value from the patient's perspective, to deliver “faster, better, cheaper, safer” care.

By going for repeat accreditation, we kept improving and putting in wedges that prevented us from backsliding. Up till today, JCI remains the gold standard in healthcare accreditation.”

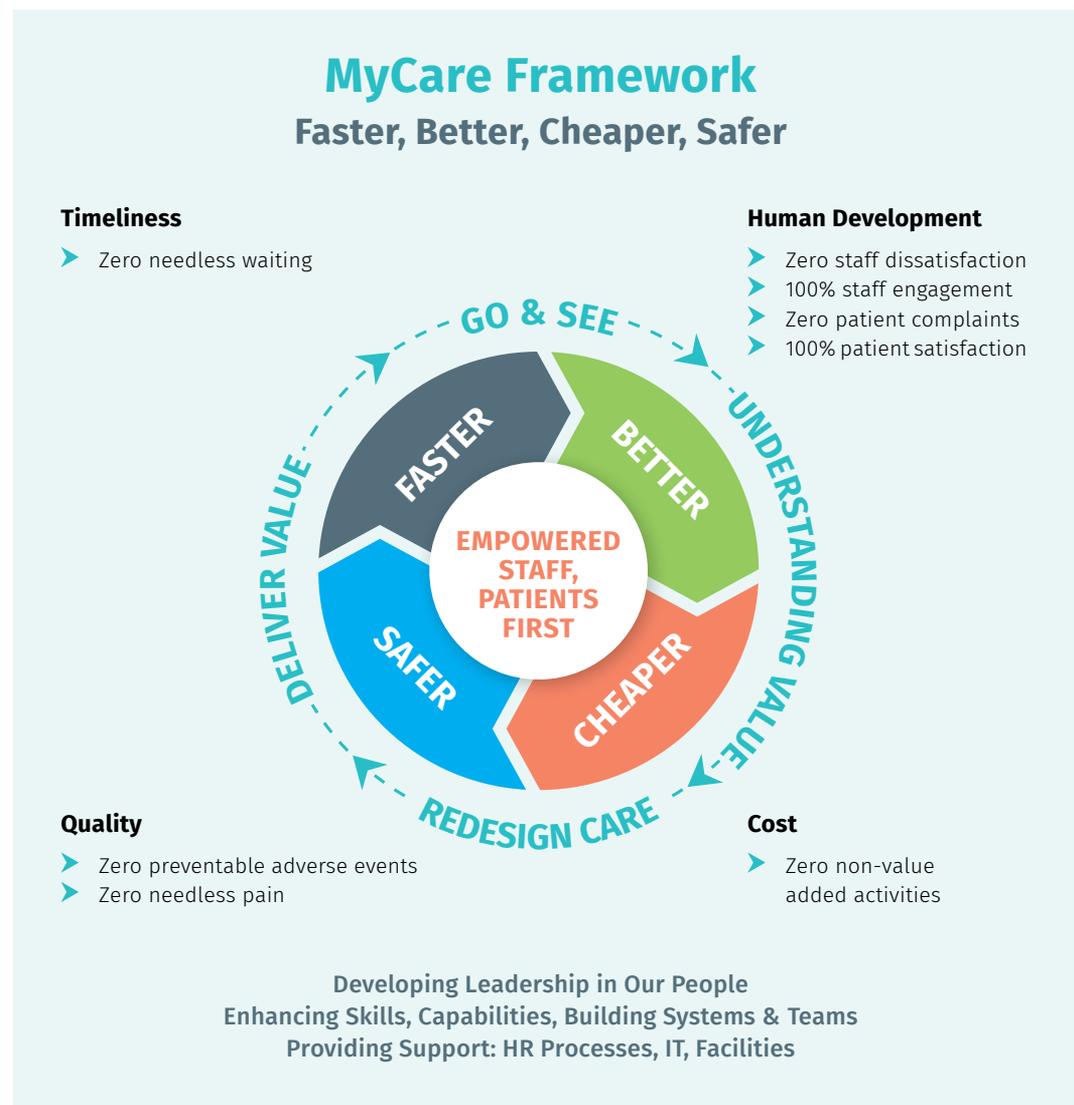
MRS NELLIE YEO

MyCare is underpinned by Lean principles from the Toyota Production System (TPS), which evaluates the value of a process by distinguishing the value-added steps from the non-value added ones, and eliminating waste so that ultimately, every step adds value to the process.

Lean methodology aims to improve reliability and reduce variability, using tools such as value stream analysis (VSA), 3P (production process

preparation), 6S (safety, sort, straighten, shine, standardise, sustain) and so on.

Like the Clinical Practice Improvement Programme (CPIP), Lean methodology employs improvement science and trains users to view healthcare as a process, noted NHG deputy GCEO Chua Hong Choon. “They brought manufacturing standards to healthcare, helping us see our work through a different lens.”



Many Lean projects were tested and implemented throughout NHG, creating daily improvements that lead to safer care, greater efficiency and better patient experience.

KTPH

a) Trolleys

Since 2006, Alexandra Hospital – today's KTPH – has adopted TPS principles in their improvement projects. It focused on three types of “flow” under Lean management: material, information and patient. With these elements, the patient can experience safe and hassle-free care.

One initiative and example of improved “material flow” which helped patient safety was the Phlebotomy C.O.W. (Computer on wheels), a trolley which contained items needed for blood-taking and intravenous cannulation procedures.

The trolley was pushed to the patient's bedside when blood needs to be drawn, after which the tubes are immediately labelled and placed into bags for transfer to the laboratory via the pneumatic tube system. This “one-piece flow” based on Lean principles helped to reduce the likelihood of labelling errors as there is no break from one task to another.

Another similar initiative was the “Kaizen trolley” which helped to deliver timely care to patients. It contained frequently used healthcare items and was placed outside each cubicle.



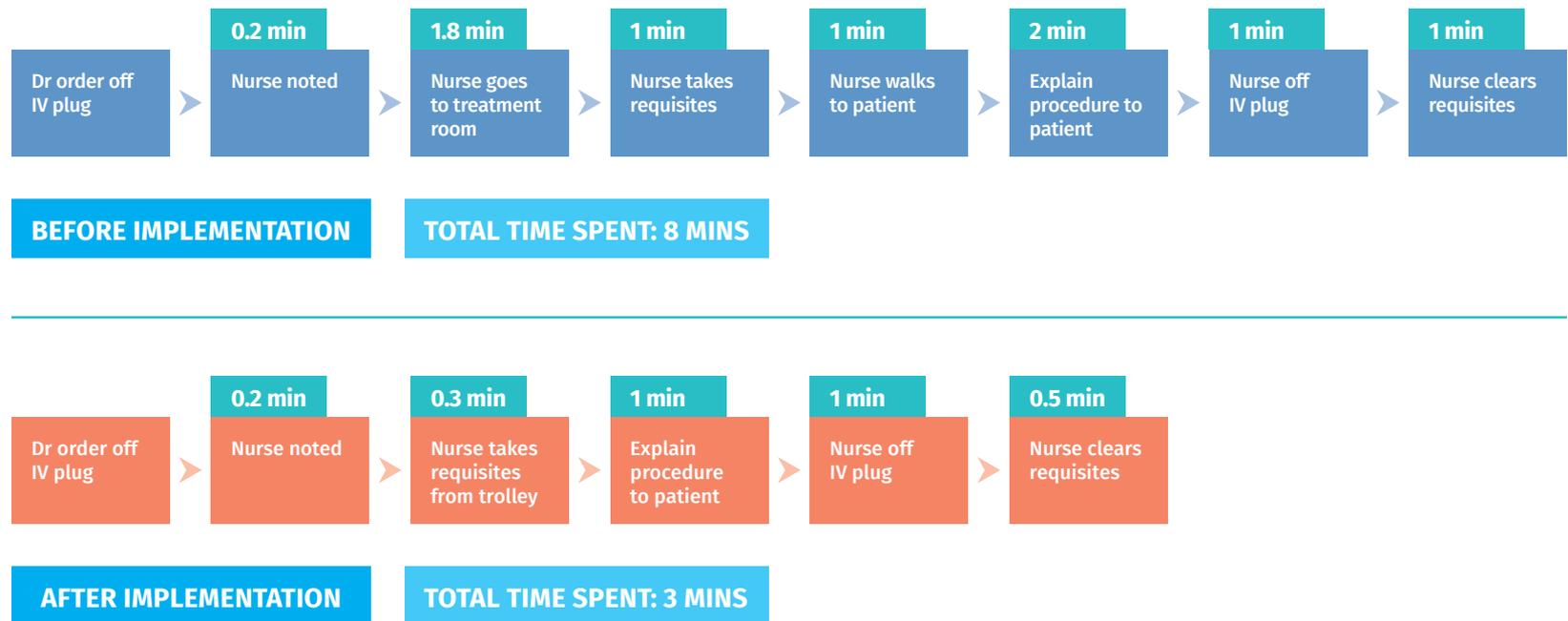
➤ The Kaizen Trolley was invented to enhance the workflow and efficiency of patient care. Through continuous improvement, this eventually resulted in other different custom-made trolleys used in KTPH wards

The idea for the trolley was born after a team of nurses realised that a lot of time was wasted going to the supply room for items such as intravenous plugs and alcohol wipes, resulting in delays and distractions when providing

care, which may in turn affect patient safety. Easy access to gauze from a Kaizen trolley, for instance, once allowed a KTPH nurse to more quickly stop the bleeding for a patient who had prolonged clotting time.

The initiative more than halved the amount of time needed for nurses to gather items (see diagram below) and the successful pilot was later spread to all wards in the hospital.

KTPH Kaizen trolley: Workflow before & after implementation



b) Andon boards

Andon is a TPS manufacturing term that refers to a visual system that uses indicators, displays and controls to improve the communication of information, similar to how a warning light on a car's dashboard quickly tells the driver that his petrol tank is close to empty. It comes from an old Japanese phrase for "paper lantern", which were used by fishermen as signals at night.

The software – which was integrated with the hospital's electronic medical records (EMR), radiology, laboratory and pharmacy systems – also allowed staff from different departments to swiftly communicate on patient procedures and tests. For example, during a pilot at five wards, a radiology scheduling function was shown to have eliminated 700 unnecessary phone calls per month between nurses and radiology staff.



ID	ICD	NAME	DEPARTMENT	TEST	STATUS
021	02	ANG K H	Chao L H A.M		
024	02	SAN K S	Chao L H A.M		
4	02	SIB B B H	Chao L H A.M		
3	04	YEO P T	Chao L H A.M		
8	04	CHUNG A E	Chao L H A.M		
1	05A	ROO K P E	Chao L H A.M		
2	06	BURNING B M	Chao L H A.M		
6	07	MOORMAN B N	Chao L H A.M		
24	28	SAN B C	Sun W W W		
10	28	LAY LIMMAN S S R	Sun W W W		
11	30	HAMISH A C	Sun W W W		
4	11	SEF K B	Sun W W W		
5	11	ONG C B	Sun W W W		

➤ Andon board



➤ The Andon boards at KTPH help to provide nurses a quick view of their patients' issues and enable communications with staff from the radiology department

The Laboratory Andon Board, on the other hand, helps laboratory staff monitor tests and ensures that processes are running smoothly. If there are any deviations from set targets, the laboratory staff are alerted as these would be indicated on the dashboard, which can be seen by everyone.

It manages turnaround time (TAT) by displaying requests with the longest TAT first, while prioritised urgent tests will be highlighted if not completed. The system ensures that all tests across the hospital are accounted for.

c) Electronic patient identification

In 2014, Yishun Health implemented an electronic verification process to ensure their patients received compatible, cross-matched

blood for transfusion. This is crucial because it can be fatal for a patient to undergo transfusion using incompatible blood.

Verification is strengthened in two ways by this additional process.

Firstly, before undergoing transfusion, the patient needs to give a blood sample to test for compatibility. In the past, the staff asked the patient for his name and unique identification (such as NRIC) before taking the blood sample, to ensure the sample comes from the correct patient. A second person, either a doctor or a nurse, would manually confirm this was done correctly. Now, on top of manual verification, the patient's wristband is scanned to confirm his identity.

Secondly, in the past, before blood transfusion, the patient's name and NRIC was manually verified with the transfusion slip. Now an additional electronic verification is made by scanning both the blood unit's barcode and the patient's wrist band, to ensure that the right bag of blood is matched to the right patient.

These additional verification processes were only made possible after the relevant departments worked to link the laboratory's blood bank system to the hospital's electronic medical record system in 2017. Besides improving patient safety, the bi-directional link – a first in Singapore – allowed the laboratory to collect data that can be used to improve blood utilisation, reduce wastage and improve efficiencies.

d) Standardisation of care pathway for hip fracture patients

Since 2005, NHG institutions have been introducing clinical pathways, which have been shown to deliver safer, more consistent care. At KTPH, this was done for its elderly hip fracture patients, who had complex surgical, medical and rehabilitation needs.

Furthermore, this dovetails with the Lean concept of "patient flow", which is disrupted when there is a lack of a standardised approach and coordination between different disciplines. This can result in care fragmentation and inefficiency.

KTPH's integrated hip care pathway was developed in 2015 to provide a uniform care approach through a trans-disciplinary Hip Fracture Unit (HFU). It aims to improve care through early surgery, optimising medical condition and early discharge.

Almost half their patients had surgery within 48 hours and the HFU managed to achieve a low 30-day mortality of 1 per cent, which is comparable to best benchmarks, while reducing length of stay from 12.5 to 11 days. Medical complications were also lower when compared with international data and a local study published in 2013 (1.65 vs 8.6 per cent for deep vein thrombosis; 10.2 vs 24.0 per cent for urinary tract infection).

NHGP

Since 2006, NHGP has been applying Lean thinking principles into the redesign of their polyclinics, using tools such as value stream mapping (VSM) to create better patient experience and safer clinical care.

In 2008, NHGP named its quality improvement framework "OurCare". This framework incorporated Lean thinking principles to drive continuous improvement in quality and patient safety.



➤ NHGP's OurCare framework incorporates Lean thinking principles to drive continuous improvement in quality and patient safety

Tx & Dosing Services

PERSONA

Uncle Richard
God-daughter

70 years old
Retired and single
Former school Principal

POLYCLINIC EXPERIENCE + ATTITUDE

- polyclinic is 2 bus stops away from home
- takes a bus to the polyclinic every other day for dressing
- combative
- Expects to be served now!

WISHES, HOPES & DREAMS

Hope for full recovery & to continue to eat good food with for independence and the chance to travel the world.
Hope that God-daughter and family can visit him more often

PERSONAL HISTORY CURRENT & FUTURE CHALLENGES

- Well-respected in the education industry
- Financially independent
- staying alone in the East
- God daughter staying in the west
- Poorly controlled diabetes
- Loves to eat
- Unable to renew driving licence due to health condition
- currently visiting the Polyclinic for right leg ulcer & foot
- worried about his deteriorating foot ulcer, KIV amputation.

CHALLENGES

- ① mobility issue
- ② Diet
- ③ Injuries
- ④ medication
- ⑤ Hospitalisation

Technology

Information

Health Attitude

Dental!

HURT myself today

► NHGP staff participated in workshops to redesign patient journeys in the polyclinic. They experimented with different layout options and workflows to cater to a broad spectrum of differing patient needs

SOLVING A PRICKLY PROBLEM

More than one million patients are seen at NHGD's phlebotomy tables each year. As the primary working area for phlebotomists – and the area in which patients sit at for blood taking – it is essential to keep it safe for staff, patients and caregivers.

Before 2007, however, the phlebotomy table would have consumables and bins stacked on it. This posed a safety concern – in particular the toppling of the biohazard and sharps bin may jeopardise infection control and cause potential needlestick injuries.

Moreover, patients sat back to back and risked knocking into each other when they are sitting down or getting up to leave. There was also little privacy as patients could hear conversations taking place between other phlebotomists and patients.

As such, in 2009, NHGD redesigned the phlebotomy table to create a safer work area. Items were placed in drawers instead of being placed on table tops, and bins were built under the tables with universal colour codes to differentiate the types of waste.

The sharps bin (red), was placed furthest away from patients, followed by the biohazard bin (yellow) and general waste bin (black). A swivel arm rest was also built in for patients to rest their arm and to prevent unnecessary shifting which may result in sharps injury. In 2010, partition walls were added to ensure privacy. The table was made L-shaped and shelves were added to maximise space available for storage and workspace.

In 2015, a shutter was added on to prevent patients from accidentally reaching into the bins or consumables when the table is left unattended.



➤ NHGD's phlebotomy table was redesigned to improve its safety over the years. Above are different table designs from (left to right) 2007, 2009 and 2010



➤ To enhance safety, shutters (above, left) were added on to phlebotomy tables and swivel arm rests built in to prevent sharps injury during the procedure

SAFER, QUICKER LAB RESULTS

NHGD implemented a Laboratory Information System (LIS) in 2007 to upload lab orders and results directly into the EMR system, which minimises delays in treatment and the risk of losing hardcopy orders and results.

The direct link also eliminated the need for staff to manually key in laboratory results, which may result in transcription errors and affect patient safety. Furthermore, clinicians were able to view the records electronically in real-time to provide timely care.

To date, about 85 per cent of results at NHGD laboratories are transmitted electronically from analysers to LIS to EMR, allowing NHGD to maintain its one hour result turnaround time for patients waiting to see the doctor at polyclinics, despite a significant increase in test loads over the years.

In Oct 2010, NHGD also implemented an onsite biochemistry analyser in Choa Chu Kang polyclinic, which was subsequently rolled out to eight of NHGD's satellites located in NHGP and NUP polyclinics. More than 95 per cent of tests are now performed onsite without the need to send them to referral laboratories for processing.

As a result, the turnaround time of biochemistry test results was reduced from six to two hours, with urgent test results available in one hour. Almost all critical results (99 per cent) can now be managed during the office hours to provide timely care to the patients. It minimises the need to contact patients after office-hours, which could delay treatment if patients are not contactable.

Processing the tests onsite also minimises issues that may compromise sample integrity

when tests are transported from one lab to another. This ensures better accuracy of the test results and patients do not have to be recalled for a re-draw.

IMPROVING CLINICAL COMMUNICATIONS AND TEAMWORK

Providing safe care depends heavily on individuals acting together in the best interests of the patient. Teamwork and communication are hence essential to reduce patient harm, improve information flow and develop more effective interventions.

Effective teams consist of members who are comfortable expressing their safety concerns or questioning the decisions made by those in higher authority. Otherwise it may result in providing care with incomplete information, executing poor handoffs or failing to speak up when there is a problem.

As such, communication is key – and TTSH identified this as an area of concern early in its

patient safety journey. An unpublished study conducted in 2006 among more than 1,000 TTSH doctors and nurses found that one in ten of those surveyed believed that nurses should not question the decision made by doctors.

This was despite almost all doctors and nurses (97 per cent) believing that good teamwork and communication is as important as clinical competency for patient safety.

Furthermore, 77 per cent of doctors and 69 per cent of nurses encountered cases where patient care could be compromised because of ineffective nurse-doctor communication. Four in 10 nurses felt that doctors did not always give them adequate information and clear instructions when problems arise.

NHG introduced TeamStepps – adopted from the AHRQ TeamSTEPPS curriculum – to improve communication and teamwork skills. The evidence-based teamwork system was rooted in decades of research in high-stress, high-risk industries such as military aviation and later adapted for healthcare.



► An NHG TeamStepps training session in 2008

TeamSteps comprises four key skills: leadership, communication, mutual support and situation monitoring, which make up the core of its framework (see right). The red arrows show a two-way interplay between the skills and the related outcomes (knowledge, attitudes and performance).

It also includes specific and structured tools and techniques to communicate messages in an efficient manner, by bridging differences in communication styles and reducing the risk of misunderstandings. These include: the two-challenge rule, briefs, huddles, SBAR – a technique for communicating critical information – and read-back.

SBAR

SBAR is used when communicating critical information or a complex set of facts between members of a care team. It is usually used to inform a provider about a change in patient status, conditions or needs so that immediate action can be taken.

This technique reduces the likelihood of missed communications that occur as a result of unstated assumptions, hints or vague wording.

S – Situation

(What is going on with the patient?)

B – Background

(What is the clinical background or context?)

A – Assessment

(What do I think the problem is?)

R – Recommendation

(What do I think needs to be done for the patient?)

TeamSTEPS

Outcomes of Team Competencies

Knowledge

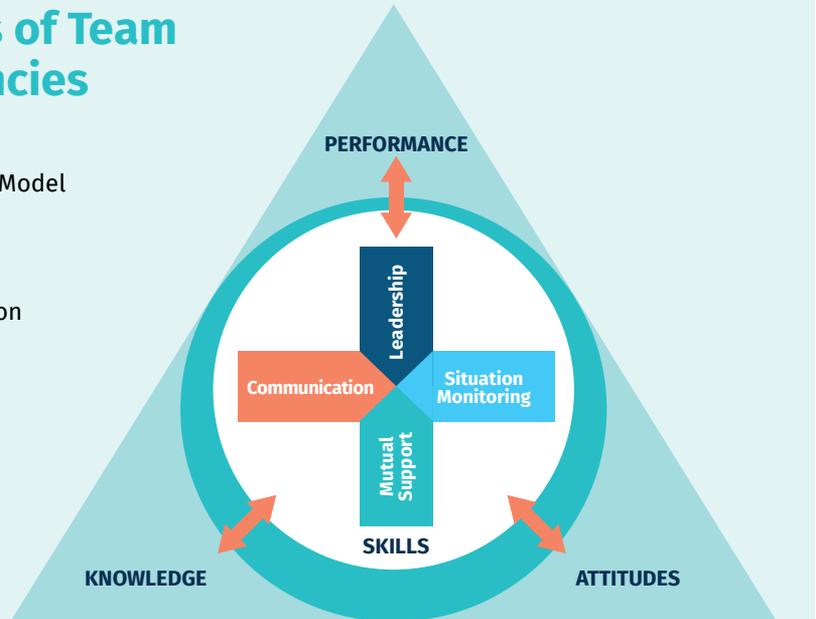
- Shared Mental Model

Attitudes

- Mutual Trust
- Team Orientation

Performance

- Adaptability
- Accuracy
- Productivity
- Efficiency
- Safety



- The TeamSteps Framework outlines leadership, communication, mutual support and situation monitoring at its core. The red arrows show a two-way interplay between the skills and the related outcomes (performance, attitudes and knowledge)

Two-Challenge Rule

When an initial assertion is ignored:

- It is your responsibility to assertively voice at least **two times** to ensure it has been heard
- The team member being challenged must acknowledge
- If the outcome is still not acceptable
 - ▶ Take a stronger course of action
 - ▶ Utilize supervisor or chain of command

CUS

I AM **C** ONCERNED!

I AM **U** NCOMFORTABLE!

THIS IS A **S** AFETY ISSUE!

“Stop the Line”

- Among the tools used in TeamSteps are the Two-Challenge Rule and CUS

Communicate With SBAR



BEFORE calling:

1. Assess the patient
2. Review the chart for the appropriate doctor to call
3. Know the admitting diagnosis
4. Read the most recent medical & nursing notes
5. Have the chart in hand & be ready to report **ALLERGIES, MEDICATIONS, IV FLUIDS, LAB & INVESTIGATION results**

SITUATION

- Your name & department, patient name & room number
- Problem(s) you are calling about

BACKGROUND

- Reason for admission & treatment to date
- Parameters & patient complaints (e.g. level of pain)
- Relevant physical findings, especially any change
- Pay special attention to mental status & skin temperature

ASSESSMENT

- Give your **CONCLUSIONS** to the present situation. Diagnosis is not necessary
- If situation is unclear, state the **body system** that might be involved
- State the **severity** of the problem(s)
- If appropriate, state the problem(s) could be life-threatening

RECOMMENDATION

Say what you think would be helpful which might include:

- | | |
|-----------------------------|-------------------|
| ✓ Add new medication | ✓ X-ray |
| ✓ ECG | ✓ Lab tests |
| ✓ Medical/specialist review | ✓ Transfer to ICU |

READ-BACK

- Read-back the complete treatment order

FOLLOW-UP ACTION

1. Document change in condition, communication process, treatment & actions
2. Ensure timely response
3. Escalate if:
 - Delayed response
 - Patient's condition deteriorates & needs urgent attention
 - Attending doctor needs assistance

Read-back

During emergencies or surgery, verbal orders can be particularly error-prone due to misinterpretation of speech. The simple technique of read-back helps to safeguard against that:

- Sender initiates message
- Receiver writes it down and repeats what he has heard
- Sender acknowledges that read-back is correct or makes a correction
- The process continues until both parties reach a common understanding

Briefing or huddle

A briefing or a huddle is a short, structured meeting where a team comes together to talk about a patient, procedure or situation. This ensures that everyone is on the same page as to what is going on, allowing people to clarify issues immediately, identify risks and plan for contingencies.

Debriefing

A debriefing takes place after the event and involves identifying what happened, what was learnt, what was done well and improvements that can be made in the future. Suggestions for improvement are documented.

Handoffs and transitions

Throughout a patient's care journey, a patient can be treated by many healthcare workers in different shifts and settings. Handoffs refer to the transfer of information during transitions in care. It includes the opportunity to ask questions, clarify and confirm.

➤ The NHG SBAR card was produced to help staff communicate critical information more effectively

But at times, handoff communications may omit essential information, or the information may be misunderstood, resulting in inappropriate treatment and patient harm. It may also lead to the omission of planned tasks, duplicative tests, delays in diagnosis and medication errors.

Apart from rolling out TeamSteps, institutions have also worked on improving clinical communications and teamwork. Here is a look at some of these initiatives and changes.

IMPROVING INFORMATION FLOW: YCH

When YCH first opened in December 2015, staff found themselves spending a lot of time screening referrals to decide whether or not a patient was suitable for admission to the community hospital.

Most referrals came from KTPH, but because they were faxed over, sometimes pages were missing or lacked crucial timely medical information for YCH doctors to make a decision for a safe and responsible transfer.

Aware that poor documentation and information flow delays patient transfer turnaround time (TAT) and could compromise patient safety, YCH formed a multi-disciplinary referral and admission workgroup. In March 2016 to examine this issue.

Working with KTPH doctors and the Clinical Informatics team, they decided to build an e-referral function onto KTPH's Sunrise Clinical Manager (SCM) system. This was beneficial because it enforced critical communication between the two hospitals, and automated work processes, such as pulling relevant medical information for the referral.

A communication log was also incorporated, which allowed the YCH and KTPH doctors to ask questions, and discuss and document a patient's status.

Clear communication and good documentation are critical for continuity of care and accountable practice for referrals, said YCH senior nurse manager Jesbindar Kaur. "This requires strong teamwork and an unwavering commitment to patient safety."

Moving online would also resolve issues such as missing fax pages and allow YCH doctors to access referrals from the wards instead of having to go back and forth from the admissions office.

After Yishun Health formally launched the e-referral system between KTPH and YCH in September 2016, YCH's TAT saw a significant improvement. From September 2016 to December 2017, the TAT for transfers between KTPH to YCH fell from 3.7 days to 2.1 days. The 43 per cent drop in median TAT was achieved despite a 63 per cent increase in the number of referrals during the same period.

The new initiative was estimated to have slashed operating expenses by \$1,300 a year. This also resulted in daily time savings for healthcare staff, which gives them more time to concentrate on patient care.

BETTER TOGETHER: NHG PHARMACY

Teamwork and collaboration is key to the success of NHG Pharmacy's medication safety workgroup, which was formed in 2008 to build a network for collective sharing, learning, brainstorming and formulating

safety initiatives. Regular meetings are held to address medication errors and safety concerns.

During the past decade, the workgroup has piloted many successful initiatives that enhanced patient safety. As the scope of work broadened, sub-workgroups were set up to focus on specific areas, to provide a conducive, small-group environment for raising concerns.

"In my nine-year journey, I've learnt the value of the collaborative approach in improving safety," said former principal pharmacist and chairperson of the workgroup Lim Mui Eng. "Collaboration provides fresh eyes to see blind spots, allows breadth for new insights and harnesses synergy to work towards common goals."

The teamwork extended beyond pharmacy staff as well, as some of their initiatives involved collaborating with Finance colleagues and drug manufacturers.

For instance, after conducting surveys on LASA ("look alike sound alike") drugs to assess the similarity and likelihood of mixing up certain drugs, NHGPh worked with Group Purchasing Office and drug manufacturers to minimise the risk of mix-ups. For example, changes to the drug packaging of Rosuvastatin 10mg and 20mg tablets were made to enable staff to clearly distinguish between the different doses.

PRE-CHANGE

Rosuvastatin 10mg tablet
(Back View)Rosuvastatin 20mg tablet
(Back View)

POST-CHANGE



- The back view of the tablet packaging was changed by the manufacturer following feedback so as to minimise the risk of mixing up Rosuvastatin 10mg tablets and Rosuvastatin 20mg tablets

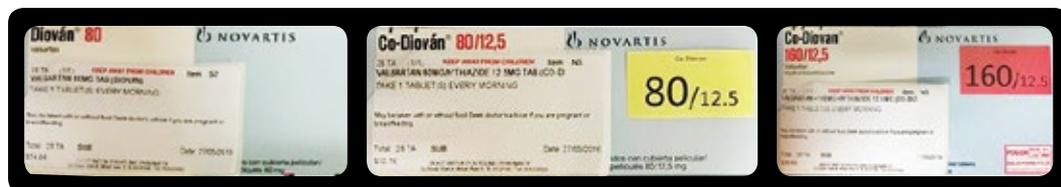
PRE-CHANGE



POST-CHANGE



- A red line is drawn across Thyroxine 75mcg to prevent picking errors



- Coloured stickers are used to differentiate between the two look-alike drugs Diovan and CoDiovan

When it was not possible for the manufacturer to change the packaging, the workgroup devised ways to differentiate look-alike drugs. For instance, a red line is drawn across Thyroxine 75mcg to prevent picking errors between Thyroxine 25mcg and Thyroxine 75 mcg, while coloured stickers are used to distinguish between Diovan and CoDiovan.

In 2013, a mammoth one-year project was undertaken to further reduce picking errors from spell-alike drug names, by reviewing and simplifying all drug names on drug labels.

The sub-workgroup focused on drugs with multiple strengths, dosage forms and salt forms, using tallman lettering to highlight the differences, and pointed brackets < > to indicate higher strengths. For long drug names and those with close similarities, proprietary names are used instead (see table on facing page).

	OLD DRUG NAME	NEW DRUG NAME
Different salts form	CALCIUM & VITAMIN D TAB CALCIUM ACETATE 667MG TAB CALCIUM CARB 625MG TAB CALCIUM CARBONATE 1.25G TAB CALCIUM GLUCONATE 10% INJ 10ML	calcium 450mg / VITAMIN D tab calcium ACETATE 667mg tab calcium CARBONATE 625mg tab calcium CARBONATE <1.25G> TAB calcium GLUCONATE 10% INJECTION 10ML
Different dosage form	BUDESONIDE <200MCG> TURBUHALER (PULMICORT) BUDESONIDE 160MCG,FORMO 4.5MCG T/H 120D BUDESONIDE 200MCG EASYHALER 200D (GIONA) CHLORHEXIDINE 0.05% 25ML/SACHET CHLORHEXIDINE 0.05% SOLUTION 500ML CHLORHEXIDINE 0.2% MOUTHWASH 200ML/250ML CHLORHEXIDINE 1% CREAM 15G	PULMICORT (budesonide 200mcg) TURBUHALER SYMBICORT (bude 160mcg, formo 4.5mcg) TURBUHALER GIONA (budesonide 200mcg) EASYHALER chlorhexidine 0.05% SACHET 25ml chlorhexidine 0.05% SOLUTION 500ML chlorhexidine 0.2% MOUTHWASH 200ml/250ml chlorhexidine 1% CREAM 15G
Spell alike drug names	INSULIN SOLUBLE 100U/ML INJ INSULIN ISOPHANE 100U/ML INJ INSULIN 30/70 1000IU/10ML INJ	ACTrapid INJ 10ML INSULatard INJ 10ML MIXtard 30/70 INJ 10ML
Long drug name and spell-alike	triamcinolone AQ SPRAY 120S (NASACORT) triamcinolone/LIDOCAINE 0.1/3% PASTE (ORACORT-E) 5G	NASACORT (triAMCINOlone 55mcg) AQ SPRAY 120s ORACORT-E (triAMCINOlone/LIDOcaine 0.1%/3%) PASTE

Besides improving internal communication, the workgroup also came up with ways to communicate better with patients for medication safety. For example, it created a Warfarin dose chart in 2009 to improve adherence to the complicated Warfarin dosing regimen, by shading the strength and number of the tablets patients would have to take.

In 2017, NHGPh took the Warfarin dose chart a step further by using an IT tool called the Warfarin Dose Chart Builder. By enabling auto-shading of the correct strength of Warfarin into the chart, copied directly from the prescription order, the IT tool reduced the risk of staff transcribing the Warfarin dose wrongly. The chart is printed on the spot and handed out to patients.

I've learnt the value of the collaborative approach in improving safety. Collaboration provides fresh eyes to see blind spots, allows breadth for new insights and harnesses synergy to work towards common goals."

MS LIM MUI ENG

DOSE	MON 星期 一 Dose 1	TUE 星期 二 Dose 2	WED 星期 三 Dose 3	THU 星期 四 Dose 4	FRI 星期 五 Dose 5	SAT 星期 六 Dose 6	SUN 星期 日 Dose 7
1mg	●●	●●	●●	●●	●●	●●	●●
2mg	●●	●●	●●	●●	●●	●●	●●
3mg	●●	●●	●●	●●	●●	●●	●●

Warfarin dose is important. Please take the correct number of tablets as shaded for each day.
 华发林的剂量很重要。因此服用适量的华发林很重要。请按照图上所标示的剂量，按时及正确服用药物。

Ubat warfarin adalah penting. Sila ambil jumlah pil yang ditamarkan dengan betul setiap hari.
 华发林的剂量很重要。因此服用适量的华发林很重要。请按照图上所标示的剂量，按时及正确服用药物。

- In 2017, NHGPh created an IT tool called the Warfarin Dose Chart Builder to reduce the risk of manual transcription error. The tool enables auto-shading of the correct strength of Warfarin into the chart.

CATCHING THEM BEFORE THEY FALL: IMH

Reducing the risk of patient harm resulting from falls is a JCI International Patient Safety Goal and a priority for IMH. With a large proportion of long-stay patients on psychotropic medicines and an ageing population of patients, the risk of falls is significant in this population of patients.

IMH has taken a holistic approach to dealing with falls. It formed a Fall Taskforce in 2013 – renamed as the Fall Prevention Workgroup in 2016 – to look into strategies and interventions on fall prevention and to streamline the process of fall risk identification and management.

The fall prevention workgroup goes beyond surveillance of falls to minimising injuries from falls, by training staff how to manage a fall and prevent further injuries. It has standardised the process of post-fall management and monitoring postural blood pressure.

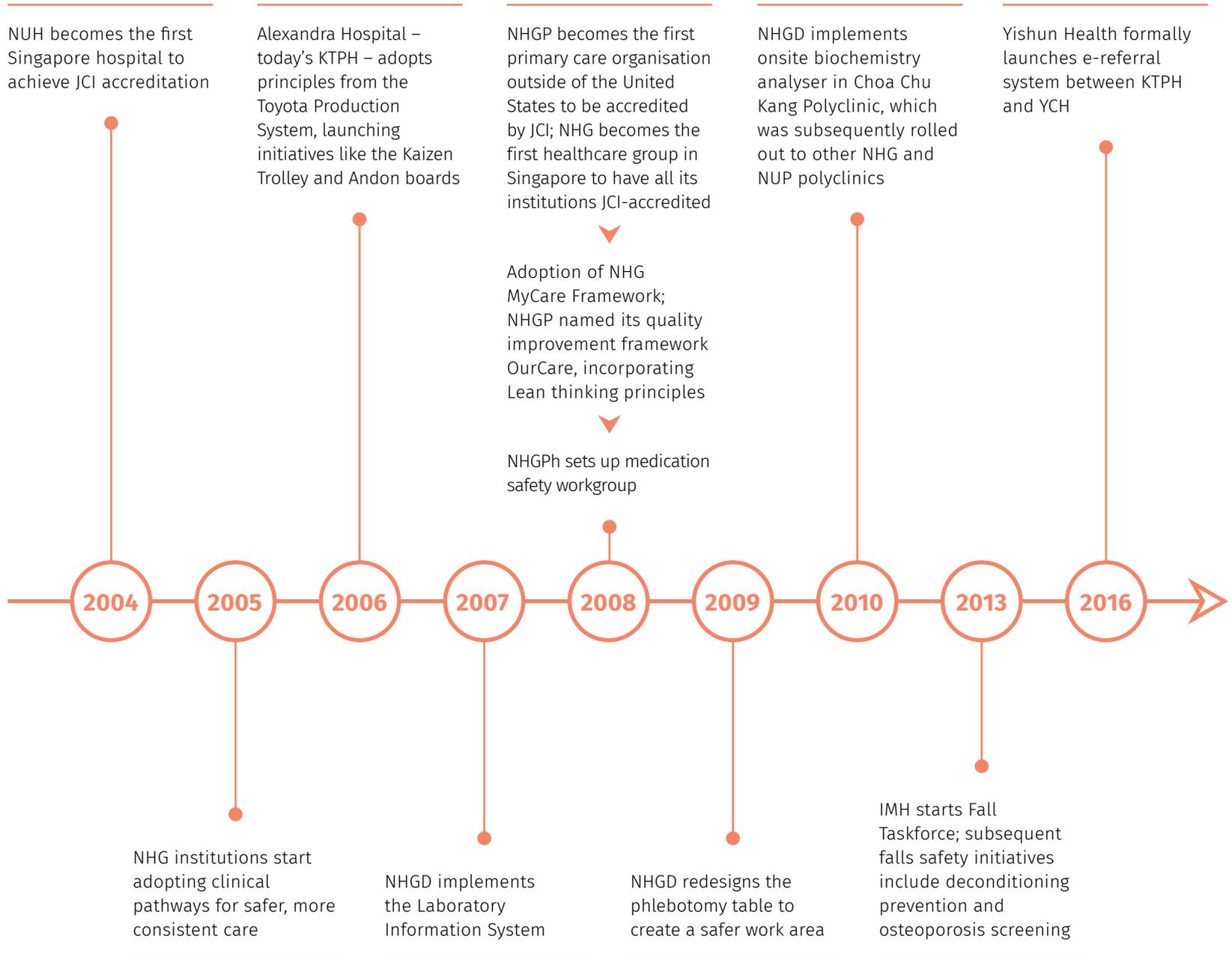
The workgroup also monitors falls trends. In one ward, it noticed the majority of falls occurred during night shift in the patients' toilet. The staff went on to develop specific interventions such as stationing staff near the toilets, greatly reducing fall occurrences.

In another ward which had significantly increased fall incident rates, an investigation found that ward renovations led patients to do their daily activities in the dormitory instead of the activity area – and the variation in their routine may have contributed to higher fall rates. Furthermore, ward nurses had to attend to contractors moving in and out of the ward, making it harder for them to monitor patients.

After understanding the background, the team worked with support service to develop interventions, such as having one support service staff attend to contractors, so nurses can concentrate on patient care. They also standardised this process for other wards to ensure that similar patient safety issues do not recur for future renovations.

Following the fall workgroup's formation, IMH quality improvement projects in subsequent years also tackled deconditioning to prevent decline in physical function among their patients, and introduced osteoporosis screening and treatment. An osteoporosis workgroup was formed in July 2017 to identify patients at risk of osteoporosis, especially among the younger age groups, and to provide appropriate early interventions.

TIMELINE



REFLECTIONS



Professor Chua Hong Choon
Deputy GCEO (Clinical), NHG

When JCI first came to IMH many years ago for a presentation, most IMH staff at the meeting had one of two reactions. They were either sceptical that it had any relevance to mental health, or daunted by the task that faced them if they attempted to get JCI accreditation.

To be honest, I was a bit worried as well. We were talking about 300 standards and more than 1,000 measurable elements. JCI accreditation felt unattainable.

Yet at the same time I was fascinated by JCI. I had never seen such a comprehensive set of standards and it came across as being a pair of “smart” fresh eyes, different from ISO audits, which are not healthcare-centric.

There was an additional incentive for IMH to go for JCI – it was an opportunity to legitimise mental health. Since we were surveyed like any other institutions, it meant that whatever standards you can apply to general health, you can apply to mental health.

It put our standards on par with general hospitals and was a sign that mental healthcare did not belong to some form of different, inferior system, which was how some people saw us in the past. If we chose not to do JCI, we would be excluding ourselves from developing the way general healthcare develops, which would have been a wasted opportunity.

So despite some reservations, I supported it and am an advocate until today. As a clinician I felt it was important to measure how we were doing, even if it was to show us where we were not doing well. Eventually we became the first mental institution in Asia to get JCI accreditation.

As IMH’s first PSO, I was in charge of quality and standards and I drafted a lot of standard operating procedures (SOP) for JCI. IMH had never really codified our work before that – we only wrote SOPs for areas that we thought necessary. Otherwise we just assumed that people know how to do things.

Actually by today’s standards – where practically everything has an SOP – this assumption was quite frightening. Yet it’s also a sign of how far we’ve come because of JCI. While there may be downsides to JCI, it’s clear that the benefits far outweighed any drawbacks.

07

**SUSTAINABLE
ARCHITECTURAL DESIGN**



SUSTAINABLE ARCHITECTURAL DESIGN

What we hope to achieve for the road ahead

The improvement of care is “not automatic”, notes IHI founding president Donald Berwick.

“It takes commitment, care and leadership,” he noted. “It takes what Dr W Edwards Deming – the great scholar of quality of the past century – has called the ‘constancy of purpose’ among leaders in the pursuit of continual improvement.”

So even as NHG has made significant strides in patient safety in the last 20 years, it continues to learn and improve, to make the journey more sustainable and inclusive. It aims to empower patients, care for them in the community and actively involve the patient’s perspective and needs.

PUTTING PATIENTS FIRST

Indeed, while healthcare was traditionally organised around the needs of the clinician and the organisation, NHG’s systems have been increasingly re-oriented to view care through patients’ eyes and to cater to their needs, preferences and values.

NHG’s annual report in 2002 said that patient focus group sessions are being held to get feedback on their needs, as these were “instrumental in helping us to improve continuously.”

Patient safety is also boosted by population health and the involvement of patients and caregivers, noted renowned healthcare innovation expert Goran Henriks, Chief Executive of Learning and Innovation, Qulturum, Jonkoping County Council, Sweden.

With an ageing population, increasing prevalence of chronic diseases and scarcity of resources, care in Singapore is moving from the hospital to the home and community, with NHG among the forerunners of this trend.

KTPH, for instance, has been running an Ageing-In-Place (AIP) programme, comprising home visits made to high users of hospital services and community nurse posts set up in Nee Soon and Sembawang to address population health needs.

It also collaborates with community partners for its network of three wellness and care centres called the Wellness Kampung, which aims to inspire residents in the north to lead healthier lifestyles.

“If we can increase the autonomy of patients and empower them to do it themselves, we can minimise safety risks,” said Mr Henriks. “Based on my own experience in Jonkoping, when patients are in control of the process, the clinical results are always better, because the patients personally understand and supervise the process.”

When there are potential obstacles, NHG institutions have sought to remove them. One such example is the lack of patient access to their own medical records. If patients cannot provide personal medical information when they see another doctor, they may end up repeating investigations or receiving inappropriate care.

When patients are in control of the process, the clinical results are always better, because the patients personally understand and supervise the process.”

MR GORAN HENRIKS



➤ NSC senior consultant dermatologist Steven Thng (right) receiving the Best Practice Award (Stakeholder Engagement) from Deputy Prime Minister Teo Chee Hean.

Delving into this issue, NSC conceptualised a patient health portal in 2010, allowing patients to access their records, including dates of visits, diagnoses, medication history, allergies and procedures done at NSC. The portal took about 18 months from design to launch and involved a team of doctors, nurses, pharmacists, clinical operations and IT staff. Patients were also roped in to test the portal.

One feature was to give patients direct access to their dermatologists through secured email, providing care at their fingertips. Minor issues, such as mild adverse drug reactions, can be handled almost immediately.

Furthermore, the portal provides information about their conditions and drug side effects, enabling patients to better understand and look after their dermatological health, and prevent deterioration.

The portal was officially launched in 2012. The following year, it was awarded the Best Practice Award (Stakeholder Engagement) at the 2013 Excellence in Public Service Awards.

Similarly, IMH has actively incorporated patient views into their safety and healthcare delivery. “It’s important to get patients on our side in the patient safety journey,” said CEO Chua Hong Choon.

To that end, the hospital has hired its patients as full-time employees and trained them to be peer support specialists (PSS), tapping on their experience of having gone through the system to critique its processes.

Prof Chua pointed out that IMH’s PSS have three main duties:

- Encourage, motivate and counsel fellow patients by sharing their own experiences
- Provide inputs on quality improvement and process redesign
- Advocate and educate the public on mental health services

“As healthcare workers, we sometimes assume people have lost their ability to reason because they are in IMH, in the same way that we may assume an old lady in a general ward doesn’t understand her situation – and we leave them out of the conversation,” he said. “That shouldn’t be the case.”

Furthermore, IMH regularly engages patients for their feedback in patient safety, such as when they were designing new wards for their Early Psychosis Intervention Programme (EPIP), which was opened in 2016.

Patients such as operations manager Adeline Tan, 31 (see facing page) were engaged in focus groups and process preparation, while feedback was sought from EPIP’s PSS.

Conversations with

Adeline Tan

“IMH sought my views as a patient when coming up with the safety guidelines in two aspects of their new EPIP ward, which they were planning to launch in 2016.

The first was for personal clothing – rather than patient gowns – to be allowed in the ward. I pushed strongly for this because I know patients want to look and feel good. From my own experience, I’ve always felt that wearing my own clothes make me feel more at home and less like a patient.

But we had to consider patient safety for personal clothing. So I helped them come up with guidelines for ‘safe’ clothes that do not increase suicide or assault risks, such as belts, shoelaces, studs and so on. We also had to consider appropriateness of clothing since this was a mixed-gender ward. These guidelines would then be given to the family of the patients, who would usually be the ones bringing patients clothes to change into.

The second aspect of the EPIP ward I helped to look at was time-out strategies and how to ensure they are safe.

From my personal experience in the wards, I felt time-out – a method that helps a patient calm down – was useful and I thought it would be good to incorporate various time-out options for patients in the EPIP ward, to help them cope with their triggers. Eventually the ward included music, a reading corner, an outdoor garden, a room for board games, and so on.

When we offer them these options to cope with their potential triggers, it can prevent escalation of emotions, which may cause patient safety



IMH sought views from former patients such as Ms Adeline Tan (pictured above left, with IMH operations manager Poon Lye Yin) when it was designing its new EPIP wards.

issues, such as if the patients hurt themselves or others.

But we also needed to consider safe design of these spaces. From my experience in a high-dependency ward, I knew that beanbags are comfortable to sit on, yet also too heavy to be picked up or kicked around. So I suggested using this instead of chairs in one of the time-out rooms.

Personally listening to the radio helps me relax too, but we didn’t want to have cables around,

so I suggested using wireless headphones and battery operated radios.

I went down to IMH for about four to five feedback sessions in 2016, with each one lasting more than an hour. While this may seem like it takes up a lot of my time – and I don’t get to use the services of the new EPIP ward – I’m happy that I’m heard and my feedback is valued. It shows that IMH respects patient input and gives us a chance to help them improve safety in their wards.”

“EPIP was very lucky to have various stakeholders contribute their time, thoughts and suggestions,” noted EPIP chief Swapna Verma. “Given that EPIP patients tend to be young adults accessing mental health services for the first time, we wanted to be sure that their initial contact with mental health services was not off-putting in any way, and that they felt empowered.”

Patient empowerment and family and community involvement are very valuable, Dr Berwick stressed. “One lesson learnt in the last decade around safety and quality is that the more patients and families have a voice, the more powerful they feel, the more we are focused on what matters to them, the safer care gets.”

In 2017, MOH conducted its inaugural Patient Experience Survey (PES) – revamped from the Patient Satisfaction Survey – to assess if patients are receiving care that is respectful of their needs, preferences and values in public healthcare institutions.

More than 4,400 patients and caregivers from NHG institutions were interviewed, most of them over the phone. NHG achieved a composite overall score of 87.9 per cent, comparable with the national score. Its areas of strength are: communication with nurses, doctors and allied health staff; waiting times; team-based care; and empowerment/care transition. Its areas for improvement include advice on medical bills for polyclinic, inpatient and community hospital settings.

STAYING SAFE AT HOME

Noticing a need to provide post-discharge care for patients with high medical or nursing needs at home, TTSH launched a programme called “Post-Acute Care at Home” or PACH in 2008. Another service called Virtual Hospital (VH) was added in 2012 for patients with greater psychosocial and functional needs.

With the launch of this new service, there was a need to look at implementing standards in transitional care, noted Dr Tan Kok Leong, who heads TTSH’s Continuing and Community Care department.

“For transitional care, we started by reviewing our work processes, taking reference from JCI standards that are relevant to home care,” he said.

One key task was standardising documentation, which was important as healthcare staff did not have access to electronic records from the patient’s home. Since everything was on paper, the only reference a healthcare worker had for a patient’s status was what the last staff wrote. If that was misread or misinterpreted, it could jeopardise the patient’s safety.

The use of e-documentation was gradually introduced starting 2014 with VH putting information onto PDF files and uploading them into TTSH’s internal C-Doc medical records system.

Subsequently, staff were given access to C-Doc and the National Electronic Health Record (NEHR), where they could view updated patient information and make informed decisions. The community health team also made arrangements to have read-access to NHGP’s patient notes and vice-versa.

Another important patient safety measure was medication review, Dr Tan said, as many of PACH’s patients are vulnerable, frequent admitters who get their medications from more than one pharmacy, leading to risks such as taking wrong medications or drug overdose.

Home visit teams were hence trained to observe the patient’s surroundings. If there were bags of medicines present, pharmacists would look through them, reconcile their medication list and update the information into C-Doc and NEHR. This acts as one of the safeguards against prescription errors.

For proper infection control, PACH and VH follow the hospital’s standards for hand hygiene and ensure that equipment and bags are properly wiped down after use.

Separately working with community partners to strengthen patient safety, NHGPh’s in-house team of intermediate and long-term care (ILTC) pharmacists published the Nursing Home Medication Management Guidelines in 2014. The guidelines cover a wide range of topics, such as how to store, administer and dispose of medicines safely and how to improve medication safety in the ILTC facility.

The guidelines were developed to address the need for a set of updated standardised reference materials for medication management in Singapore’s rapidly developing ILTC sector, to guide both nursing homes and NHGPh’s own ILTC pharmacists in their daily work.

“It took a lot of hard work from our pharmacist team to come up with the content,” said senior pharmacist Ng Ying Ru. “So I’m happy that the guidelines have been received warmly by the nursing homes, with some even referencing the guidelines when they design their standard operating procedures.”

A second version of the guidelines has since been released in 2017.

IMPORTANT VALUES

Singapore, like many developed countries, faces the challenge of caring for an ageing population. By 2030, the number of seniors aged 65 years and above will almost double to 900,000.

For sustainability, it is important to look at Value-Based Care. This goes beyond merely reducing cost, as better value also involves delivering safer and more clinically effective care which improves outcomes.

The Outpatient Pharmacy Automation System (OPAS), a collaboration between TTSH, NUH, NHGPh and Integrated Health Information Systems (IHIS), is one example of how process improvement creates value for staff, patients and the organisation while improving patient safety.

OPAS is an automated dispensing system that integrates different technologies such as medication picking robots, conveyors, LED and barcodes to enable the packing and dispensing of large volumes of medications at a faster rate with high accuracy.



► TTSH's community health team conducts home visits and does medication reviews for patient safety

It took a lot of hard work from our pharmacist team to come up with the content. So I'm happy that the guidelines have been received warmly by the nursing homes, with some even referencing the guidelines when they design their standard operating procedures."

MS NG YING RU

The ROWA Vmax, for example, is a high speed medication dispensing machine which picks boxes of drugs at an accuracy rate of 99.96 per cent. In cases where drugs have to be picked manually, coloured LED lights installed on shelves guide pharmacists to pick the correct medication.

Using the technology has helped to save manpower. At the TTSH main pharmacy, only 13 technicians are needed to pick and pack, compared to 32 previously. This means they can be redeployed to go through prescriptions with patients and seek clarifications with doctors

when necessary. Pharmacists are also able to focus on final checks before dispensing, and medication counselling for patients.

OPAS has been implemented at all NHGPH branches following a pilot of the system at Choa Chu Kang polyclinic pharmacy in June 2014. Since implementation, picking and packing error rates at NHGPH branches have reduced by 67 per cent from 2013 to 2017. The cost avoidance of medication errors is about \$270,000 per year. OPAS has been fully operational at TTSH's main pharmacy since December 2014.



➤ The ROWA Vmax machine at NHGPh has automated 80 per cent of the chronic medication picking workload at the pharmacy and lowered packing error rates



➤ Each machine has two robotic picking arms which shorten prescription fulfilment time by allowing simultaneous picking of drugs from the glass shelves inside ROWA

SPREADING SUCCESS

While there are many successful quality improvement projects which have enhanced patient safety, they often remain within the ward or department where it was first implemented.

Teams may not think about spreading initiatives, or find their ideas rejected by others. Opportunities to standardise processes, reduce work duplication and benefit patients are hence lost.

In 2018, NHG introduced a Spread-and-Scale Framework and toolkit to support institution leaders and improvement teams to scale up and spread their projects. It outlines a step-by-step approach to achieve improvement throughout the organisation by:

- Planning for scale-up and spread from the beginning
- Identifying the necessary resources
- Engaging leadership for support

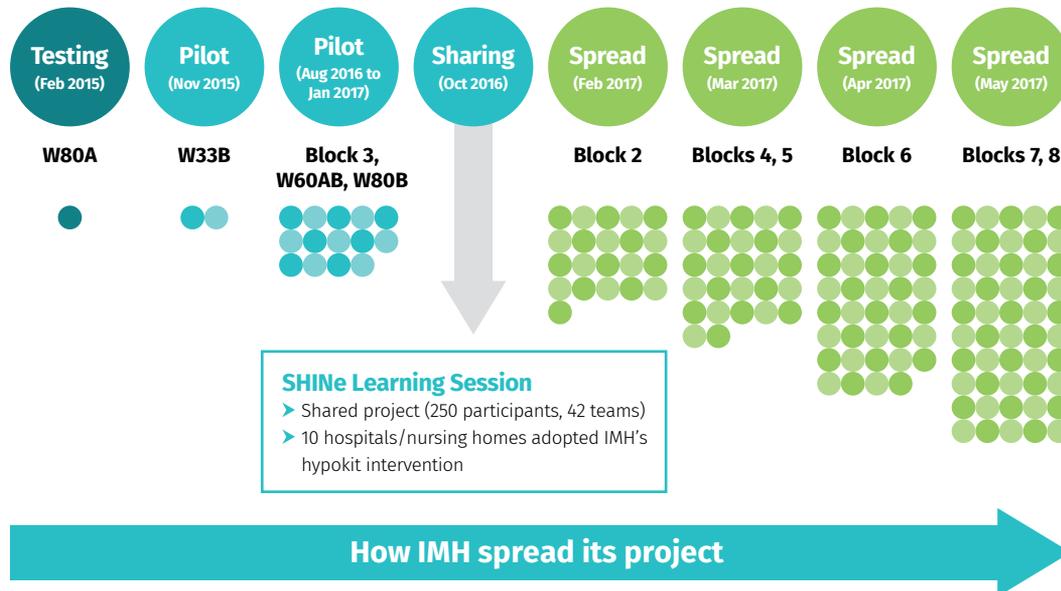
A coaching clinic has also been set up to help teams spread their projects effectively.

IMH has demonstrated how a project can be spread successfully. In 2014, it began working with the Singapore Healthcare Improvement Network (SHINe) to improve its processes for managing diabetes.

Before the improvement project began, it found that one-third of diabetic patients in IMH had experienced blood glucose levels outside of the protocol range of 4.0mmol/L to 20mmol/L, which is potentially dangerous as they may be experiencing symptomatic hyperglycaemia or hypoglycaemia.



► The project team (above) worked with SHINE in 2014 to improve the process for managing diabetes in IMH wards



► The graphic above shows how the project was spread to other wards. The project was tested in February 2015 before undergoing two pilot rounds. It was then spread to 50 wards in May 2017

A 10-member project group was formed to look into reducing these episodes and did an extensive review of literature and diabetes care policies from local and international hospitals.

Following several rounds of plan-do-study-act cycles – where the effectiveness of changes are tested on a small scale – the team came up with two key protocols that improved the management of diabetes for patients.

One was a checklist for ward staff to use upon the admission of a diabetic patient; the other was a rescue protocol to help staff manage patients whose blood glucose level fell outside of the protocol range.

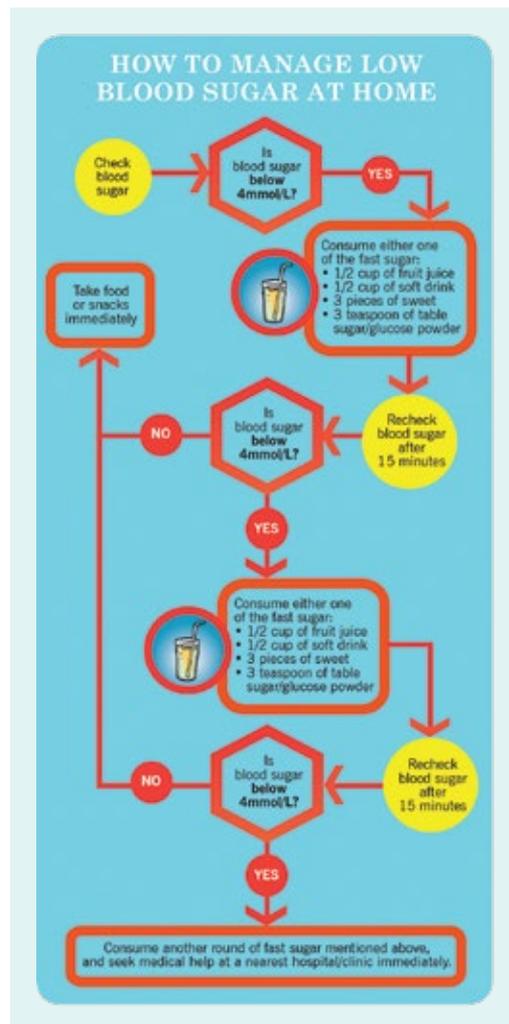
The team also tracked the number of patients who received their hypoglycaemic agent or medication 30 minutes before or after meal times, to find out which patients were not getting their meals in a timely manner and why. Research shows that patients who take their diabetic medication and meals too far apart were more likely to experience hyperglycaemia or hypoglycaemia.

With the help of KTPH dieticians, IMH nurses and F&B colleagues, the team also changed the default diabetic diet for patients from 1,500kcal to 1,800 kcal. These efforts helped the team lower the median of patients experiencing out-of-range blood glucose levels from 33.3 per cent to 16.5 per cent – a 50 per cent reduction over two years.

Starting as a pilot in one ward, the project was eventually spread to 50 wards in two years following successful results. The positive results validated the project and helped to gain buy-in from the other teams. Monthly data was sent to the wards so that staff will know if the protocols were working.

The project's programme manager Irene Lim advised other groups doing improvement work not to give up even when initial data does not show improvement and to go down to the ground to observe implementation.

"Staff on the ground can tell you a lot about your project," she said. "Their input is invaluable."



IMH Diabetes Management Protocol

WHAT SHOULD YOU KNOW?

Do you know? The SHINE Medication Safety project team tracks indicators on your use of the protocols. You can ask us about your indicators any time!

Kindly contact us for any questions & feedback:

- Irene (CGQ)
- Dr Gena & Dr Giles (GP)
- Zhenyu, Chunyan & James Hu (Nursing)
- Sze Min, Julius & Jingzhou (Pharmacy)

ROUTINE PROTOCOL
"So many things to do! What if I miss out something!"
The protocol covers everything you need to do when you receive diabetic patients into your ward!

RESCUE PROTOCOL
"Oh no! My patient's hypoglycemia readings are off the charts!"
Use this when your patients have out-of-range readings!

HYPO-KIT
"Argh.. Forgot the cup! No more water in the jug!"
No more fumbling! Attend to your hypoglycemic patients with our handy all-in-one kit!

EDUCATION BROCHURE
"Eh Nurse ah.. I don't know what you talking leh?"
Use our education brochure – complete with pictorials and easy-to-understand language!

INSTITUTE OF MENTAL HEALTH

SHINE

➤ Excerpt of an IMH patient brochure, which was given out to help patients manage low blood sugar at home

➤ A diabetes management protocol poster was pasted in wards to promote visibility of protocols

LEARNING FROM NEAR-MISSES

NHG targets to reduce preventable adverse events by 50 per cent every three years. In order to minimise preventable harm, however, we need to know the risks and gaps in the system. As such, reporting near-misses – instances where a patient is exposed to an unsafe situation but does not experience harm due to early detection or intervention – are helpful for learning.

Hospitals abroad and in Singapore have launched programmes to reward and recognise staff who report a near-miss, or a “good catch”, and voluntarily log incidents that could have harmed a patient if not for timely intervention. In 2018, NHG institutions visited Changi General Hospital to learn more about their Good Catch initiative, with plans to start its own programme the following year.

MANAGING RISKS

Enterprise Risk Management (ERM) is a process of coordinated risk management where institutions, divisions and departments cooperate to manage a full range of risks. This could involve clinical risks such as falls and errors in the documentation of medical records, as well as other risks faced by NHG such as financial and legal risks.

The NHG ERM programme started in 2010 with the development of the NHG ERM framework and policy. The NHG Board Risk Committee and institution risk sub-committees were subsequently formed to review, evaluate and make recommendations on risk management structures, processes and other matters related to risk management at the respective institutions.

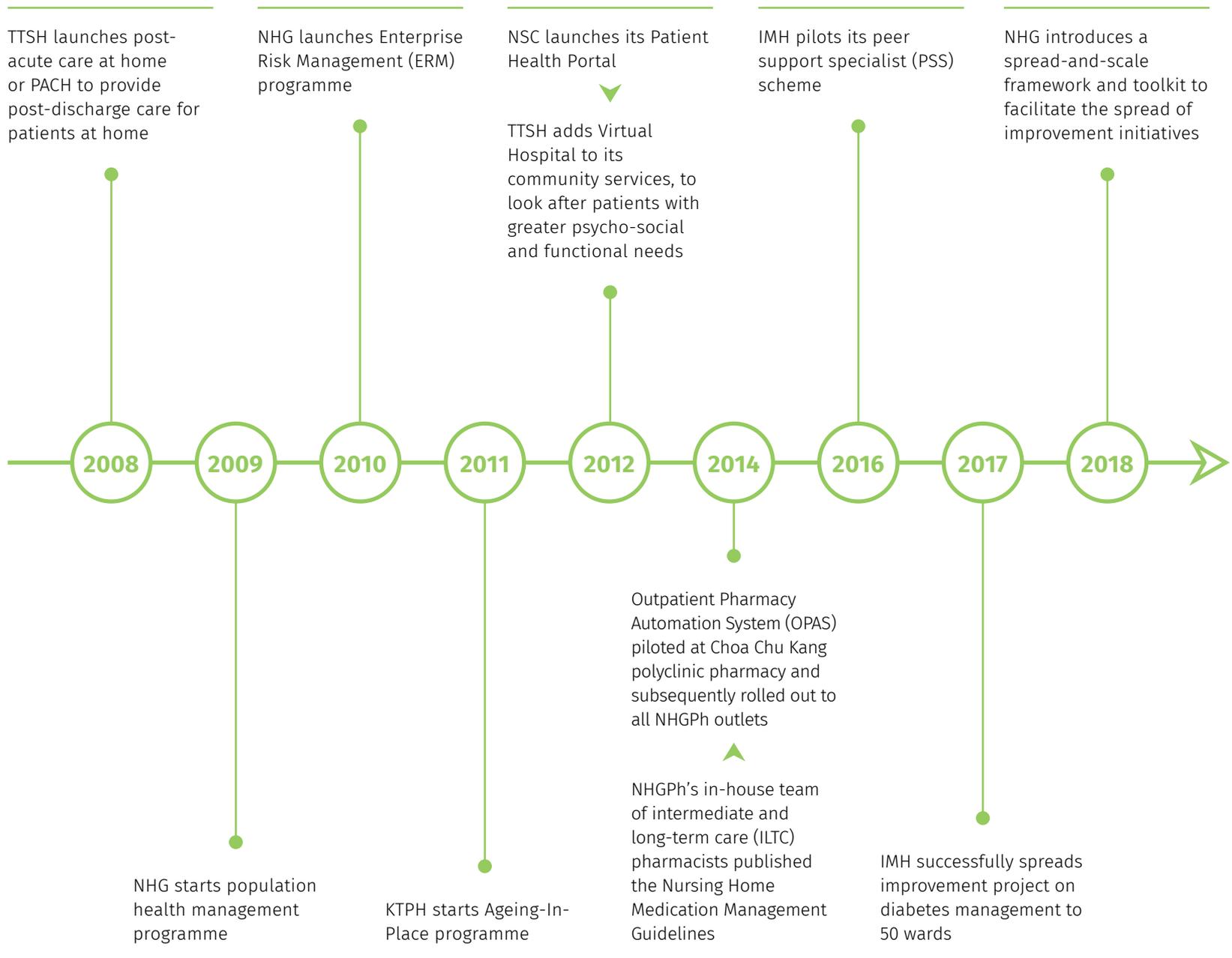
Departments across the cluster also regularly identify and analyse risks relevant to their own department. The risks are then evaluated to assess their priority and whether existing mitigating measures are adequate. This information is captured in the department’s risk register.

NHG started incorporating the Failure Modes and Effects Analysis (FMEA) tool in its training in 2007. Used to proactively evaluate processes and identify risks, the tool has been used to help institutions steer clear of recognisable pitfalls.

Institutions have used the tool before the launch of major projects, such as when NSC embarked on an overhaul of their centralised electric power system and needed to identify the risks that may disrupt their power supply. The findings were submitted to the institution’s Quality Assurance Committee.

At NHGP, FMEA was used to identify potential failures that could affect the timely triage and management of patients with acute medical conditions. The findings led to interventions being implemented at NHG polyclinics, including a standardised process for consistent hand-offs from frontline staff to nurses and doctors. They also raised the awareness for all staff – especially frontline ones – to look out for patients in distress, and to reduce the time they spend waiting to be seen by a doctor.

TIMELINE



REFLECTIONS



Dr Tan Kok Leong
Head, Continuing and
Community Care, TTSH

The potential patient safety issues related to care provision in the community and home settings are unique in many aspects. They pose a challenge to those of us who are more familiar with the care of patients in acute hospital settings, such as in emergency rooms or inpatient wards.

Drawing from what we learnt in preparation for JCI accreditation, we embarked on streamlining and standardising care processes. A few areas were particularly important, including documentation. We introduced a standard template so that key patient information, such as clinical findings, care plan and contact details of providers are clearly documented to facilitate follow-on care and review by other care providers. This minimises ambiguities and miscommunication and was crucial in the early days when the electronic platform for medical health record entry was not readily available or accessible.

When the electronic medical record system became available, we ensured that our staff had access to it and were familiar with its use. We also provided portable tablets that they could bring for home visits so they could access patients' clinical information in a timely manner. In addition, TTSH collaborated with NHGP to facilitate read-only access for physicians from both services to view the medical records, ensuring better care of patients utilising health services from both organisations.

Other important issues were medication review, infection control and falls. We work with community partners to clear clutter, rearrange furniture or modify homes to make them safer. We also put in place a work process to call or visit patients within a certain time period following their discharge. Our nurses will follow up with regular monitoring through telephonic review to identify changes in medical conditions early for timely interventions, such as adjustment or titration of medication, to avoid hospital re-admission.

While we have come a long way in building systems and training our staff in patient safety, we will continue to face numerous challenges as the demands and needs of community care evolve.

In 2016, TTSH merged a few teams that handle post-discharge care to form the Transitional Care (TC) service (later renamed Community Health Team service). This move aims to streamline care delivery and prevent duplication in care provision. The merger resulted in many people from different teams coming together, which makes communication and clarity of SOPs even more important. This will only get more complex because we will have more community partners coming on board as we expand our care team, including volunteers and befrienders.

As mentioned earlier, timely information is important. At present, only some of the community medical and nursing partners have access to the National Electronic Health Record (NEHR) to view patients' medical information. They do not have access rights to view the hospital's electronic medical records of the patients that are also under their care in the community. Without effective and timely sharing of patient information, patient care may be delayed or even compromised.

With heightened concerns surrounding cybersecurity and patient data confidentiality, the challenge facing healthcare workers with patient information is in deciding the extent to which it should be shared with care partners they are collaborating with. Such issues have to be addressed at the policy and inter-government agency levels.

With an expanding pool of community partners, we will also have to build a safety culture, enhance patient safety practice and break down silos of individual service providers, so as to ensure safe, efficient and effective care for our patients. It will take time, but it is crucial to work together to achieve it.

INSIGHTS



VOICES FROM THE GROUND



Dr Alex Su
VCMB (Clinical Quality), IMH

I first got involved in patient safety about 20 years ago when I was a medical officer. I was disturbed by the number of assaults – some quite serious – by patients towards other patients and staff in IMH.

“Why should patients get harmed when they are here for psychiatric treatment?” I thought to myself. So I told our CMB I wanted to start an assault reduction taskforce. We looked up literature and came up with simple strategies, such as identifying high-risk patients, victims and situations. This was refined after I enrolled in CPIP and we put our lessons into an assault reduction manual.

From there we went on to look at other patient safety related issues such as choking, falls, restraints, medication errors and suicides. I’ve been IMH’s PSO since 2012. I feel a good PSO should have rich clinical and ground experience, have handled complaints before and be familiar with bridging gaps.

It’s also important to remember that our staff are our resources in implementing patient safety, so we need to prevent them from being burnt out. When pushing out new initiatives we need to be aware of their workload, or we may end up adding more risk to the process. We should follow simple and well-established methodologies that they can easily understand, so they are able to own their data and improvement strategies.



Mr Christopher Ng
Assistant Director (Quality),
Allied Health division, TTSH

Patient safety is paramount and requires a multi-disciplinary team to work together to foster a strong culture of safety and continuous improvement. In 2014, the Allied Health Services and Pharmacy (AHS&P) joined the clinical division to better integrate patient’s care.

As AD Quality for the Allied Health division, I monitor and analyse trends, identify gaps and work with different departments for continuous quality improvements. Part of the work also include using a systematic approach to determine the factors that lead to an incident. It helps us to better understand the root of the problem so as to come up with the most appropriate and effective solution.

There are learning points from every incident and it is important that we learn and improve so that future incidents can be prevented. Incidents can happen anywhere and the causes can be multi-factorial. I remember an incident where a patient fell while trying to retrieve her belongings and was seriously injured. This case reminded me that environmental design is an important consideration, as the layout of the space did not integrate patient flow.

We should not take safety for granted and should constantly look out for ways to improve our patient care. In the division, we share real-life examples with staff across many platforms and work through scenarios, so that they can learn from the experience of others to avoid recurrences.



Mr Darren Lim
Assistant Director, Nursing, IMH

My work on patient safety started in 2011, when I was tasked with handling JCI accreditation and improving patient safety and quality of healthcare in the institution. Subsequently I became Deputy PSO (Dy PSO) representing nursing and started to look at patient safety in a more multi-disciplinary manner.

In my journey, I've learnt that patient safety is a team effort. For example, within nursing, we introduced the "safety nurse" concept in 2014 where a designated "safety nurse" would eyeball all the patients every hour during their duty and watch out for the high-risk behaviours. Although this concept was well-received, there were numerous lapses, including unwitnessed falls due to our higher patient-nurse ratio, and caused burn-out among the safety nurses. After doing PDSAs, we came up with interventions, one of which was to rotate the role in each shift among staff, including the supervisor.

I've also learnt that a few qualities are essential for patient safety improvement. These include:

- Communication skills to articulate ideas on improving patient safety in a non-judgmental and non-confrontational way
- A good knowledge base and understanding of patient safety theories and methods
- A data-driven mindset and understanding of basic statistical methods and formal analytic methods, so as to know what actions to prioritise to improve patient safety
- A commitment to lifelong learning



Dr Anthony Goon
Senior Consultant, NSC

I was NSC's first Patient Safety Officer (PSO) and helmed patient safety singlehandedly during my first year as PSO. I'm also the first chair of the NSC safety committee.

In our early years we achieved a lot because we had a low baseline. These include improved incident reporting rates and better safety measures in many areas, such as labs, pharmacy and clinics. Subsequently the challenge was to preserve our gains and continue improving, albeit at a slower rate.

We need to ensure the safety of patients as it would be very unfortunate if they are harmed while seeking treatment for a skin condition. Sometimes, certain problems persist despite our best efforts, but still we try to cap them at the lowest possible level.

I feel PSOs should have a keen eye on safety issues and be driven to improve safety conditions not only for patients but also staff, vendors and visitors. After some experience in the committee, most able managers and doctors can fill the role.



Dr Kenneth Low
Director, Dental Services, NHGP

The biggest challenge for patient safety is not to take it for granted. It is especially challenging to get new staff to be aware of patient safety as they may not have experienced patient safety incidents in a dental clinic setting.

A few years ago, we rolled out a series of safety lectures for our dental officer orientation. The lectures covered the identification of medical emergencies that can occur in a dental setting such as when a patient suffers from a heart attack or stroke during a procedure.

About two weeks after the lectures, a patient had a stroke in one of our clinics. The dentist was able to identify the signs of stroke very quickly, and the patient was rushed to hospital within two hours.

The patient had a good outcome and did not blame us for the stroke because it happened to be an accidental event. We may take these orientation talks for granted, but you never know how they may come in useful.



Mr Henry Kong

Senior Staff Nurse, Yishun Health

Nurses are a constant partner in a patient's journey. We attend to them and ensure a safe environment, but with the multitude of tasks we have, even the best may make mistakes in a hectic hospital environment.

A few years ago, on my first night shift as a new nurse in a ward, a patient fell from his bed as I was administering intravenous antibiotics to another patient. For a nurse, there are few scenes more nerve-wracking than seeing your patient sprawled on the floor.

We quickly helped him up and later did a CT scan and X-ray. Thankfully the results were normal and the patient's son was very understanding, noting that his father frequently had falls even before hospitalisation.

After the incident, the team reviewed what we could have done better. We realised that while we're positioned to keep our patients in sight at all times, we get too absorbed in our many tasks and are not always aware of our surroundings. The reduced visibility and manpower of night shift also increased risks.

To err is human, so it's important that we keep reminding each other to keep an eye out for our patients and to support each other when we tire.



Ms Cheryl Char

Senior Pharmacist, NHG Pharmacy

When all of us decided to join the healthcare industry, we vowed to do no harm. There have been a few personal experiences that influenced me to make medication safety a priority.

One was a chemotherapy error which happened when I was on internship. I knew the pharmacists involved so it was disheartening to see netizens blame them. The public perception is that healthcare professionals cannot make mistakes but we are humans too. As much as we aim to do no harm, slips and lapses beyond our control may happen.

Another was an incident that happened when I was a pharmacist working here. It involved a patient who was accidentally prescribed two statins – simvastatin and atorvastatin – by the doctor upon discharge. This error was also missed by the pharmacy staff.

After taking both statins, the patient ended up with increased creatine kinase and was hospitalised. Questions were asked as to why the error was not caught by pharmacy staff, but a doctor defended us to say that the pharmacy has caught many errors – this just happened to be one that slipped through. So I've learnt that safety does not rely on one person. Everyone has a role to play.



Ms Doris Liew

Director, Operations Support Services, NHGP

When I rejoined NHGP in January 2016, I was tasked to redesign link chairs for new polyclinics. There were falls involving patients who had tripped over the legs of the link chairs hence the new design should incorporate features that would minimise falls. In the process of redesigning, other parts of the chair that could potentially cause a patient to fall, such as the arm rest, were also considered.

Besides redesigning the chairs, each row of link chairs should be placed at least 50cm apart from the other so as to allow more room for patients to move out of the chair rows. The chair legs were also changed from an inverted T to an inverted V design, and stickers warning patients about the chair legs were placed behind the backrest of chairs as a reminder to be careful when getting out of the row. The inverted V legs were tucked below the seats to minimise the risk of patients tripping over the legs when moving out of the row.

Awareness of patient safety issues has grown among our staff over the years, but the challenge lies in getting them to proactively spot risks. People are so busy in their daily work that risk points become blind spots. When risk points are spotted, incidents can definitely be reduced.



Ms Ng Ying Ru
Senior Pharmacist,
Pharmacy Services Centre, NHGPh

Part of my daily work involves a weekly visit to nursing homes to review residents' pharmacotherapy management, look out for actual and potential drug related problems, and suggest how to optimise their medication regimen.

I'm also part of the team that looks after the professional practice of our team of ILTC pharmacists, so I often seek ways to improve our quality of work, be it through better training framework or clearer protocols.

In my patient safety work, complacency is the biggest challenge, despite our best intents. It's always tempting to skip a step, a question, or a check just so we can be more efficient and see the next patient sooner. It's a constant battle to remind ourselves to remain vigilant amid our fast-paced and demanding environment.

However, it's important that we do not fail our patients through preventable errors. Hence if there is anything that can be done to reduce that margin of error, I think it's always worth exploring. We should always remind ourselves that if the cheese holes align and a mistake slips through, it's the patient – the very reason that we are here for – who loses out in the end.



Ms Tan Yoke Choo
Nurse Clinician, NSC

Patient numbers at NSC's phototherapy unit have grown significantly over the years and today we handle about 250 patients daily. As team leader, my role is to ensure teamwork and dedicated coordination by my staff in caring for our patients.

In 2012, we encountered a few incidents in the clinic, where there were unsatisfactory results due to the interplay of factors including manpower constraints, equipment maintenance and gaps in processes. However, these incidents provided both learning and improvement opportunities.

In the interest of patient safety, NSC convened a multi-disciplinary workgroup that year to improve the safety of phototherapy and related processes. I took it as an opportunity to review six major areas: structure, environment, equipment/technology, processes, people and leadership/culture.

Interventions must be multi-level and multi-dimensional, with participation from different stakeholders and not just nurses alone.

Many people view skin as a non-critical organ and may feel that stringent rules to uphold patient safety are overdone and cause great inconvenience. But patients who seek help in any healthcare facility will always have three basic expectations: "Please don't hurt me"; "Please make me better"; and "Please make me comfortable."

VIEW FROM THE OUTSIDE: MR GORAN HENRIKS



Mr Goran Henriks

Chief Executive of Learning and Innovation,
Qulturum, Jonkoping County Council, Sweden

NHG's approach towards patient safety has matured greatly since I first visited them about 10 years ago. At that time, it looked more at accreditation and technical aspects such as assurance, control and efficiency.

Today, however, the focus has shifted to risk assessment. It is where you try to work upstream and minimise risk and harm to patients. Otherwise, if you just focus on the degree of mistake or harm, you will always be one step behind.

NHG has done well in its approach to develop a system which can help people to do the right thing from the start, so that targets can be hit consistently, thus reducing rework and waste. This is absolutely a move in the right direction. It shows a deeper understanding of value development and is a sign of a more mature system.

Another key improvement in NHG's system lies in the increase in accessibility, which has developed dramatically.

When I first visited 10 years ago, all hospitals and emergency departments here were overcrowded. The polyclinics had a situation where everybody felt that they had too many patients coming through every day. Today there is a much better balance between capacity and needs. This shows NHG understands the kind of collaboration it needs to improve access.

Access is probably the most important pillar in terms of patient safety. If you have good access, people develop trust in the healthcare system, and can connect better. Once there is a mistrust, people will tend to find other

channels to get support. By gaining trust, we can ensure that diseases are treated as soon as possible, and people will not venture into alternative modes of treatment which may not work as well.

At the same time, measuring results is very crucial in safety work. So, safety- and result-oriented management is very closely connected. This is one aspect which I feel Singapore has some room for improvement. A quality register is an important resource to help us understand whether the processes are meeting the needs of the system and whether there are any variations in the services. From what I observe, Singapore still needs to improve on the ability to collect and analyse data based on the different disease groups.

One possible reason for this lack of capacity could be that the computerised systems are not process-oriented, so we are not able to simply extract data from there. It also takes some standardisation of the protocols so that we know what kind of input each treatment requires.

Another area for improvement would be in strengthening the link between the knowledge and practical science. It is not about how we develop knowledge, but how well the knowledge gained can be used.

I understand that NHG is now pushing very hard for population health. I believe population health can help patient safety a lot. Self-management is the strongest way to recommend use of services. If we can increase the autonomy of patients and empower them to do it themselves, we would also minimise safety risks.

Based on my own experience in Jonkoping, when patients are in control of the process, the clinical results are always better, because the patients personally understand and supervise the process.

Another challenge that Singapore faces is in diabetes control. If you cannot successfully reach out to the population with your health aims, then risk increases, because more patients become complex cases when they get older.

When you have a complex patient with many chronic diseases, the risk of harming the patient through wrong medication increases dramatically. So, inspiring and involving patients in their own health is very important in patient safety.

The bright spot is that the younger population in Singapore appears to be much more activated. When they grow up, it may then be easier to handle patient safety. However, by then the world might face a new set of challenges, and new diseases might hit our population.

Globally, we are presented with many exciting opportunities. I will name three things happening now that could have a big effect on patient safety work in future.

First, AI and digitalisation will make it more possible for us in future to understand and reduce diagnostic errors, in areas where our system do not recognise. I think that kind of knowledge will develop a completely new work pattern among many specialists.

Second, the shift of concept from “where it does not work” to “where it works”. In the future, I think patient safety will move into the areas of understanding how and why it works so well, even though not all the coordinators are in place.

Third, the involvement of patients, and individualisation of patients and our understanding of segmentation will help reduce error and increase safety in our work significantly.

The possibilities have developed so much now, such that we can now turn cancer into a chronic disease, and understand more about genetic injuries in the bodies.

This rapid development also increases the complexity of the care service, because opportunities in individualisation also present challenges. Therefore we will really need a different kind of attitude and work pattern in healthcare today – awareness of what works and what doesn't work today, and how we as a team can contribute.

While striving for continuous improvement, we should also bear in mind the importance of building a resilient workforce. Always keep the purpose in mind and our energy up, to understand that we are here for someone else. When we feel so imprisoned in our own methods and dealings, always remember that it is the love and engagement in people which brings real quality to our daily work.

VIEW FROM THE INSIDE: ADJ. A/PROF TAI HWEI YEE



Adj. A/Prof Tai Hwei Yee
Group Chief Quality Officer, NHG

I recall the day when I was asked by Prof Philip Choo to take on quality and patient safety. It was just after TTSH had settled back to some degree of normalcy following the SARS outbreak in June 2003. I was then dealing with the post-SARS provisions for ICU, and was feeling a sense of relief that we were returning to usual operations.

Philip showed me the Adverse Event Study results that had been conducted by NHG. He told me: “I have a new job for you. This adverse event rate is unacceptable. I need you to halve this rate in three years.”

I was stunned for a moment, but soon the facts sank in. I said: “Tell me more. How can we achieve this?” Philip then went on to elaborate that the hospital was changing the structure and composition of the Medical Board, and was creating a post of Vice-Chairman of Clinical Quality and Audit. He wanted me to take on this portfolio to ensure TTSH had a system of monitoring and clinical audit, and systems to continually improve safety and care for patients. Subsequently we revised the timeline of halving the AE rate to five years.

Within a short period of time, a strategic plan was presented to the TTSH Medical Board. The plan encompassed four main areas of work:

- a. Creating a strong patient safety culture – encouraging openness and transparency, as well as a systems approach to addressing errors, and implementing a non-punitive approach for staff

- b. Improving knowledge and skills for patient safety and quality improvement concepts at all levels of the hospital through hospital-wide training and engaging clinical champions across the organisation
- c. Improving internal processes by identifying errors and risks, analysing errors, improving care, and ensuring that there was a strong accountability and governance system to implement solutions
- d. Creating a collaborative learning system, so that TTSH could accelerate speed of adoption of changes through active learning from international agencies and experts, as well as from our sister institutions in NHG and other local institutions

Over the next year, a strong community of practice was established at the NHG level, as patient safety officers (PSOs) and quality directors gathered to formulate strategies, and collaborate on cross-institutional activities and joint initiatives. It was really gratifying to be part of such an energised and passionate group of clinicians, and firm and long-lasting relationships were forged in those early days.

I particularly want to highlight two areas where I think NHG has done well. One is in the area of training and equipping clinicians and clinical teams on the ground. As a group, the PSOs were able to come together to agree on the common concepts and key areas of patient safety training, and we were able to quickly incorporate this training for our junior clinicians and nursing staff. This was an important strategy as safety at front-line processes is a vital component of patient safety.

Management was also very supportive when we decided that Quality Improvement (QI) training for clinicians was a necessity. The relentless drive to equip our clinicians at all levels with patient safety and QI knowledge and skills also changed culture, and created a new language in our clinical workforce.

The second area is in terms of addressing change at a system level. Over the years, NHG has been able to take the IHI Breakthrough Series collaborative improvement model to make significant changes in our systems and improve patient safety.

The commitment by our NHG organisations to each of the five collaboratives that we have conducted is testament to the resolve of our senior leaders and clinicians to address patient safety and improve clinical outcomes. Significant resource investments were put into the implementation of electronic order entry, driving laboratory automation and adopting Joint Commission International accreditation standards. These have fundamentally changed how we work. Other system-wide areas of change include open communications with patients after a safety incident, and how we create support systems for staff.

Despite all the progress, however, I still think there is a lot to do. The complex environment around us continues to evolve. Although there have been good attempts to proactively identify and address risks in the past, I think the need to do so is more urgent and pressing today and in the near future.

New models and systems are introduced at a pace which creates safety concerns. There is a need for healthcare staff, management and system owners to fully internalise and understand principles of risk management. We also have a wonderful opportunity to engage patients, families and the community on the topic of safety in a bigger way as we move towards population health and shift care into the community. This will give us much better insights and a deeper understanding of how patients interact with their care processes.

Measurement systems also have to change to keep up with new processes, risks and hazards. Our indicators need to act as early warning signs to help us anticipate new potential failures. The future of patient safety, I believe, is to create system resiliency. This resiliency can help us prevent failures as much as possible, by anticipating and detecting what could fail, and mitigating in a timely manner.

With the new generation of patient safety leaders having grown up with an early appreciation of systems thinking and the benefit of QI training in their formative educational years, I'm confident that we will be able to continue addressing and building safer systems and processes in the future.

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