

## Project Title

The Home Ventilation and Respiratory Support Service (HVRSS)

## Project Lead and Members

- Dr Chan Yeow, Programme Director, HVRSS; Senior Consultant, Department of Anaesthesiology, Intensive Care, and Pain Medicine (AIP)
- Dr Adrian Tan, Deputy Director, HVRSS; Consultant, Department of Community and Continuing Care (CCC)
- Dr Looi Lai Mun, Deputy Director, HVRSS; Consultant, Department of Respiratory and Critical Care Medicine (RCCM)
- Ms Sun Tao, Nurse Clinician, HVRSS
- Ms Anura Tamar, Manager, Respiratory Therapy

## Organisation(s) Involved

Tan Tock Seng Hospital

## Project Period

Start date: Oct 2011

## Lessons Learnt

As the project is predicated on continuous improvement, the team continues to learn from their own data.

One of the earlier lessons that was derived was the fact that VAI patients with high spinal cord injury could improve beyond what was expected. Previously, such patients had tracheostomy tubes inserted, and remained ventilated on these until demise.

We discovered that the predictions of other researchers were true – that VAI patients with high spinal cord injury could improve over months, and that we could stabilize them on only secretion management, without a tracheostomy, by 6 months.

We also learnt that the clinical decline in amyotrophic lateral sclerosis (ALS) is fairly step-wise, with varying tempos, and that there was a need to call in different aspects of care to catch the changing states of the VAI.

Overall, by doing small controlled PDSA (plan-do-study-act) cycles, we could preserve the quality of care and quality of life of our patients.

### **Project Category**

Clinical Improvement, Care Redesign, Process Redesign, Workforce Redesign

### **Keywords**

Care & Process Redesign, Workforce Redesign, Quality Improvement, Patient-Centered care, Tan Tock Seng Hospital, Home Ventilation and Respiratory Support Services, Home Ventilation, Ventilator-assisted Individuals, Intensive Care Unit, Multidisciplinary Workgroup, Preventive Care, Care Continuity, Streamline Home Care, Caregiver Empowerment, Caregiver Education, Psycho-social Support, Enabling Independence, Joint Care Approach

### **Name and Email of Project Contact Person(s)**

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# ENTRY FORM FOR CUSTOMER SERVICE CATEGORY

A customer service project that responded well to the needs of its clientele, drew praise from them, and positively projected the hospital as a quality service provider. The judges favor entries that also reduced costs, and did not require major capital expenditure. More weight is given to projects that are innovative (in relation to where the hospital is located). Is it a meaningful improvement of its service considering the environment in which it operates?

## **INSTRUCTIONS**

- a. Please fill out all the sections below and abide strictly by the word count. Words exceeding the maximum word count will be cut off automatically/truncated.
  - b. **IMPORTANT:** It is necessary that the CEO certifies that all information you provide is true and correct by signing the form indicated in the last page.
  - c. By submitting an entry, you agree that HMA will share relevant aspects of the Entry submitted on the HMA or related Resource Center website.

## **Background Information**

Project Title The Home Ventilation and Respiratory Support Service (HVRSS)

Date Project Started 1<sup>st</sup> October 2011

**Enhancements made (for projects that did not start operations between January 2012 to May 2013)**

- Creation of new vertically-integrated Ventilation and Respiratory Support nurse clinician (NC) role
  - Novel experimental engagement model for ventilatory care by Family/General Practitioners
  - Inaugural outpatient clinic for primary assessment, management and patient education for ventilatory care
  - Successful organization and conclusion of the 1st South East Asian Non-Invasive Ventilation Symposium (1st SEA NIVS)

## **Key staff involved in the project**

1. Name Dr Chan Yeow

Department/Function Programme Director, HVRSS; Senior Consultant, Department of Anaesthesiology, Intensive Care, and Pain Medicine (AIP)

2. Name Dr Adrian Tan

Department/Function Deputy Director, HVRSS; Consultant, Department of Community and Continuing Care (CCC)

|                     |   |
|---------------------|---|
| 3. Name             | Dr Looi Lai Mun   |
| Department/Function | Deputy Director, HVRSS; Consultant, Department of Respiratory and Critical Care Medicine (RCCM) |
| 4. Name             | Ms Sun Tao  |
| Department/Function | Nurse Clinician, HVRSS  |
| 5. Name             | Ms Anura Tamar  |
| Department/Function | Manager, Respiratory Therapy  |

**PLEASE ANSWER THE FOLLOWING QUESTIONS USING THE MAXIMUM WORD ALLOCATIONS INDICATED**

1. Please give some background to the project or program including how it originated. Give details of how the project responded to the needs of patients and drew praise from them. Outline any specific goals or targets you had in mind prior to the project being put together. **MAX 350 WORDS.**

There are patients who outlive the necessity for ICU care, other than their need for mechanical ventilatory support to assist/ replace spontaneous breathing. In Singapore, there are no specialist respiratory care facilities to help with their care in the intermediate or long term, except in an acute care hospital.

Ventilator-assisted Individuals (VAIs) need  $\geq$  four hours of mechanical ventilation per day. Many families dare not care for their loved ones at home because of the costs and risks - high cost of ventilation equipment, the lack of knowledge/ skills or full-time support to attend to the 24/7 respiratory needs of VAI, the lack of funds to care for the VAI over a longer term, etc.

VAIs have little choice except to remain in hospitals, predisposing them to poorer outcomes given the more infectious nature of hospitals, and taxing the public healthcare system further than necessary.

In 2009, TTSH formed a multidisciplinary workgroup to improve the quality of life for VAIs. They studied progressive healthcare systems and visited Royal Brompton Hospital (London) and L'Hôpital de la Pitié-Salpêtrière (Paris). They implemented many activities to see what work best for VAIs. In 2011, a 5-year funding proposal was put up successfully to Ministry of Health.

TTSH's Home Ventilation and Respiratory Support Service (HVRSS) creates a comprehensive, coordinated and preventive care system for VAIs:

- **Care continuity:** Bridge transitions (ICU to home)
- **Streamlining of care at home:** Home clinical support, with telephone advice, and care coordination
- **Preventive; early intervention:** Intercept progression of clinical complications, avoiding emergency hospital attendances
- **Education; psycho-social support:** Caregiver education, medical social worker support
- **Sharing knowledge and skills:** With other healthcare teams
- **Referral service within TTSH:** Extended to patients with short to medium-term ventilatory needs
- **Outpatient respiratory consultation:** To identify patients at risk of becoming VAIs. Pro-active management, with focused respiratory care.

More than 65 patients have benefitted with the longest survivors doing well four years after discharge. These VAIs spend more time with their families. We have made it a little more possible and safer to help them look after themselves at home.

Word count: 349 / 350

2. Please describe how the project was beneficial from the patient's perspective and experience, and how it improved patient care, patient safety or service. Preferably please present quantifiable information such as "before and after" measurements if any. Did it meet and exceed expectations? **MAX 200 WORDS.**

Prolonged hospitalized is a form of institutionalization, almost like imprisonment. There is not much that patients can do. With HVRSS, however, we have made inroads:

- Proved that willing, able laypersons can competently care for VAIs.
- Changed perception from helpless ICU-bound victims to pro-active patients with wishes, needs and abilities.
- Enabled independence in VAIs: One found employment, one coached his daughter for examinations.
- Established MI:E as a safe non-invasive method of protecting VAIs from lung complications.
- Brought in international experts to spread knowledge/skills. Included VAIs/families in conferences for meaningful dialogue.
- Ignited a joint care approach for VAIs, regardless which hospital they were admitted to.

Comparing a VAI before HVRSS, and a HVRSS case, the HVRSS case stayed well for longer, conferring a QoL previously unattainable.

|  | <b>Pre-HVRSS case<br/>(2004 – 2005)</b> | <b>Early HVRSS VAI<br/>(2008 – 2012)</b> |
|--|---|--|
| Age  | 50                                      | 51                                       |
| Discharge destination                                    | Private nursing home                    | Own home                                 |
| Ratio of [Total days lived] :<br>[Days outside hospital] | 7 : 1                                   | 5 : 3                                    |

It is hence no wonder that 100% of VAIs surveyed said that in a second chance, they would have chosen the same again. On average, VAIs felt satisfied, with meaning in their lives.

Word count: 197 / 200

3. Please tell us how you have engaged your whole team in a culture of customer service excellence and how the project positively projected the hospital as a quality service provider. **MAX 200 WORDS.**

This programme addresses the many concerns of families who wish to bring their VAI loved ones back home to care. They feel more confident and assured with the training, the constant support, the hotline and the regular monitoring. Many a times, the families have shared their gratefulness for the wonders that this project has made possible for them and their loved ones, making lives more meaningful and precious.

The team members organized themselves around competencies. There emerged a new paradigm of “role” as defined by the needs of the patient, in which some traditionally medical roles were shared by nurses and therapists, and vice versa.

These changes are intertwined with the development of a novel nurse clinician track, which equipped the nurse with a skill-mix that stretched from ICU care to community care in the VAIs’ home.

Because of the long term view, our relationships with VAIs are trusting and collaborative. Goals are set with VAIs, and progress is measured with them.

Despite living in housing estates all over Singapore, VAIs sometimes choose to travel long distances to reach the HVRSS for this care.

Word count: 184 / 200

4. Please explain if the project utilized capital and how much was utilized. Or in fact did it also reduce costs? To what extent was the project prevention oriented, and how well it will reduce or eliminate the service defect, or reduce waste, or improve communication. Will the benefits be long lasting? **MAX 150 WORDS.**

HVRSS has succeeded in decreasing unnecessary clinic visits over 2 years, from average 14/year to 6/year. To substitute, we used only 4 home visits per patient annually.

Changes in healthcare usage (Jan 2011 – Dec 2012):

|   | <b>2011</b> | <b>No. per VAI</b> | <b>2012</b> | <b>No. per VAI</b> |
|---|-------------|--------------------|-------------|--------------------|
| No. of ED attendances                       | 71          | 2                  | 92          | 2                  |
| No. of hospital admissions                  | 10          | 0                  | 19          | 0                  |
| No. of clinic visits for specialist/NC care | 423         | 14                 | 343         | 6                  |
| No. of clinic visits for tracheostomy care  | 10          | 0                  | 52          | 1                  |
| No. of physio- and occupational therapy     | 60          | 2                  | 126         | 2                  |
| No. of home visits for medical/nursing      | 22          | 1                  | 223         | 4                  |
| No. of day surgery procedures               | 8           | 0                  | 3           | 0                  |

The cost for HVRSS is between SGD41 and SGD50 daily per VAI, versus the daily cost of a general ward. However, the team also realizes that VAI families bear heavy monthly expenditures amounting to approximately SGD3,500 on average.

Word count: 147 / 150

5. Please give some background of the project team that originated, studied and developed the project or program. **MAX 200 WORDS.**

The team includes representation by:

- AIP – Dr Chan Yeow
- RCCM – Dr Looi Lai Mun
- CCC – Dr Adrian Tan
- Nursing Service – Ms Sun Tao
- Respiratory Therapy – Ms Anura Tamar
- Physiotherapy – Mr Lawrence Xu
- Occupational Therapy – Ms Chia Pei Fen
- Care & Counselling – Ms Lee Ming Li and Ms Janet Chua
- Operations – Dr Liew Li Lian and Ms Koh Qiaoli

With this diversity came domain expertise in multiple areas.

Dr Chan Yeow was the Director of the Surgical ICU, Dr Looi was a consultant of the Medical ICU and an interventional pulmonologist, and Dr Tan had served in community hospital positions and in family practice prior to joining TTSH.

Ms Sun Tao, who had served in both private and public hospitals, also had broad ICU and general care experience. Ms Tamar had, prior to her healthcare life,

worked in manufacturing industries. Mr Xu and Ms Chia between them carried more than 10 years of therapy experience. Both Ms Lee and Ms Chua were dynamic working mothers who were compassionate dedicated MSWs. Ms Koh was a science graduate who understood systems processes and Dr Liew was a trained doctor who had entered Operations work.

Word count: 200 / 200

6. Please give any other information, including third party testimonial regarding your project which you think would help convince the judges that this project (or program) should win this category. **MAX 200 WORDS.**

A touching SMS from a grateful young VAI:

*"Today is my 1st day of audible speech....I could talk for hours. I even read a story to my daughter."*

Word count: 28 / 200

# THE POWER OF ACCEPTANCE: PROFILE OF GOH BEE HONG, A VENTILATOR-DEPENDENT PATIENT

**S**ince the age of two, Goh Bee Hong, 51, has suffered from *Poliomyelitis*, a viral disease that affects nerves, leading to partial or total paralysis. Her illness rendered her paraplegic and wheelchair-bound. Although she comes from a family of eight, support has been limited and she has lived in disabled homes for most of her life. Despite these circumstances, Bee Hong focused her energies on maintaining her autonomy, managing self-care, retaining mobility via an electric wheelchair, completing her education up to Primary Four and also gaining financial independence as a Bizlink clerk for many years. She shared that she wanted to prove to her mother that her disability did not make her a "useless" person.

## Onset of devastating illness and its impact

In July 2010, Bee Hong suffered a restrictive lung disease brought on by her medical condition and was in a critical state when admitted to Tan Tock Seng Hospital. While her medical condition eventually stabilised, this acute episode left her oxygen-dependent and in need of nocturnal non-invasive ventilation. In addition, she had also declined functionally and could no longer manage care for herself as before.

Devastated by her loss of independence and ability to work, she was even more distressed when she realised that she could no longer live in Singapore Cheshire Home, a place she had called home for 33 years, because of her increased needs. Her sense of rejection was also deepened when she found out that



voluntary nursing homes do not accept patients who are ventilator-dependent.

## Finding a home again

During her hospitalisation, Bee Hong had been referred to the hospital's Home Ventilation Service (HVS), a multidisciplinary team that supports patients who partially or fully rely on mechanical ventilators. After consultation with Bee Hong, it was decided that an appeal would be made through AIC to explore her placement in a nursing home, with the HVS team supporting her care through equipment provision, training and collaboration with the nursing home staff.

Bee Hong was referred to Ling Kwang Home for Senior Citizens for consideration. Belina Tham, Nursing Director at the Home, shared that there were initial

reservations about taking in Bee Hong as they had never before taken care of a ventilator-dependent patient. However, recognising that Bee Hong needed their care, Dennis Tan, Chief Executive Officer, and Belina decided to rise to the challenge.

To facilitate Bee Hong's transition, the respiratory therapist from HVS conducted training sessions, covering ventilator management principles for the Home's nurses. As Bee Hong had learnt the management of her ventilator well, she was also able to guide the nurses.

### Ongoing support from HVS

Besides specific input pertaining to Bee Hong's respiratory care needs, the medical social worker (MSW) from HVS also visits her monthly to provide ongoing psychosocial support as she adapts to her new environment. The MSW also provides feedback to the Home's care staff to help identify and address her unique needs as a disabled person living in a facility meant primarily for the elderly sick. In response to a need for greater independence, the Home has allowed Bee Hong to go on her own to a church next door. She is also given more time to manage her self-care, helping her maintain her sense of dignity.

The Home's nurses are also assured that they can call upon the HVS team for assistance in Bee Hong's care. Together, they are developing more in-depth training for staff to better manage ventilator-dependent patients.

### The power of acceptance and support

Four months on, Bee Hong has built good relationships with the Home's staff and residents and participates in activities within the Home that has enriched her life. These include befriending elderly residents, helping foreign nurses with Chinese dialect translations and also couriering items within the Home. The nurses joke that she is their "nursing home postal service". She also helps feed the fraailer patients, waters the plants in the garden and makes suggestions on ways to improve the general quality of life for residents. Bee Hong shared that she has renewed meaning in life and is grateful to her combined team of carers for their assistance. Not only has she now a new home, she also has a bigger extended family. ■

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# A breath of hope

As Singapore ages, more patients will need to be cared for beyond the hospital walls, whether at home or in the community. Here's how one acute hospital is gearing up for this sea-change in healthcare

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We are sitting by a small garden, peaceful save for the sounds of a television from the nursing home's recreation room. Sitting back in her wheelchair, Goh Bee Hong, 51, talks gladly about how she helps water the plants, befriends the elderly residents and nips over to the church next door for two hours a day to do what she does best — make herself useful, with small administrative tasks.

"Ever since I started going there to work, I feel much happier. You know, if not, I would be almost on the edge of giving up," she said.

Had this been four years ago, her semi-independence would have been impossible; likely, she would have been confined indefinitely to a hospital bed. It would have been a fate worse than death for Bee Hong, who has fought her whole life for her independence.

At age two, a high fever had left her debilitated by Poliomyelitis, a viral disease that leads to partial or total paralysis. Her family was not well-off and, with five younger children to care for, found it tough to cope. She has spent nearly 50 years in and out of different hospitals and homes for the disabled.

She couldn't stand the humiliation of people seeing her as useless. "It hurt me a lot, so I had it in my mind to prove to them that I'm not good for nothing," said Bee Hong, who went on to complete her Primary 4 education despite constantly falling ill, and supported herself by working as a clerk at Bizlink for over 20 years. In her motorised wheelchair, she enjoyed hanging out at shopping malls.

Then, in July last year, Bee Hong's lungs collapsed. She fell into a coma at Tan Tock Seng Hospital (TTSH). The doctors treating her told her family to prepare for the worst. "She had chronic asthma, respiratory failure and curved spine from Polio, and pneumonia as well. It was a triple whammy," said Professor John Abisegnanaden, Bee Hong's respiratory doctor.

But she fought, and lived.

Her recovery in hospital took six long months. Initially, Bee Hong's medical and palliative care doctors told her she would have to be permanently oxygen-dependent and use a Bi-level Positive Airway Pressure (BiPAP) mask.

"I just couldn't accept it. I kept crying



Nurses from Tan Tock Seng Hospital fussing over Goh Bee Hong. PHOTO BY SYAFIQAH HAMID

to God and telling him that I didn't want to live on the BiPAP machine — I would rather not go on," she said, crying as she recounted her story.

Three months after being admitted, with physiotherapy, Bee Hong got out of bed and back into her wheelchair. "I wanted to be well again. I wanted to go back to the home I was living in. So I worked very hard."

But then came the next blow. Medical social workers regretfully told her that her former home could not take her in, now that she was ventilator-dependant. Nor could other nursing homes. "I felt so broken hearted. I had been there for 33 years, I grew up there," she said tearfully.

Then senior medical social worker Karen Kwa introduced her to the hospital's Home Ventilation Service (HVS) — a team that supports patients living outside the hospital who rely on mechanical ventilators. Karen also wrote to the Agency for Integrated Care under the Ministry of Health; it approached the Ling Kwang Home for Senior Citizens to see if they would help. And they did.

The home's director, Ms Belina Tham, said: "When I read her story, I didn't know her but I said, 'why not we try'."

The hospital's Community Charity Fund provided Bee Hong with a \$S15,000 portable ventilator. Respiratory doctors under the HVS trained Ling Kwang's nurses in how to put on her BiPAP mask each night. Karen and the doctors continue to drop in on Bee Hong once a month, to give her emotional support and check on her rehabilitation.

### HEALTH CARE NO LONGER STRAIGHTFORWARD

These days, Bee Hong, whose expenses at the home are being covered by Medifund, is finding new hope and semi-independence in life again. She is one of a growing number of patients being helped through rehabilitation home care after being discharged from hospital.

One in five Singaporeans will be over 65 years old by 2030. This demographic trend has immense implications for healthcare. The buzzword these days is step-down care — improving and finding more ways of caring for people once they have left the hospital.

"The reality is that the acute hospital model, where you discharge your patient assuming that they can look after themselves, is no longer the best fit," said Associate Professor Chin Jing Jih, divisional chairman of integrative and community care at TTSH, which handles the largest catchment of elderly patients in Singapore.

In the past, with a younger population,

healthcare was "very straightforward", he said. "People get sick, they come to the hospital, they get their problems solved, they go back home, recuperate for a few days, they go back to work. So in the past, I think the Government has rightly invested a lot in the acute hospitals, and developed the expertise there."

"But as lifespan increases, the part of a person's life when they are frail is also increasing. So you find that a lot of hospital users are now frail old people. And frail old people do not recuperate like the young. They recuperate in phases. Some need extra rehabilitation and help in nursing care."

"Out of the hospital, their needs are no longer met. If you don't handle that well, and if they are frail, they fall sick again and they come back here again."

This awareness that acute hospitals need to change their strategy has led to initiatives like TTSH's Continuing and Community Care (CCC) team, set up in November 2008. It comprises volunteers — doctors and nurses across all the medical disciplines who chip in their time, unpaid.

They offer their expertise and training to step-down care partners such as nursing homes, and to the patients' families and caregivers — for instance, teaching the family maid how to change a dressing. The team also makes house calls — patients are regularly visited by doctors, medical social workers or therapists, who make sure their needs are being met. Currently, they make about 13 home visits a day.

A medical social worker, for instance, would check on how the patient is doing emotionally and financially. Sometimes they go beyond the call of duty — for instance, helping to obtain a mobile phone and SIM card for a patient's mother who was so poor she didn't have a phone in the house to call the hospital with.

The Home Ventilation Service was piloted in 2009 under the CCC to help those specifically with respiratory ventilation conditions. HVS is now working with the Health Ministry to see how they can expand the team and help more patients.

Dr Chan Yeow, director of HVS, said the plan is to recruit younger doctors, nurses and therapists to the cause.

"Because this kind of care is so new, we hope to learn from experts in the field. Some of us have done study trips overseas and next year, we are organising a scientific meeting."

He added: "We hope that people will realise that being in need of a breathing machine does not mean it's the end of the world. Our first goal is to get them home safely. And subsequently, like in Europe and America, some ventilation-dependent patients may be able to go back to work."



Bee Hong chatting with a resident from Ling Kwang Nursing Home.  
PHOTO BY SYAFIQAH HAMID

*The reality is that the acute hospital model, where you discharge your patient assuming that they can look after themselves, is no longer the best fit.*

Associate Professor Chin Jing Jih, divisional chairman of integrative and community care at Tan Tock Seng Hospital

## TTSH fund helps thousands

SET up in 1995, Tan Tock Seng Hospital's Community Charity Fund raises money for the underprivileged sick to be cared for in the hospital and in the community.

More than 2,000 patients benefit each year, with financial support for their medical treatment, homecare services, mobility aids and caregiver training, among other things — so

that they can regain some measure of independence and improve their quality of life.

To raise funds, the TTSH Charity Ride 2011 will be held this Friday and Saturday. More than 200 cyclists will ride from Malacca to Singapore. For information, the public can call 6357-2491 or go to [www.ttsh.com.sg/community-charity-fund](http://www.ttsh.com.sg/community-charity-fund).