

## **Project Title**

Improve Accuracy of Visual Acuity (VA) Assessments Conducted in Emergency  
Department (ED)

## **Project Lead and Members**

Project lead: Kamala Velu (ED CM),

Project members: Lim Siew Lian (ED), Nurhaslindah Yahya (ED CM), Charlene Lim (ED CM), Tan Cai Feng (ED), Lee Xiao Yun (ED), Nithya Yovan(ED), Thiynihya Sathis(ED), Nuramirah(ED), Nurul Huda (ED), Ng Kai Xin (EMD Ops), Ng Yan Jun (QII), Jason Kwan (Optometry), Madeleine Than (Optometry), Daniel Bin Bohan(NUH Optometry), Dr. Colin Ong (ED)

## **Organisation(s) Involved**

Ng Teng Fong General Hospital

## **Healthcare Family Group(s) Involved in this Project**

Nursing, Medical

## **Applicable Specialty or Discipline**

Emergency Medicine, Optometry

## **Project Period**

Start date: December 2021

Completed date: December 2023

## **Aims**

The team aims to improve the accuracy rate of conducting VA assessment as well as knowledge on practice in ED to at least 80% for all ED nursing staff by December 2023.

## **Background**

See poster appended/ below

## **Methods**

See poster appended/ below

## **Results**

See poster appended/ below

## **Lessons Learnt**

Adopting train-the-trainer technique in teaching and allowing trained staff to be involved in subsequent audits give staff opportunities to practice and reinforce assessment techniques and help build their confidence in performing VA assessments. The effective use of technology allows efficient dissemination of training videos and materials and compilation of survey results.

## **Conclusion**

See poster appended/ below

## **Project Category**

Care & Process Redesign

Quality Improvement, Job Effectiveness

## **Keywords**

Accuracy, Visual Acuity, Assessment, Emergency Department

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# IMPROVE ACCURACY OF VISUAL ACUITY (VA) ASSESSMENTS CONDUCTED IN EMERGENCY DEPARTMENT (ED)

- ✓ SAFETY
- ✓ QUALITY
- PATIENT EXPERIENCE
- PRODUCTIVITY
- COST

## MEMBERS:

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## Define Problem, Set Aim

### Problem/Opportunity for Improvement

Visual Acuity (VA) is measured for patients in the Emergency Department (ED) to evaluate their vision functions which is essential to determine and expedite appropriate referrals to Eye specialists. A survey<sup>1</sup> was conducted on ED nursing staff (Staff Nurses, Enrolled nurses, PCAs & BCAs) in December 2021 to assess their level of competency on conducting VA assessment in ED.

106 nursing staff attempted the survey<sup>1</sup> questions which focuses on 2 categories – Ability to perform VA accurately and knowledge on the practice in ED. The average score on performing VA accurately is only at **27.8%** while knowledge on practice in ED is at **42.9%**. At such, there is an urgent need<sup>2&3</sup> to improve and ensure that VA assessment is conducted accurately within ED.

### Aim

The team aims to improve the accuracy rate of conducting VA assessment as well as knowledge on practice in ED to at least 80% for all ED nursing staff by December 2023.

## Establish Measures

Survey<sup>1</sup> questions were drafted to assess ED staff on 2 categories:

- Ability to perform VA accurately (e.g. *When do you use the pinhole when performing VA Assessment?*)
- Knowledge on practice in ED (e.g. *What is the testing distance (in metres) of the Snellen Chart used in ED/EDTU?*)

Results of the survey<sup>1</sup> as follows:

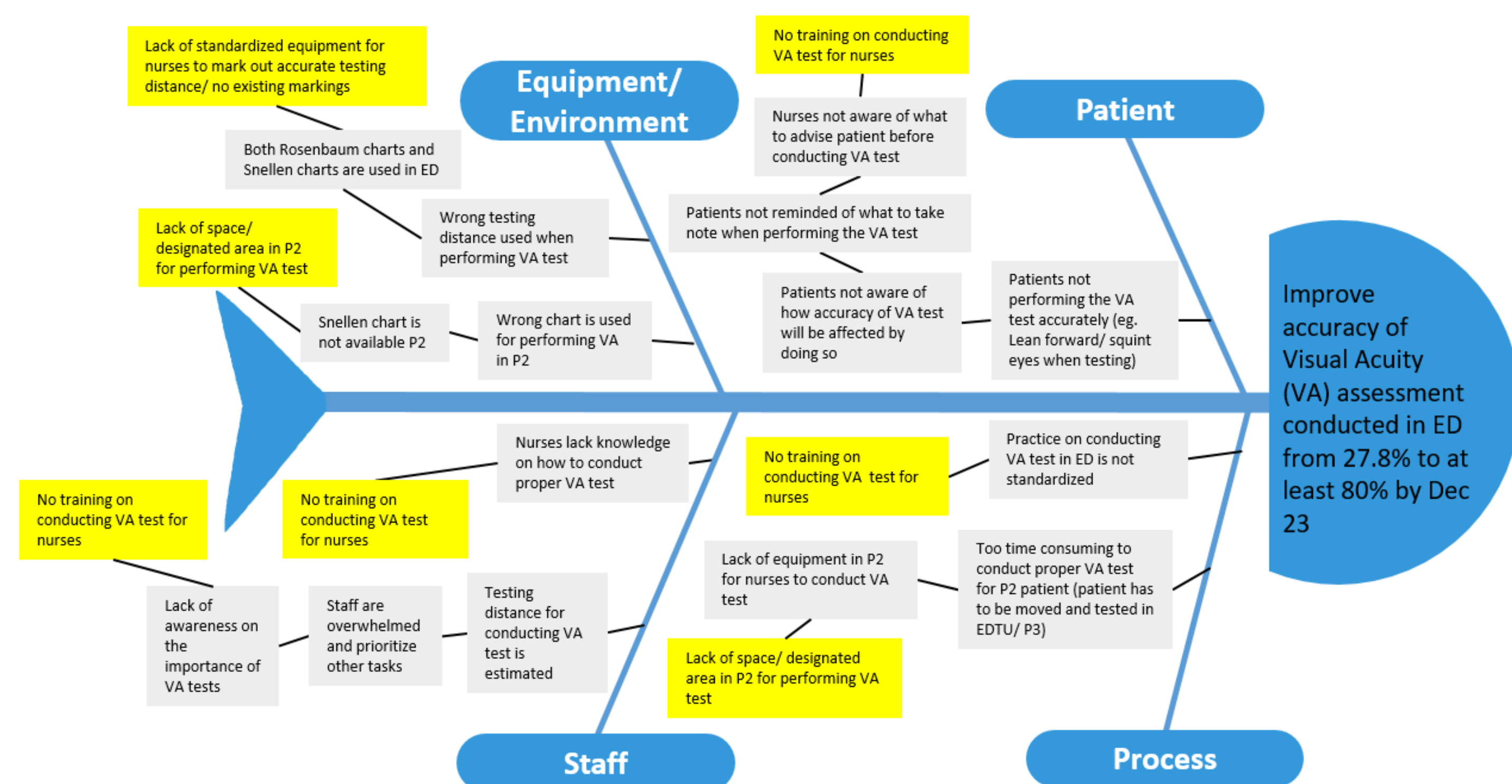
Category	Average Score
Performing VA accurately	<b>27.8%</b>
Knowledge on practice in ED	<b>42.9%</b>

The survey<sup>1</sup> questions will be repeated post intervention to determine the effectiveness of our interventions.

## Analyse Problem

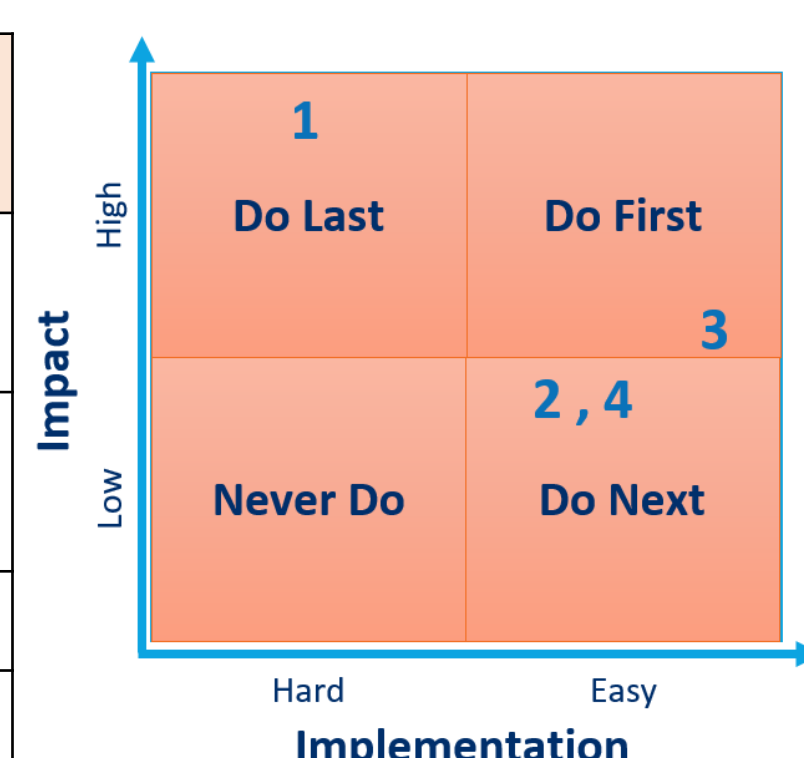
Our team analysed the root cause using the fish bone diagram and 3 root causes were identified.

- Lack of training on conducting VA assessment for nurses
- Lack of space/ designated area in P2 for performing VA assessment
- Lack of equipment for nurses to mark out accurate testing distance/ no existing markings



Solutions to resolve the root causes were ranked and implemented according to the Impact vs Implementation matrix.

S/N	Potential solutions	Root cause
1	Conduct training and competency assessment for all ED Nurses	1
2	Sharing of video guide on importance of performing VA assessment accurately and how to perform VA	1
3	Procure equipment to facilitate VA assessment	3
4	Facilitate VA assessment in P2 using portable stands	2



## Spread Changes, Learning Points

### What are/were the strategies to spread change after implementation?

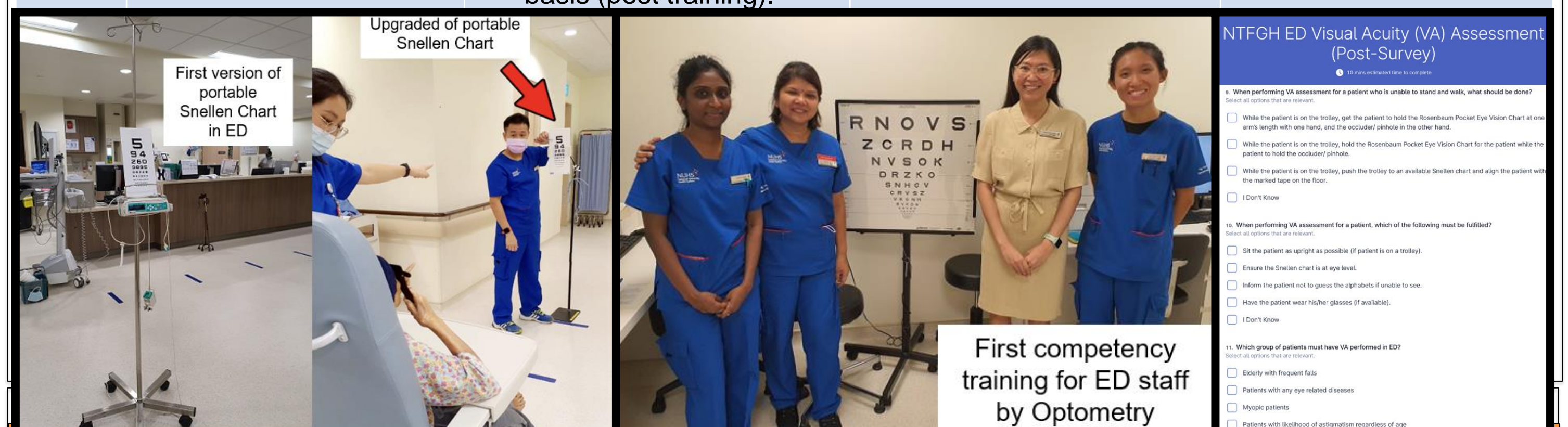
- With the support from nursing leaders, the competency assessment will also be included in ED Nurses' foundation training moving forward. This will ensure that all new hires will be trained.
- Clinical instructors in ED will be trained and be involved in training of all other ED nurses with GEM champions and ED Case Managers. All ED nurses are scheduled and expected to be trained by December 2023.

### What are the key learnings from this project?

- Adopting train-the trainers technique in teaching and allowing trained staff to be involved in subsequent audits give staff opportunities to practice and reinforce assessment techniques and help build their confidence in performing VA assessments.
- Effective use of technology allows efficient dissemination of training videos and materials and compilation of survey results.

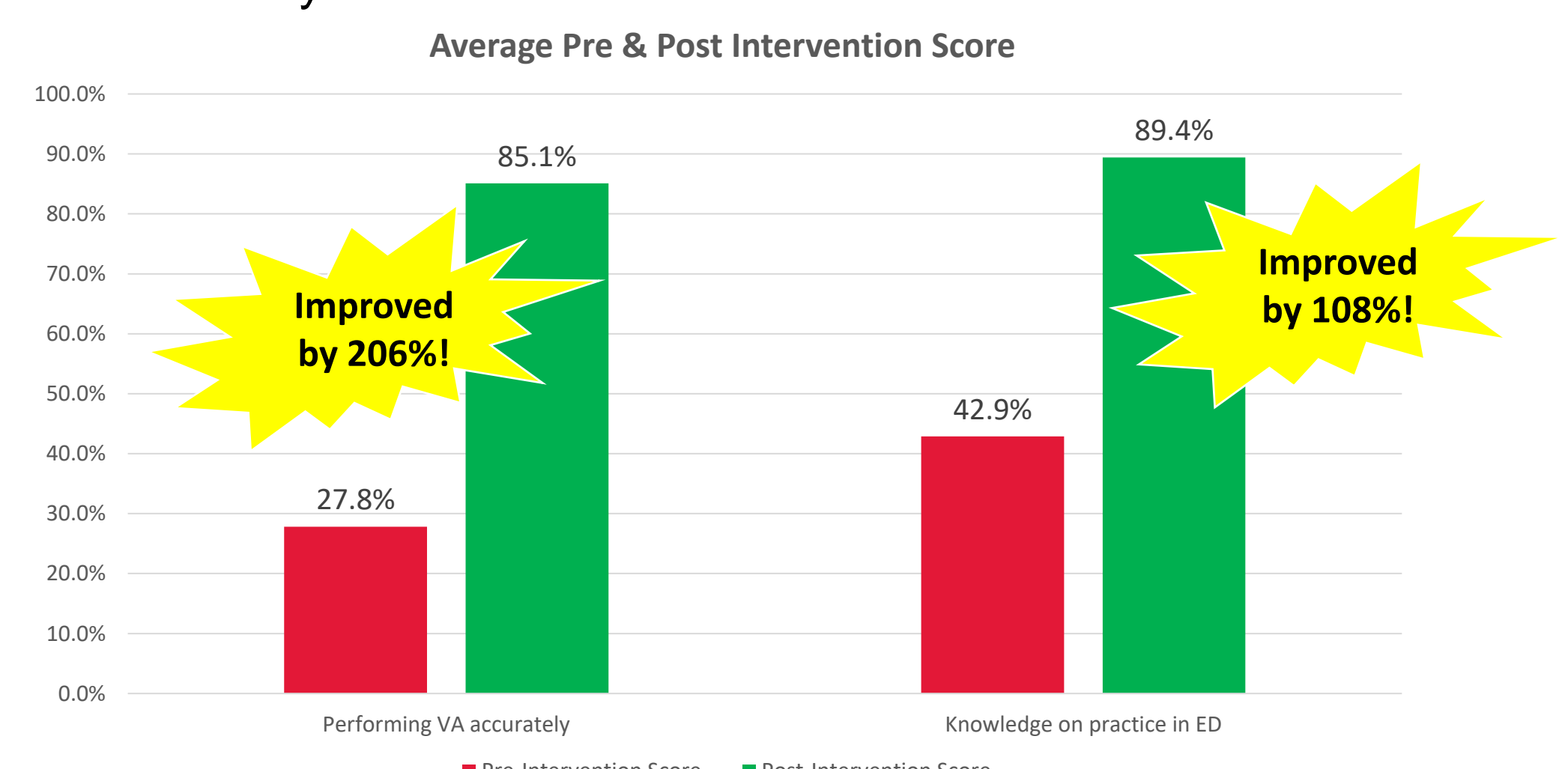
## Test & Implement Changes

CYCLE	PLAN	DO	STUDY	ACT										
1	Procurement of equipment required to perform and facilitate VA assessment in ED.	<ol style="list-style-type: none"> <li>The team made rounds in ED &amp; EDTU and to determine where the new Snellen charts should be placed.</li> <li>New Snellen Charts and occluders were procured and made available in EDTU &amp; ED.</li> <li>3-metre testing distance was measured and marked in EDTU &amp; P3.</li> </ol>	Feedback were collected after implementation and nurses agreed that this has shortened the time required to conduct and accurate VA assessment.	<b>ADOPT</b> The set up is adopted in ED P3 & EDTU. This will also be referenced to when setting up P2.										
2	Perform random audit on ED staff to gain insights on the errors frequently committed by staff.  Staff that were often involved in conducting VA assessments for patients were audited.	Random audit was conducted on ED staff between December 2022 and January 2023.  Staff were told to simulate actual VA assessment conducted for patients including documentation of their findings and highlight if referral to eye specialist is required.	23 ED staff were audited and the errors were classified into 4 categories: <table border="1"> <thead> <tr> <th>Category of error</th> <th>No. of staff that committed the error when audited</th> </tr> </thead> <tbody> <tr> <td>Documentation</td> <td>12</td> </tr> <tr> <td>Equipment</td> <td>4</td> </tr> <tr> <td>Distance</td> <td>12</td> </tr> <tr> <td>Method</td> <td>10</td> </tr> </tbody> </table>	Category of error	No. of staff that committed the error when audited	Documentation	12	Equipment	4	Distance	12	Method	10	<b>ADOPT</b> With the audit findings, the team engaged the Optometry department for suitable training and video guides for ED staff to address these errors.
Category of error	No. of staff that committed the error when audited													
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3	The team intend to develop training materials on VA to address the issues identified during the audit as well as develop ED specific competency checklist to ensure that ED nursing staff are competent in conducting an accurate VA assessment.	The team engaged Optometry department from both NUH and NTFGH for advice and sharing of existing training guides and relevant materials.	The team went through the materials and found that the visual acuity assessment conducted by SOC are very detailed and relatively time consuming which could be difficult to be implemented in the ED setting.	<b>ADAPT</b> With reference to the materials shared by Optometry, the team co-developed a new set of training material and competency checklist specific for use in ED.										
4	The team brain stormed on ways to facilitate VA assessment in P2, bearing in mind the space restrictions and rapid movements in ED.  It was agreed that having a portable Snellen chart would best suit the P2 setting.	Snellen chart was tied to an existing drip stand (first version) in ED and tested in EDTU & P2 for 1 month.  This portable Snellen Chart is deployed to P2 when required and kept in EDTU when not needed which solves the issue on space constraints in P2.	Following feedback were gathered from staff: <ol style="list-style-type: none"> <li>Risk of damaging the pumps when deploying the chart</li> <li>Chart can be unstable on the drip stand</li> <li>Drip stand has a broad base and not easy to maneuver</li> <li>Limited drip stands available in ED</li> </ol>	<b>ADAPT</b> Instead of using the drip stands, portable tablet stands were purchased for Snellen charts to be clipped on. 3-meter string is also attached to allow nurses to measure testing distance quickly and accurately.  These stands are light and the height of the Snellen chart can also be easily adjusted.										
5	Ensure sustainability and knowledge retention through on-going training and audits performed by ED Nursing staff.	<ol style="list-style-type: none"> <li>5 staff were trained in person by Optometry and all have passed the competency assessment.</li> <li>The training was presented to ED ADON and approved to be included in Nurses' foundation training to ensure all new hires will be trained.</li> <li>VA audit template is made available online for subsequent audits will be conducted by trained nurses on a bi-monthly basis (post training).</li> </ol>	Train-the-trainer method will be adopted to train all other ED nurses.  Feedback has been received from the staff that the video is comprehensive and easy to understand.	<b>ADOPT</b> All ED nurses will be scheduled for the competency and training in batches (target to complete by Dec 23).  Training videos will also be shared via ELEARN.										



## Outcome

Post-intervention survey was conducted in August 2023 and significant improvement is achieved. Our target to improve accuracy of visual assessment conducted in ED is also met before the target date.



	Pre-Intervention	Post-Intervention
No. of ED Nursing staff that attempted the survey	106	104

### Reference:

- Full set of survey questions: <https://form.gov.sg/64ccc2b90b8c940012e889b7>
- Haupt, P. S. (2008). Visual acuity testing in the emergency department: Education and competency for emergency nurses. *Clinical Notebook*, 34(3), 233-235.
- Horton, J. C. & Jones, M. R. (1997). Warning on inaccurate Rosenbaum cards for testing near vision. *Surv Ophthalmol*, 42(2), 169-174.