

## **Project Title**

Improve Nurses' Confidence and Performance During Medical Emergency (Code Blue)

## **Project Lead and Members**

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- Teo Lee Hwa
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## **Organisation(s) Involved**

National Heart Centre Singapore

## **Aims**

This project aims to improve nurses' preparedness and coordination skills to save lives in an event of medical emergency.

## **Background**

See poster appended / below

## **Methods**

See poster appended / below

## **Results**

See poster appended / below

## **Conclusion**

See poster appended / below

## **Additional Information**

Singapore Healthcare Management (SHM) Conference 2021 – Merit Award  
(Operations Category)

## **Project Category**

Healthcare Training & Education

## **Keywords**

Healthcare Training & Education, Performance Management, Simulated Training,  
Manpower Saving, Cost Saving, Safe Care, Nursing, Healthcare Administration,  
National Heart Centre Singapore, Operations, Medical Emergency, Code Blue, Life-  
Saving Skills

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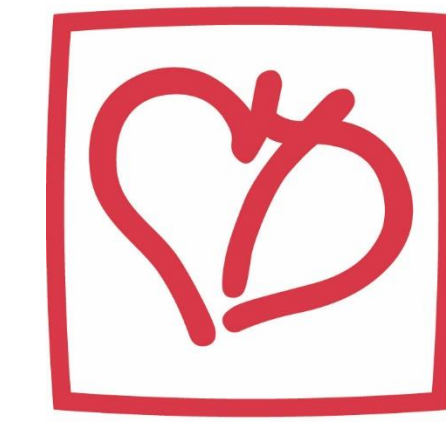
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## Singapore Healthcare Management 2021

Lim Choon Chai, Huang Na, Nor Syamsul Nazly Bin Mohamed Said, Sim Guan Hua Jonathan, Teo Lee Hwa, Sun Xia, Sivaranjini Siva



National Heart Centre Singapore  
SingHealth

### BACKGROUND

Life-saving skills and knowledge from life support courses for nurses are acquired through classroom trainings. However, as emergency activations in general ward are infrequent, these skills deteriorate at a fast rate - merely 6 months after completion of training. Nevertheless, it is essential to retain these life-saving skills and knowledge to ensure preparedness in an event of medical emergency.

Based on past events, doctors feedbacked that there is room for improvement in nurses' preparedness and performance during an emergency activation. Nurses also voiced out that they lacked the confidence in responding to such emergencies. This project aims to improve nurses' preparedness and coordination skills to save lives in an event of medical emergency.

### TARGET

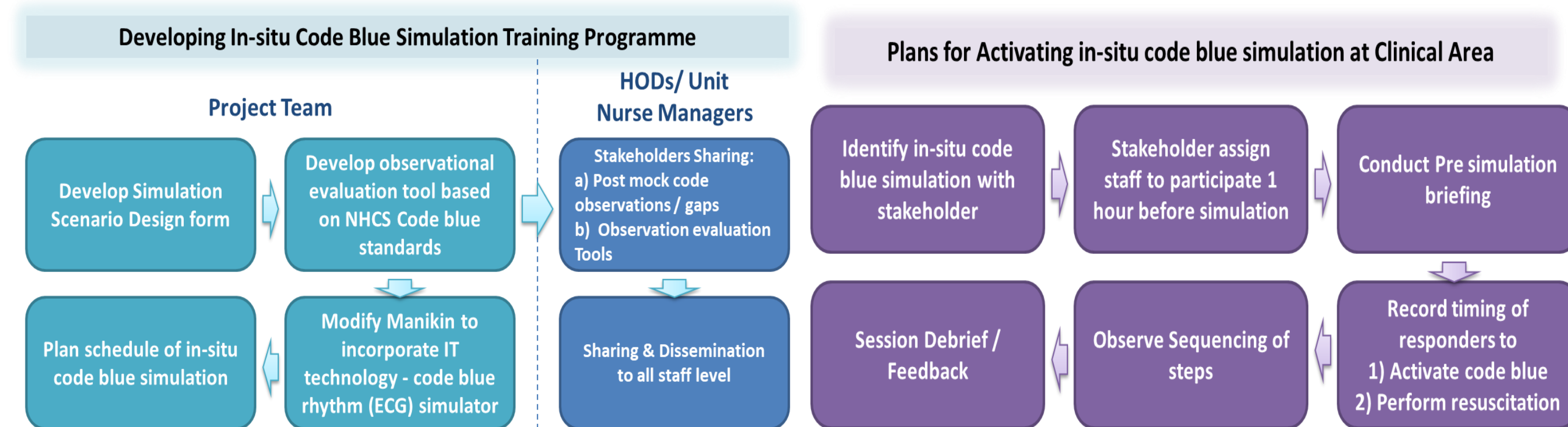


To improve coordination skills for completion of emergency response task within **10 minutes**



To increase staffs' confidence in responding to medical emergency situations from **51%** to **90%**

### SOLUTION IMPLEMENTATION



#### In-situ simulated Code Blue Training Programme (Clinical Environment)

- Interactive and scenario based training catered to staff learning needs
- Leverage on IT technologies to simulate code blue
- Simulator equipment will simulate ECG rhythm at the clinical setting

#### Simulation With Different Scenarios



#### First Responder Team



#### Standardization in code blue process

- By using an observational evaluation tool based on NHCS Code Blue standard to evaluate staff performance
- Simulated training is instructor led
- Instructor will offer critique and coaching during post session de-brief

#### Code Blue Simulation Training Observation Form

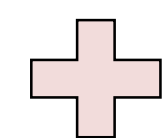
The Code Blue Simulation Training Observation / Critique Form

Ward \_\_\_\_\_ Facilitator (s) \_\_\_\_\_ Assessor \_\_\_\_\_

Date \_\_\_\_\_ Time start \_\_\_\_\_ Time end \_\_\_\_\_ Observer(s) Name \_\_\_\_\_

Start stopwatch when manikin becomes unresponsive. Indicate the performance of the following actions. Offer critique and coaching during post session de-brief. Offer prompts only if staff unable to progress. When finished, check & verify and equipment to unit location.

S/N	Concern	Gaps to enhance
1	Team work	Collaborate with each others on the task, switch roles
2	Communication	To strengthen between members, to voice out when not familiar with task and switch role
3	Equipment	Competency of equipment-need not connect ECG cables from LP 15 to patient, quick combo pad able to pick up ECG Not familiar with equipment-unable to set up suction apparatus, choose wrong wall outlet
4	Skills	DRSABC to follow the sequence—did not check responsiveness Chest compressor tiredness—ideally change every 2 minutes Interruption of compression—stoppage of chest compression is too long Incorrect mask cupping and no head tilt chin lift when bag & mask, did not look for rise and fall of chest wall Delay in initial DC shock after applying the quick combo pad ECG machine to remove from the scene to make space
5	Leadership	Leadership—need to be assertive and delegation of tasks by various members of the team
6	Parameters	Need to aware of parameters—did not take parameters initially when c/o chest pain



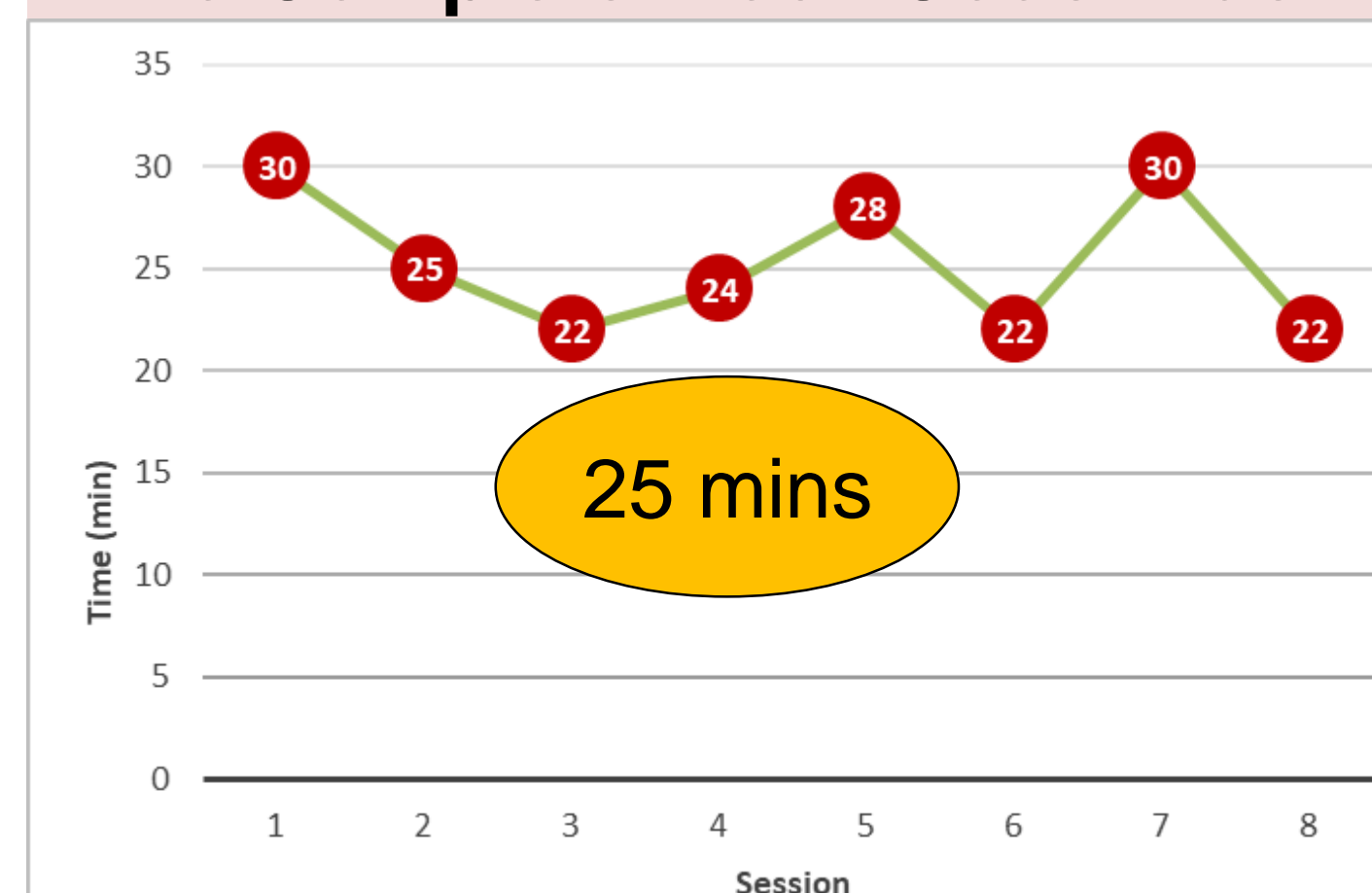
#### Instructor Observations & Feedback

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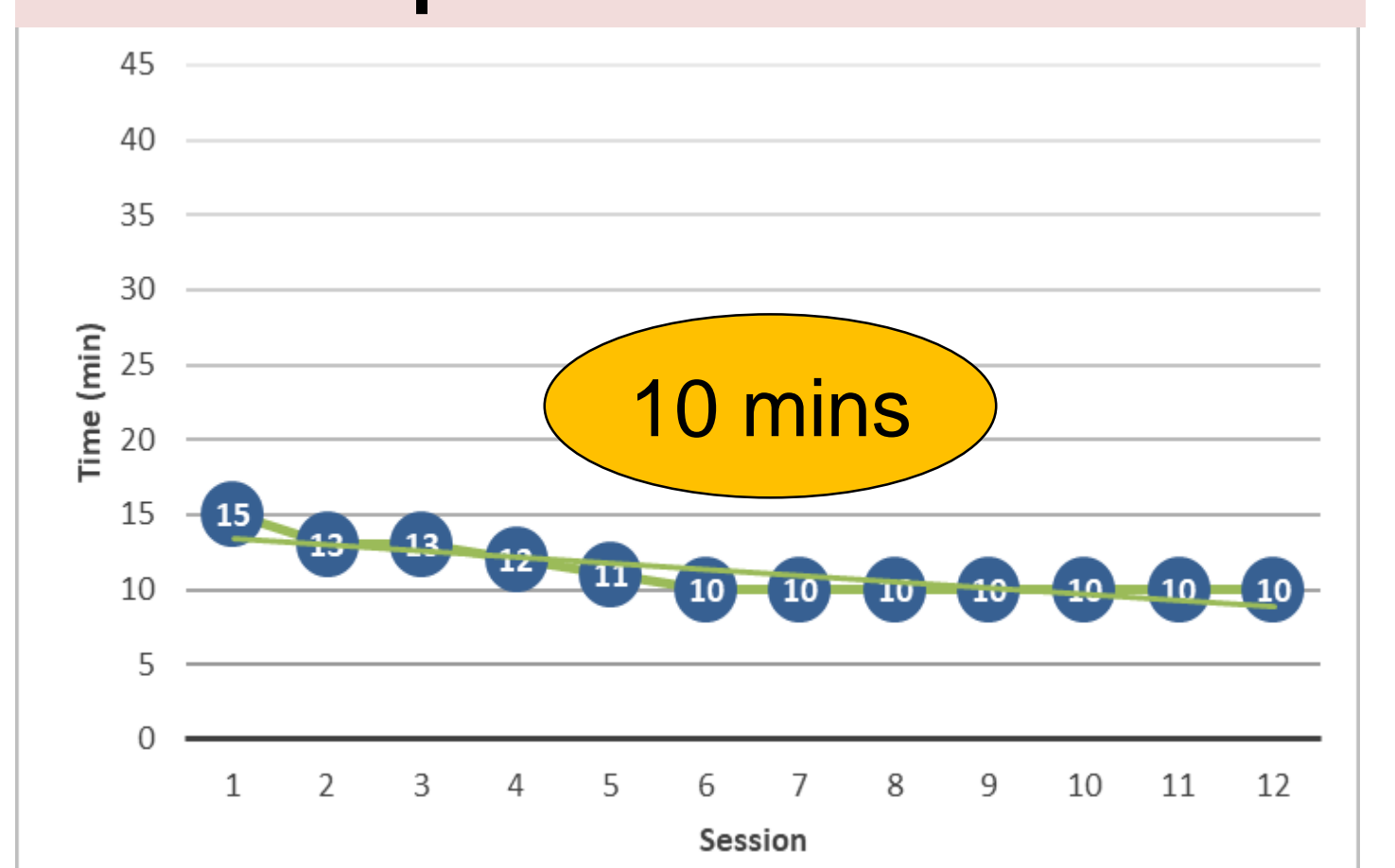
### RESULTS

#### Tangible Benefits

##### Pre-Implementation: Time Taken to Complete Mock Code Blue



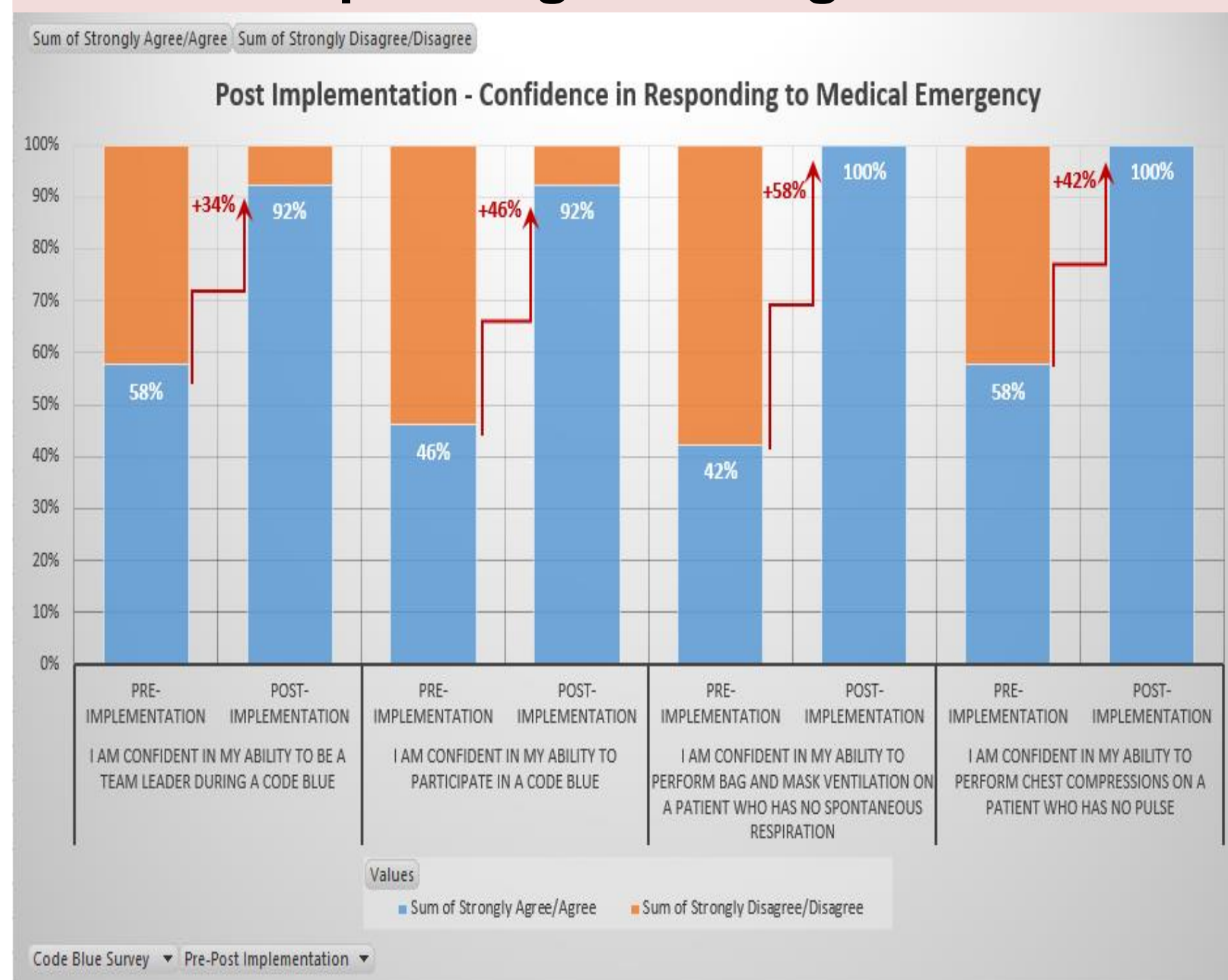
##### Post-Implementation: Time Taken to Complete Mock Code Blue



**Average of 15 minutes faster for each Code Blue Activation!**

- Staff are more organised and confident in responding to emergency situation
- Identifiable leadership and clear communication of roles

#### Increase in Nurses Confidence Level when Responding to Emergencies



Post Code Blue Survey Questions:	Strongly disagree	Disagree	Strongly agree	Agree
I am confident in my ability to perform chest compressions on a patient who has no pulse	0	0	20	6
I am confident in my ability to perform bag and mask ventilation on a patient who has no spontaneous respiration	0	0	21	5
I am confident in my ability to participate in a code blue	0	2	21	3
I am confident in my ability to be a team leader during a code blue	0	2	18	6
<b>Total number</b>	<b>0(0%)</b>	<b>4(4%)</b>	<b>80(77%)</b>	<b>20(19%)</b>

Results obtained from a post Code Blue survey revealed:

- 100%** Confidence in Skills & Knowledge
- 92%** felt confident in leading or participating in Code Blue

Overall confidence in responding to medical emergencies increased from **51% to 96%**

Staff Involved / Activation	Cost / Activation (Pre-teaching)	Cost / Activation (Post-teaching)
SSN	\$45	\$18
SN		
EN		
Total cost based on 109 activations/year	\$4095	\$1962

An average of **109** code blue activation per year

Estimated manpower savings: **82hrs/annum**

Estimated cost savings: **\$2943/annum**

#### Pre-Implementation: Resuscitation Process & Efforts

- Based on *compression data* downloaded from Code Blue simulation:
- Not enough compression depth
  - Chest compression stops intermittently
  - Inconsistent chest compressions
  - 100% achieved quality chest compression
  - 100% achieved independence in step of Resuscitation Process

#### Intangible Benefits

- Safe Learning**: Staffs are comfortable with asking questions and learning from their mistakes without experiencing any repercussions
- Realistic Learning**: Hands-on practice with equipment and clear guidelines at the actual environment is practical and leads to better efficiency in handling medical emergencies
- Enhanced Team work**: Shared responsibility in responding to medical emergencies will improve coordination and boost staffs' morale
- Patient Experience**: More holistic patient care can help to improve patients' health outcome

**CONCLUSION** There is lesser hesitation during Code Blue with clear defined roles. Identifiable leadership and clear communication of roles are key factors to good performance in resuscitation. With the implementation of these Mock Codes, providers of all levels will be able to familiarize themselves with the clear guidelines and ensure they are following the necessary steps to safe patients' lives.