

F4.2: A Rapid Response to Incident Involving CXR Interpretation by Interns Utilizing E-Learning Model

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Introduction



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Adverse incident: Misinterpretation of Chest X-ray (CXR) after Nasogastric (NG) tube insertion. Feeding was commenced on an incorrectly placed NG tube.



October 2024

Similar incident occurred at another hospital.
Both cases received significant media attention.



Rapid Response

Incident handling would require immediate action to enhance knowledge and skills for interns for interpreting CXR





Objectives



Multi-disciplinary Collaboration

Foster rapid incident response through effective team coordination.



Patient Safety

Prevent recurrence of similar incidents.



Skill Enhancement

Improve CXR interpretation abilities after NG tube placement.



E-Learning Development

Create comprehensive training module for interns.

Methodology

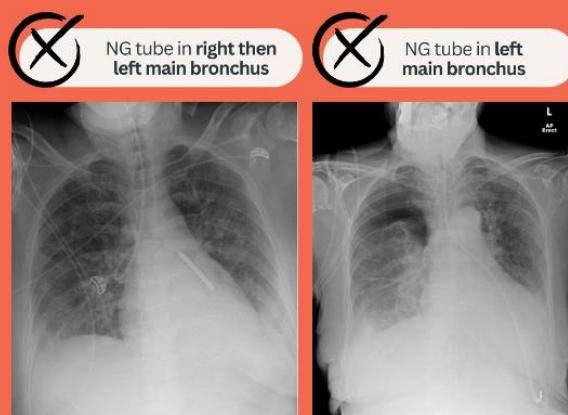
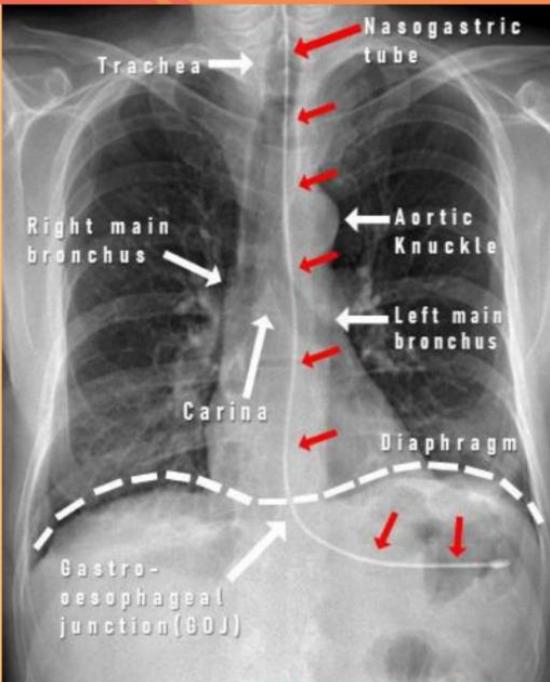
1. Immediate staff communication

Simple interpretation guide distributed to all staff via email.

Reference to NHS model (with assistance from cluster Q&S units)

6 criteria: Nasogastric (NG) tube - X ray interpretation

- 1 Is the **field of view** of the X-ray adequate? (From upper oesophagus down to below diaphragm)
- 2 Does the tube clearly **bisect the carina or the bronchi**?
- 3 Is the tube **not coiled anywhere** in the chest?
- 4 Does it **cross the diaphragm in the midline**?
- 5 Is the tip clearly **visible and below the left hemi-diaphragm**?
- 6 Is the tip **10cm beyond the GOJ**? (so that is likely to be within the stomach)



The tube run a oblique course on the right, and the tip is above the diaphragm

The tube run a oblique course on the left, and the tip is above the diaphragm

Feeding via the NG tube should NOT be initiated unless the doctor is **completely confident** in the tube's correct placement and all 6 criteria are fully met.

In case of **doubt** or special situations (e.g. in certain surgical cases), interns should seek seniors' advice.

Refresher e-training & mandatory Competency Assessment for NGT CXR interpretation:

A pass in mandatory Competency Assessment allows interns to independently interpret NGT CXRs; otherwise, a countersign from a resident or higher-ranking staff is required.

2. System Improvement

Modified Clinical Management System Investigation Ordering Module

Supported by COC Radiology

Added specific "NG tube" view option for CXR requests.

Reduced perceptual errors in interpretation.

The screenshot shows a software interface for ordering CXR (Chest X-ray) requests. At the top, there is a navigation bar with tabs: Head and Neck, Spine, Thorax, Abdomen, Pelvis, Upper Limbs, Lower Limbs, and Others. The Thorax tab is selected. Below the tabs, there are dropdown menus for 'Side' (set to 'Chest') and 'View' (set to 'PA'). A red circle highlights the 'Chest' selection in the 'Side' dropdown. A red arrow points from this circle to a sub-menu window titled 'Chest' that is displayed below the main interface. This sub-menu contains fields for 'Side' (Left, Right, Both), 'View' (AP Sitting, AP Supine, Apico-Lordotic, Energy Subtraction, Expiratory, For Nasogastric Tube Position), 'Contrast' (Yes, No), and 'Site'. The 'For Nasogastric Tube Position' option is highlighted with a red box. A red callout box with the text 'The new option: "For Nasogastric Tube Position"' is positioned to the left of the sub-menu window.

a) New "view" options in GCRS CXR orders

The screenshot shows a 'X-RAY Request Form' in a Radiology Information System. The form includes patient information: Hospital No.: HN240012481, I.D. No.: Q1470465, Name: CHEESE, BURGER, Sex: E, Age: 63y, Chinese Name: , Ward: 5K, Bed: , Tel: , Request No.: VHOR240014509T. The 'X-RAY Request Form' section contains fields for COVID-19 PCR / RAT Positive Result Within Recent 14 Days, Latest COVID-19 Rapid Antigen Test Result, Drug Allergy, eHRSS Allergy, Registration on, Examination Room, Clinical Information, Diagnosis, and Expected Exam. Date. A red arrow points to the 'Examination Requested' field, which contains the text 'Chest, For Nasogastric Tube Position'. The word 'XRAY' is printed vertically on the right side of the form.

b) Display in Radiology Information System (RIS)

3. E-Learning Module Development

QUIZ

Q6

The NG tube is in correct position

Collaborative Development

Joint effort with Human Resources (Staff Development & Communication team) and Medical Grade Unit HAHO.

Content Creation

Learning videos and case studies from Adverse incidents reporting system (AIRS) reports, local Q&S units and radiology units.

Assessment Design

Ten true-or-false questions about CXR positioning after NG tube insertion.

Follow-up Protocol

- Those unable to attain 100% score are required to repeat the test in second round at 1 week later
- Repeated failure would require counselling and direct supervision under intern supervisors to complete the test



Result & Outcomes

529

Total Interns

Working in Hospital Authority during assessment period.

96.4%

Success Rate

Attained 100% marks in first or second assessment.

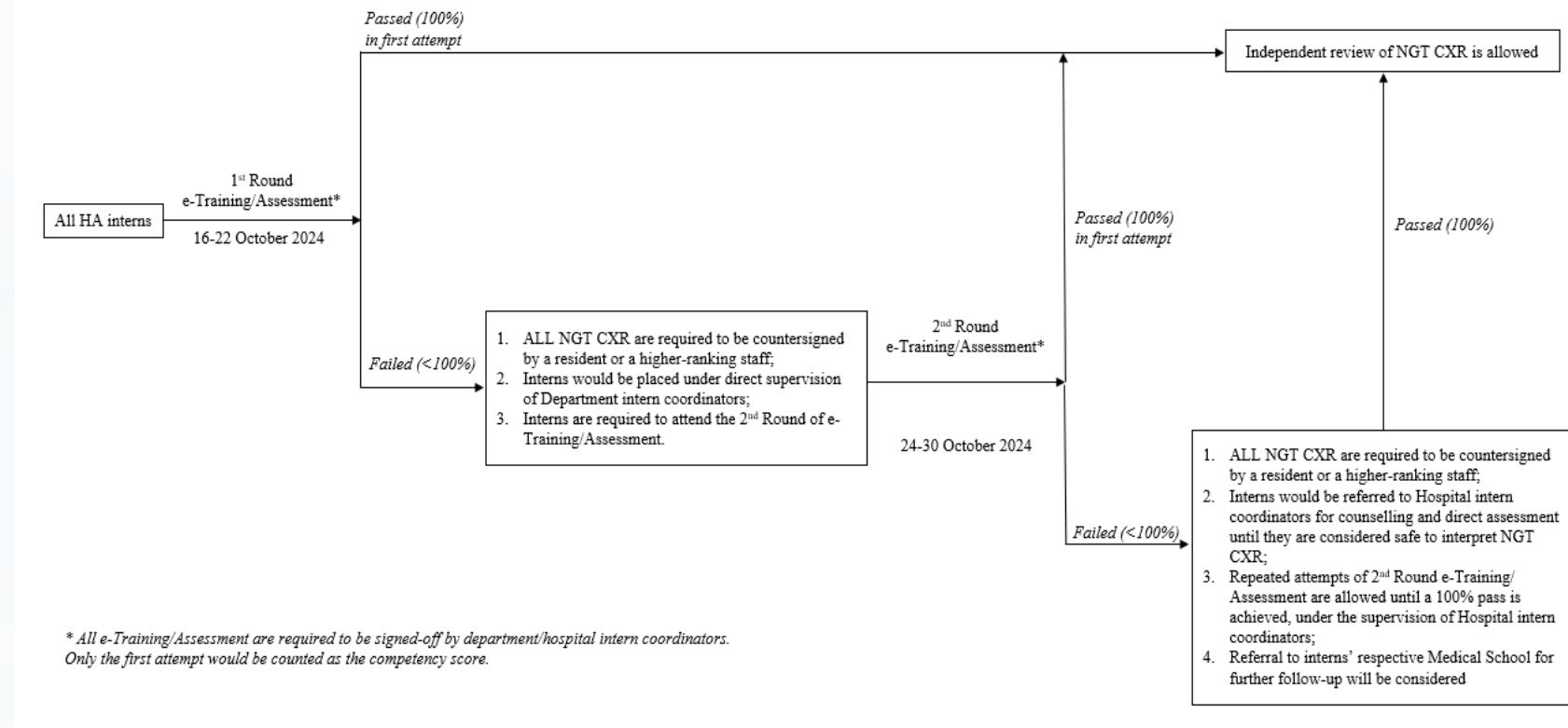
19 interns needed retraining, and all completed by 1 November 2024.

100%

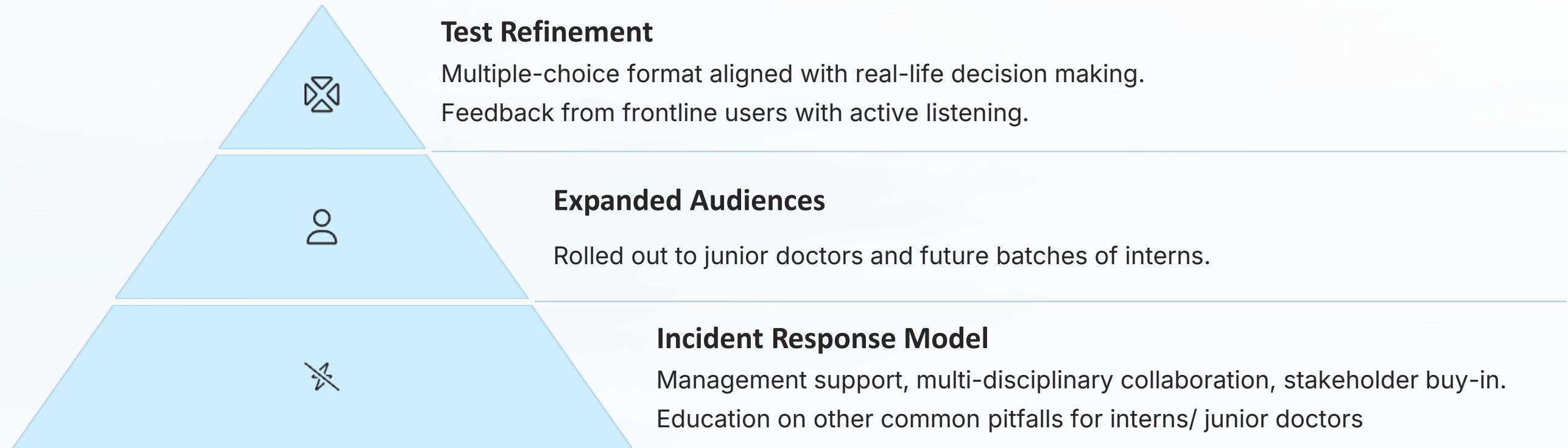
Completion Rate

All retraining completed by November 1, 2024.

Flowchart on e-Training and Competency Assessment Test for Intern on Chest X-ray (CXR) Confirmation of Nasogastric Tube (NGT) Position



Way Forward



Acknowledgement

Dr Michael Wong, D(Q&S)

PS&RM team, HOQ&S Unit

HO Human Resources (Staff Development & Communications team)

Medical Grade Unit, HOCS

Q&S Units of all 7 hospital clusters

COC Radiology

Radiology Departments (KWC, KCC, NTWC, NTEC)

Thank You