



Service Priorities and Programmes
Electronic Presentations

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Using Artificial Intelligence to Prevent Guidewire Retention from Central Venous Catheterization Procedures in Operating Theatres

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Introduction

Incidents of retained guidewire happen from time to time in HA hospitals. There were 5 retained guidewire cases during 4Q14-3Q15 (2 cases from 4Q16-1Q17). Central venous catheterization (CVC) is one of the risky procedures for guidewire retention. To ensure surgical safety, the operating theatre of Tseung Kwan O Hospital (TKOH) has implemented the Perioperative Nursing Information System (PNIS) since 2014. With the help of the electronic system's artificial intelligence, the effectiveness of PNIS has been proven by achieving zero retained surgical items incidents in the operating theatre of TKOH since implementation.

To address the potential risk of guidewire retention related to CVC procedures, paper form safety checklist is currently used in TKOH wards. The PNIS administrative team regarded this as a potential system enhancement; a safety checking function for CVC procedures has been incorporated in PNIS since October 2017. Patients' safety is further safeguarded by the artificial intelligence of PNIS.

Objectives

1. To prevent guidewire retention of CVC procedure in the operating theatre
2. To improve the effectiveness and transparency of CVC safety checking documentation in operating theatre

Methodology

The administrative team of PNIS designed the additional CVC procedure safety checking function since September 2017 after extensive consultation and making reference to the paper form safety checklist used in wards. The functions included:

1. Recording site of CVC procedure
2. Documenting the number of guidewires used and removed, with safety alert warning the users when guidewire in-situ.
3. Checkbox confirming that the quantity and integrity of the guidewires removed have been counter-checked. There will be alert prompting users if counter-checking is not

conducted.

4. Documenting the personnel (anaesthetist and nurse) involved in counter-checking. Staff briefing was performed before launching the new function. The documentation of CVC safety checking is uploaded to Clinical Management System (CMS) as a part of PNIS records.

Result

No retained guidewire incidents have occurred in TKOH operating theatre since implementation of the new CVC safety checking function in PNIS, though the function is still at the pilot stage. As an electronic platform, the safety features of PNIS is still very expandable to cope with the new challenges from the every-changing environment in perioperative setting.