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Challenges and Recommendations for Medical Device Tracking and Traceability in Singapore: A Focus on Nursing Practices

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Abstract : The paper examines the challenges facing the Singapore healthcare system related to the tracking and traceability of medical devices. One of the major challenges identified is the lack of a standard coding system for medical devices, which makes it difficult to track them effectively. The paper suggests the use of the Unique Device Identifier (UDI) as a single standard for medical devices to improve tracking and reduce errors. The paper also explores the use of barcoding and image recognition to identify and document medical devices in nursing practices. In nursing practices, the use of barcodes for identifying medical devices is common. However, the information contained in these barcodes is often inconsistent, making it challenging to identify which segment contains the model identifier. Moreover, the use of barcodes may be improved with the use of UDI, but many subsidized accessories may still lack barcodes. The paper suggests that the readiness for UDI and barcode standardization requires standardized information, fields, and logic in electronic medical record (EMR), operating theatre (OT), and billing systems, as well as barcode scanners that can read various formats and selectively parse barcode segments. Nursing workflow and data flow also need to be taken into account. The paper also explores the use of image recognition, specifically the Tesseract OCR engine, to identify and document implants in public hospitals due to limitations in barcode scanning. The study found that the solution requires an implant information database and checking output against the database. The solution also requires customization of the algorithm, cropping out objects affecting text recognition, and applying adjustments. The solution requires additional resources and costs for a mobile/hardware device, which may pose space constraints and require maintenance of sterile criteria. The integration with EMR is also necessary, and the solution require changes in the user's workflow. The paper suggests that the long-term use of Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT) as a supporting terminology to improve clinical documentation and data exchange in healthcare. SNOMED CT provides a standardized way of documenting and sharing clinical information with respect to procedure, patient and device documentation, which can facilitate interoperability and data exchange. In conclusion, the paper highlights the challenges facing the Singapore healthcare system related to the tracking and traceability of medical devices. The paper suggests the use of UDI and barcode standardization to improve tracking and reduce errors. It also explores the use of image recognition to identify and document medical devices in nursing practices. The paper emphasizes the importance of standardized information, fields, and logic in EMR, OT, and billing systems, as well as barcode scanners that can read various formats and selectively parse barcode segments. These recommendations could help the Singapore healthcare system to improve tracking and traceability of medical devices and ultimately enhance patient safety.

Keywords : medical device tracking, unique device identifier, barcoding and image recognition, systematized nomenclature of medicine clinical terms
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