Health PEI

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Data Integrity in Healthcare: Protecting Patients and Providers

Data integrity refers to protecting data from unauthorized changes to its attributes including its accuracy and reliability. It also refers to ensuring the consistency of data across different systems. The integrity of health data is crucial for patient safety to ensure accurate diagnoses and treatment; continuity of care; regulatory compliance; and patient trust.

Discrepancy between Data Quality and Data Integrity

Data quality looks at how good the data is based on accuracy, completeness, uniqueness and timeliness. Data integrity is the overarching principle that ensures data attributes are kept secure, unaltered, and trustworthy over its entire lifecycle. It is also different in applicability, especially in multiple systems throughout the data lifecycle i.e. data integrity applies to all the stages of the data life cycle, from creation and storage to retrieval and deletion, by enforcing rules and standards that prevent unauthorized data alterations.

Causes of Data Compromises related to Data Integrity

There are two major causes of data integrity issues (Patrick et al (1978):

- Physical Data Integrity
- Logical Data Integrity

While the former includes factors that deal with the wholeness of the data, the latter refers to factors that could potentially compromise the protection of data and access for relevant stakeholders.

Common issues in healthcare data integrity

Physical Data Integrity	Logic Data Integrity
Natural disasters	Duplication of record
Power outages	Inconsistent data
Human error	Regulatory compliance
Cyberattacks	Storage and use

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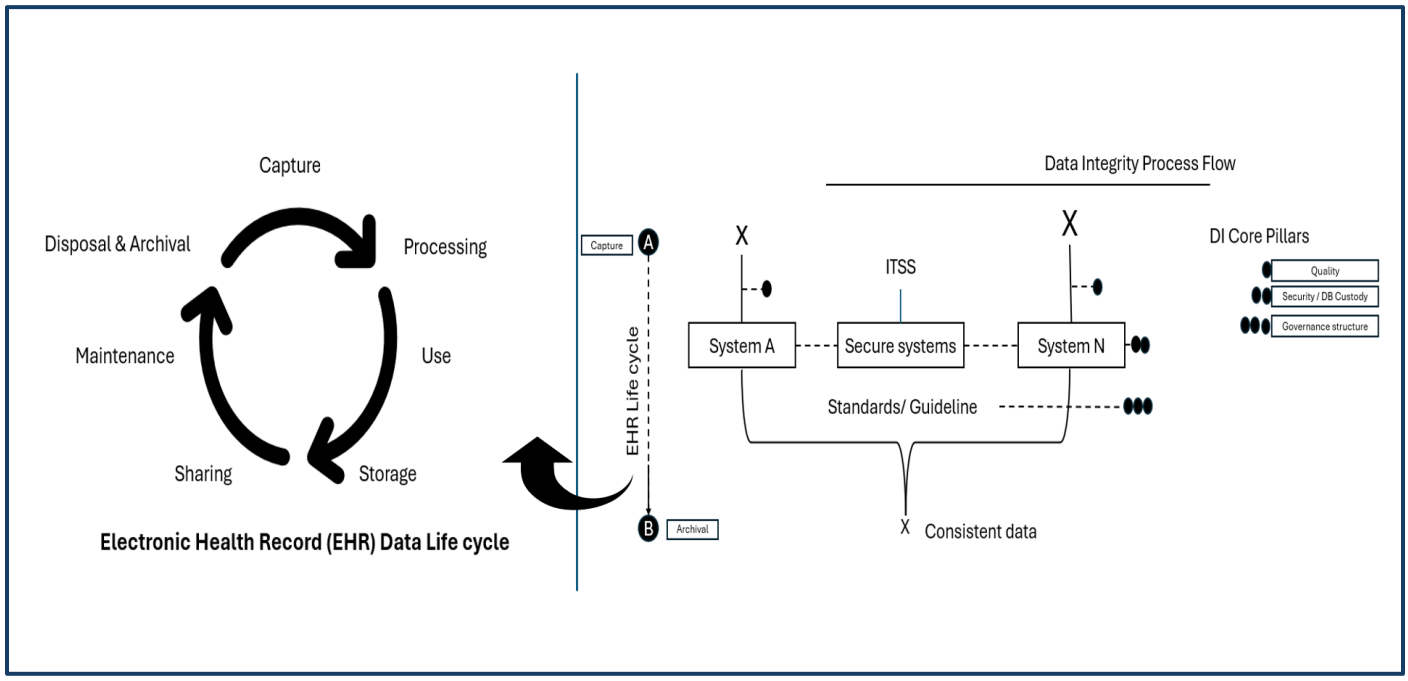

Fig 1. Data Integrity in Multiple Systems and Data Life Cycle:

The flow diagram "Data Integrity in Multiple Systems and Data Life Cycle " outlines the Electronic Health Record (EHR) Data Life Cycle, which includes capturing, processing, storing, and disposing or archiving patient data. It emphasizes maintaining data integrity through a governance structure, ensuring security and proper database custody, maintaining high-quality and consistent data, and following established standards and guidelines. The core pillars of data integrity are the system's data quality check, secure system's data attributes, and adherence to standards/guidelines, all aimed at protecting the data attributes throughout its lifecycle within and across systems.

Example:

Setting: Nurse Manager's Report

Characters:

- **Nurse A**: Documents patient's level of pain in a pain assessment form based on protocols as trained.
- **Nurse B**: Documents level of pain in a progress note.
- **Charge Nurse Jane**: Requests a report that captures pain level experienced 24hrs and 48hrs post hip replacement surgery to ensure pain is being managed.

Implications:

When the report is run it will capture the information in the pain assessment forms but not the results captured in the progress note. Data is lost or inconsistently recorded. *What effect can this have on decision making? And how can this be resolved?*

In conclusion, it is essential to:

- Regularly train staff on the importance of data integrity and the potential consequences of errors, emphasizing the need for careful verification even in high-pressure situations.
- Additionally, ensuring compliance with existing guidelines and advocating for the establishment of new standard operating procedures or guidelines is crucial.
- Finally, it is vital to ensure that all patient information is recorded accurately and promptly, which includes double-checking entries for errors and updating records as soon as the latest information becomes available.

Sources:

Patrick, R. and Blanc, R. (1978), Performance Assurance and Data Integrity Practices, Special Publication (NIST SP), National Institute of Standards and Technology, Gaithersburg, MD, [online], https://doi.org/10.6028/NBS.SP.500-24 (Accessed March 4, 2025)

David Flater (2003), A Logical Model of Conceptual Integrity in Data Integration, J. Res. Natl. Inst. Stand. Technol. 108, 395-402 (2003) https://www.pharmaceuticalonline.com/doc/these-were-fda-s-top-citation-issues-for-data-quality-in-0001