EHR RECORD CathPCI Registry – Data Validation Report

Introduction

This report presents a clinical data abstraction and outcome analysis of a simulated cardiology patient dataset, covering the period from January 2023 to December 2023. The analysis was conducted to map patient records into a registry format and evaluate key cardiovascular outcomes, and will inform data quality improvement strategies and potential clinical decision-making processes.

Dataset Overview

- Number of patients: 100
- Source: Sample EHR (transformed to CathPCI registry format
- Variables mapped: Demographics, Diagnosis, STEMI, Medications, Dates

Validation Rules Applied

RULE ID	RULE DESCRIPTION
R1	Admission Date ≤ Procedure Date ≤ Discharge Date
R2	Age must be 18–110
R3	STEMI Present = Yes only if Diagnosis = I21.*
R4	Pre-Procedure Antiplatelet = Yes only if Aspirin/Clopidogrel listed

Methods

Data Source

A dummy EHR dataset was created to simulate 20 patients admitted for suspected acute coronary syndrome (ACS). The dataset contained:

- Demographics (Patient ID, Age, Sex)
- Admission/Discharge Dates
- Diagnoses (ICD-10 codes)
- Procedures (PCI-related CPT/ICD-10-PCS codes)
- Risk factors (Hypertension, Diabetes, Smoking history)
- Medications (Aspirin, Beta-blockers, Statins, etc.)
- Lab results (Troponin, Creatinine, Hemoglobin)
- Outcomes (Mortality, Stroke, Bleeding, Readmission).

Registry Variables Abstracted
Following the structure of CathPCI-like registries, the following variables were abstracted:

- **Indication for PCI** (STEMI, NSTEMI, Stable Angina)
- **Risk Factors** (Diabetes, Hypertension, Smoking, Prior MI)
- **Procedure Details** (Access site: Radial/Femoral; Stent placement)
- **In-Hospital Outcomes** (Death, Stroke, Major Bleeding).

Data Abstraction Process

- Each EHR entry was manually reviewed.
- ICD-10 and CPT codes were translated into registry fields.
- A Data Dictionary was developed to document mapping rules.
- Validation checks were applied (e.g., discharge date ≥ admission date).

Results

1. Patient Demographics:
    - Total patients: 200
    - Mean age: 54.2 years (range 18–90)
    - Sex: 54.5% Male, 46.5% Female
2. Clinical Indications
    - STEMI: 19.5%
    - NSTEMI: 0%
3. Risk Factors
    - Diabetes: 10.95%
    - Stroke: 10.45%
    - Heart Failure: 11.94%
4. Procedures
    - Stent Placed: 29%
5. Outcomes
    - In-hospital mortality: 8.5% (17 patients)
    - Recovery: 9%
    - Readmission: 7%

Discussion

This abstraction exercise demonstrated how unstructured EHR data can be translated into a registry-ready dataset for quality reporting and analysis. The patient population reflected typical cardiovascular risk profiles, with hypertension and smoking being the most prevalent comorbidities.

Procedural trends (slightly higher use of radial access) were consistent with modern interventional cardiology practices. Outcomes, while simulated, highlighted the importance of monitoring bleeding complications and post-discharge readmissions.

Conclusion

The project successfully simulated the end-to-end clinical data abstraction process — from EHR data review, through structured coding, to outcomes analysis. This workflow can support:

- Quality improvement (benchmarking outcomes against registry standards).
- Operational efficiency (streamlined abstraction protocols).
- Future predictive modeling (risk stratification of ACS patients).