# Quality and Safety Use Case for ICD-11

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### ICD-11 use cases

Uses of the ICD are diverse and widespread and much of what is known about the extent, causes and consequences of human disease worldwide relies on use of data classified according to ICD. See below just a few examples:

Certification and reporting of Causes of Death	Antimicrobial resistance (AMR)
Show more (	+) Show more (+
Morbidity coding and reporting including Primary care	Interoperability standards in WHO Digital Guidelines and for Digital Documentation of COVID-19 Certificates (DDCC)
Show more (	+) Show more (+
Casemix and Diagnosis-Related Grouping (DRG)	Coding traditional medicine conditions
Show more (	+) Show more
Assessing and monitoring the safety, efficacy, and quality of ca	are Assessing functioning
Show less	Show more (+
Quality of care uses ICD-coded information to describe the situation of the patient, outcome of treatment and incidents or near-incidents including mechanisms and involved objects such as the failure of an infusion pump or accidental wrong dosage of a medicament by the patient in line with the WH	the studies
recommendations for patient safety incident reporting and learning systems (page 12).	Show more (+

#### Cancer registries

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## Key features of ICD-11 for Q&S use case

- Underlying Foundation or semantic knowledge base
- Clustering to express relationships among diagnoses, using extension codes with stem codes
- Postcoordination using 3-part model to explain harm, cause, and mode or mechanism
- Robust coding tools with potential for automated code-building from free text in the EHR

## **Extension codes**

Add-ons to be attached to a diagnosis to capture the granularity of clinical documentation – if/when needed



Courtesy of: Islam Ibrahim MB BCh, MPH, PhD National Center for Health Information (WHO-FIC CC), MOH, Kuwait

# Three-part model

The 3-part model for capturing healthcare-related adverse events in ICD-11 consists of:

- 1. A healthcare-related activity that is the cause of injury or other harm (selected from Chapter 23 of ICD-11);
- 2. A mode or mechanism of injury or harm, related to the underlying cause (also from Chapter 23 of ICD-11); and
- 3. The harmful consequences of the event to the patient, selected from any of Chapters 1 through 22 of ICD11 (most importantly, the injury or harm experienced by the patient)

Southern DA, Harrison JE, Romano PS, Le Pogam MA, Pincus HA, Ghali WA. The three-part model for coding causes and mechanisms of healthcare-related adverse events. *BMC Med Inform Decis Mak*. 2022 Feb 24;21(Suppl 6):376. doi: 10.1186/s12911-022-01786-w.



"Mode or Mechanism" of harm e.g. overdose/underdose for substances e.g. accidental perforation for procedures e.g. dislodgement/malfunction for devices e.g. mismatched blood used in transfusion for other aspects of care

Southern DA, Pincus HA, Romano PS, Burnand B, Harrison J, Forster AJ, Moskal L, Quan H, Droesler SE, Sundararajan V, Colin C, Gurevich Y, Brien SE, Kostanjsek N, Üstün B, Ghali WA; WHO ICD-11 Revision Topic Advisory Group on Quality & Safety. Enhanced capture of healthcare-related harms and injuries in the 11th revision of the International Classification of Diseases (ICD-11). *Int J Qual Health Care*. 2016 Feb;28(1):136-42. doi: 10.1093/intqhc/mzv099.

# Example of application of 3-part model

A patient had a left knee-replacement less than a year ago, because of arthritis. The implanted device has come loose, resulting in pain and reduced function

Harm: Pain in joint ME82; Specifc Anatomy (use additional code, if desired) Knee joint XA8RL1; Laterality (use additional code, if desired)—Left XK8G

Cause: Orthopaedic devices associated with adverse incidents, prosthetic or other implants, materials or accessory devices PK99.2

Mode: Dislodgement, misconnection or de-attachment, as mode of injury or harm PL12.4

Code Structure: ME82&XA8RL1&XK8G/PK99.2/PL12.4

Southern DA, Harrison JE, Romano PS, Le Pogam MA, Pincus HA, Ghali WA. The three-part model for coding causes and mechanisms of healthcare-related adverse events. *BMC Med Inform Decis Mak*. 2022 Feb 24;21(Suppl 6):376. doi: 10.1186/s12911-022-01786-w.



International Journal for Quality in Health Care, 2017, 29(4), 548–556 doi: 10.1093/intqhc/mzx070 Advance Access Publication Date: 17 June 2017 Article

Article

## A World Health Organization field trial assessing a proposed ICD-11 framework for classifying patient safety events

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### Purpose:

Proof of concept  $\rightarrow$  Can we apply the threepart model to representative patient safety cases?

### Approach:

All reviewers reviewed 45 cases Identified from three sources: 15 cases identified from field work at 4 Canadian hospitals; 15 cases identified from CIHI's training set; 15 cases identified from AHRQ PSNet cases;

## Analysis:

Assessed consistency and coverage, opportunities to improve coding tools 20/45 could have harm, cause, mode classified 5/45 had no harm ("near miss"), but could have cause, mode classified 20/45 missing information about cause and/or mode of harm

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## Spotlight on ICD-11: New Features and New Opportunities

#### Research

Work for the series of articles has been undertaken by the WHO-fic (World Health Organization Family of International Classifications) Network. Funding from the Canadian Institutes for Health Research (CIHR) and the Agency for Healthcare Research and Quality (grant number 5R13HS020543-02) supported aspects of this work and activities of several of the authors. The articles have undergone the journal's standard peer review process for supplements. The Supplement Editors declare that they have no competing interests.

Edited by Danielle A Southern, Harold A Pincus, Olafr Steinum and William A Ghali. ICD-11: an international classification of diseases for the twenty-first century

The International Classification of Diseases (ICD) has long been the main basis for comparability of statistics on causes of mortality and morbidity between places and over time. This paper provides an overvie...

James E. Harrison, Stefanie Weber, Robert Jakob and Christopher G. Chute

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#### Free-text clinical note (authored by physician):

58-year-old male with class III CHF presents with acute pulmonary edema due to inappropriate low furosemide dose in the setting of chronic LV dysfunction (EF30%)

#### Controlled terminology (underlined terms):

Patient harm:

 Outcome: <u>Pulmonary oedema</u> caused by: <u>underdosing as a mode</u> of injury

Patient's underlying condition:

 Diagnosis: Left ventricular failure with reduced ejection fraction; Duration: Chronic; Severity: NYHA Class III

#### ICD-11 Codes:

#### Patient harm: CB01/PL13.7 Patient's underlying condition: BD11.2/XT8W/XS9T

Fig. 1 Example of ICD-11 terms and codes derived from a clinical note



Fig. 2 Application programming interface facilitates patient safety workflow by linking software solutions (for example incident reporting software) and the WHO ICD-11 code finder solution

## Personal observations

- ICD-11 will create new opportunities for tracking and understanding harms that patients experience in health care.
- ICD-11 allows linkage of outcomes of care with specific process failures, incorporating results of quality improvement activities.
- ICD-11 is designed for compatibility with AHRQ's Common Formats and other tools for describing patient safety events and will catalyze global advances in patient safety surveillance.

Forster, A.J., Chute, C.G., Pincus, H.A. et al. ICD-11: A catalyst for advancing patient safety surveillance globally. BMC Med Inform Decis Mak 21 (Suppl 6), 383 (2021). https://doi.org/10.1186/s12911-023-02134-2