

Injury & External Causes in ICD-11

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- *Background: ICD-10, ICECI, etc.*
 - The classification and its uses
 - ICD-10, clinical modifications, ICECI, etc.
- *Proposals for ICD-11*
 - Injury
 - External causes
 - Overlap issues
 - Versions
- *Issues & questions*
 - Beta and beyond

Background to ICD-11

Proposals for ICD-11

- *Overall principles of revision*
- *Injury*
- *External causes*
- *Overlap issues*
- *Versions*

Principles of the revision

- *Only change if good reason*
- *Sources:*
 - *Clinical modifications of ICD-10*
 - *Injury research*
 - *ICECI (distils much reaction to ICD-10 Ext C)*
 - *Submissions and advice*

Injury chapter

- *Background*
 - *Not primarily used for UCoD; focus is on clinical uses.*
 - *Clinical modifications provide evidence of clinical demand for content beyond ICD-10*
 - *Major structural changes 9 to 10; more modest this time*

Injury chapter

- *Overview:*
 - *4-character level in ICD-10 largely unchanged*
 - *e.g. still categories such as “Open wound of scalp” and “Fracture of neck of femur” ordered and organised largely as in ICD-10, though with new codes.*
 - *Exceptions (some tbc):*
 - *A few 4th character codes are reorganised as part of changes to implement extensions from clinical versions (will return to this later)*
 - *S06 Intracranial injury is still under discussion*
 - *Complications (T80-T88) affected by proposals for Q&S*
 - *Poisons (T36-T65) to ‘whole of ICD-11’ list (tbc)*

Injury

Clinical modifications of ICD-10 provide anatomical detail & other characteristics. In ICD-11:

- *Anatomic detail*
- *Other characteristics present in the injury chapters of clinical modifications of ICD-10*

Injury

Clinical modifications of ICD-10 provide anatomical detail & other characteristics. In ICD-11:

- *Anatomic detail*
 - *Detail beyond that embedded in the first four characters will be mostly be coded by use of a special Anatomy chapter. This includes (inter alia) the anatomical detail present in the injury chapter of clinical modifications, including ICD-10 -AM, -CA , -CM and others.*
 - *Anatomic detail will be recorded as additional codes.*
- *Other characteristics present in the injury chapters of clinical modifications of ICD-10*

Injury

Clinical modifications of ICD-10 provide anatomical detail & other characteristics. In ICD-11:

- *Anatomic detail*
- *Other characteristics present in the injury chapters of clinical modifications of ICD-10*
 - *e.g. type of superficial injury, whether fracture is open, whether open wound is contaminated, size of burn.*
 - *Most of these are ‘pre-coordinated’ in ICD-11*
 - *A few will require multiple-coding:*
 - Size of burns*
 - Laterality (this is a whole-of-ICD11 construct)*
 - Characterisation of TBI (under discussion)*

Injury

– *Notable enhancement of particular topics:*

- *TBI: additional anatomical specification plus*
 - *revised duration of coma/reduced conscious state*
 - *proposal for GCS plus pupil state*
(under discussion with Neurology TAG & others)
- *Burns: additional specification of depth (5 levels)*
 - *Old partial thickness split into superficial & deep*
 - *Additional deep full thickness / complex*
- *SCI: ASIA categories of completeness*
- *Fractures: whether open (as in ICD-10); now also whether comminuted, intra-articular, displaced.*
- *Illness due to strenuous physical exercise.*
- *Complications of care (discussed later)*

Injury

- *Not achieved:*
 - *Formal relationship with AIS*
 - *But better alignment for some injuries.*
- *What now?*
 - *Not yet in beta browser.*
 - *Expect upload within two weeks*
 - *Please look and comment*

External causes

- *Background*
 - *Used for UCoD; injury chapter is not.*
 - *Clinical modifications provide evidence of demand for content beyond ICD-10*
 - *Fairly minor changes 9 to 10; followed by critiques and development of alternatives. More far-reaching revision this time.*
 - *Several versions in development. Discussion here refers to the one designed with hospital case data in mind (except where stated otherwise)*

More uniform structure

- *Revision*

- *Much advice and input from TAG led by Kirsten McKenzie and Lois Fingerhut.*

Summarised in:

McKenzie K, Fingerhut L, Walker S, Harrison A, Harrison JE. Classifying External Causes of Injury: History, Current Approaches and Future Directions for the International Classification of Diseases. *Epidemiologic Reviews* 2012 34(1): 4-16

- *This distillation of TAG recommendations has been followed. Flaws in implementation are due to me.*

Recommendations

- All mechanisms/objects codable for all intents
- More uniform code structure
- Revised 'Intent' dimension
 - (n.b. Intent pending; ISH: suicidal/non-suicidal)
- Retain transport codes, but expand vehicle types
- Expanded Place of Occurrence codes
- Expanded and revised Activity dimension
 - (n.b. work-relatedness)
- Revision of Complications of Medical & Surgical Care
- Expanded Legal/War Codes
- Improved provision for maltreatment syndromes
- Introduction of additional dimensions (optional)
- Revision of External Cause index, rules and guidelines
- Provide for Mortality, Morbidity, Lower Resource Settings, Research.

More uniform structure

“All mechanisms/objects codable for all intents”
is a special case of this.

- Exceptions: (see later)
 - Complications of care
 - War

Achieved by combining each main intent type
with each of a standard set of codes that
combine [Mechanism and Object]

Variation from this: Mechanism=Transport (see later)

Nearly all external causes distinguished in
ICD-10 continue to be distinguishable

- Exceptions: some complications & residuals

Revised intent dimension

– Main changes are

- Addition of ‘intent pending’ category
 - i.e. intent not yet formally decided
 - differs from ‘undetermined’ (i.e. could not be decided)
- Allow distinction of whether ISH is suicidal
 - Allows for coding of self-mutilation, etc.
 - via extension to Activity

– Concept order:

- Consideration was given to revising concept order in combined codes to place intent after mechanism
- Strong resistance emerged: concerns re possible effect on time series and on priority accorded to suicide. Did not proceed with this.

Transport codes & vehicle types

The V-range in ICD-10 has an implicit structure:

- injured person's mode of transport by
- his or her road user role (e.g. driver) by
- what was hit, if anything (counterpart) by
- whether the event occurred in traffic or not.

This was made explicit and more regular in ICECI and that has been carried through to ICD-11.

Some types of vehicle not codable in ICD-10 but codable in ICECI and some clinical modifications will be distinguished (notably pedestrian conveyances). To-and-fro on whether to retain three-wheelers as a top-level type of vehicle.

Place & Activity

- Separate dimensions in ICD-11
 - *As in some clinical modifications of ICD-10*
 - *... and (for Place) in ICD-10 since 2010*
 - *Extended – based on ICECI & clinical mods of -10*
- *Similar base to ICD-10*
 - *Extended in response to demand by reference to ICECI and clinical modifications.*
 - *Standard ‘Activity’ categories have little application when intent=ISH*
 - Used instead to allow distinction of suicidal/non-suicidal act*

Special “intent” values

Two of the code blocks in the ICD-10 External Causes chapter refer to events of types that do not form satisfactory combinations with many of the standard [Mechanism*Object] categories:

- Complications/Quality & Safety
- Legal/War

These blocks have been treated differently.

Complications/Quality & Safety

- *Led by Quality and Safety TAG, which drew on International Framework for Patient Safety*
- *Conceptual model: code separately*
 - **A cause of harm**
 - Procedure, device, substance or other aspect of care
 - For each of these types:
 - **A *mode or mechanism* of harm**
 - *Procedure: e.g. puncture, contamination, burn ...*
 - *Substance: e.g. over/under dose, wrong drug ...*
 - *Device: e.g. failure, error in operation, disconnection ...*
 - *Other: e.g. non-admin of needed drug/procedure, problem in transfer of patient ...*
 - **The resultant injury or harm**
 - Diagnosis code (from any chapter in ICD-11)

Expanded Legal/War Codes

- Proposal is based on the expansion in ICD-10-CM of Y36 & Y37, legal intervention and operations of war.
 - For use as post-coordinated external cause term:
 - [Intent=war]+
 - [Mechanism*Object]+
 - Place+
 - Activity+
 - Code from Operations of War sub-classification.
 - Or alone:
 - [Intent=war]+
 - Code from Operations of War sub-classification.

Maltreatment syndromes

Characteristic	Examples	ICD-10 & clinical modifications	Proposal for ICD-11 (Morbidity)
Status of maltreatment	Confirmed Suspected	ICD-10-CM	Confirmed Suspected
Type of maltreatment	The WHO definition lists: physical abuse; sexual abuse; neglect and negligent treatment; emotional abuse; and exploitation	ICD-10 T74 distinguishes: - Neglect/aband - Physical abuse - Sexual abuse - Psychol. abuse - Other - Unspecified	- Physical abuse - Sexual abuse - Psychological abuse - Neglect or abandonment - Negligent treatment - Exploitation - Other - Unspecified
Injuries suggestive of maltreatment	Metaphyseal and spiral fractures. Patterned burns or bruising.	ICD-10-CM distinguishes metaphyseal and spiral fractures.	At least as in ICD-10-CM. Additional types if technically feasible.
Perpetrator	Broad: parent. Specific: biological father	Broad in ICD-10-AM. Specific in ICD-10-CM.	Perpetrator at broad level (similar to ICD-10-CM 4 char). Not required if maltreatment is unconfirmed. Provide finer classes (similar to ICD-10-CM 5-character level) as option.

Additional dimensions (optional)

- [refer to ICECI dimensions in foundation layer]
- For optional use.
- Post coordinated codes.
- Example: assessed as

Index, rules and guidelines

- Index to be based on Foundation layer
 - Derived computationally, at least initially
- Rules & guidelines: not (yet) altered but need at least some revision (e.g. to include international rules for reporting and tabulating deaths & ‘serious injuries’ due to traffic crashes.

Use-case Versions

Undertook to provide for Morbidity, Mortality, Lower Resource Settings (LRS) and Research

- *Morbidity*: as outlined in this presentation
- *Mortality*: similar, smaller, pre-coordinated
(exact specifications to be worked out in collaboration with the Mortality TAG)
- *LRS*: external causes elements in the core data set specified in WHO manual for fatal injury surveillance
 - intent, mechanism, transport mode/user/counterpart
- *Research*: Revised ICECI Core & Transport
 - Provides basis for optional expansion of Morb/Mort

Overlap issues

- *Safety & Quality: described above*
- *Poisons & toxic substances*
 - *ICD-10: overlap & duplication (Ch 19 & 20)*
 - *ICD-11: [still under discussion]*
 - *One composite list of drugs & chemicals*
 - *Available for use of whole ICD-11*
 - *Though valuable pre-coordination can be retained*
 - *Referred to as needed from Injury and Ext Causes*
 - *Example:*

Out-of-chapter topics

- *Many categories are relevant to more than one chapter of ICD. Technical response:*
 - *Each codable entity appears once in the ‘foundation layer’ (i.e. as a database element)*
 - ... and has one primary location in linearisations*
 - ... but can also appear elsewhere (‘mult parenting’)*
 - e.g. Lung cancer: neoplasms (I⁰) & respiratory dis.*
 - TBI: injury (I⁰) & neurology*
 - Birth injury: perinatal (I⁰) & injury*
 - *By default, I⁰ location=sole location in ICD-10*

Issues & Questions

- *Comment on Beta version*
 - *content more complete soon*
 - *view via browser (register)*
 - *injury & ext cause content more complete soon*
 - *let me know if interested in being invited to review specific sections*

Issues & Questions

- *Discussion-starters*

1. *TBI: anatomy/pathology +
duration of LOC +
GCS + pupil reaction (0, 1, 2 or ?)*

(GCS has 3 dimensions: eye-opening [1-4], motor [1-6], verbal [1-5])

*Considering “morbidity use-case” (equivalent to ICD-10-AM or –CM):
Is this too much? Too little? Is something essential missing?*

Issues & Questions

- *Discussion-starters*

- 2. *TBI: Poisons, etc*

- “whole of ICD-11” list is being developed*

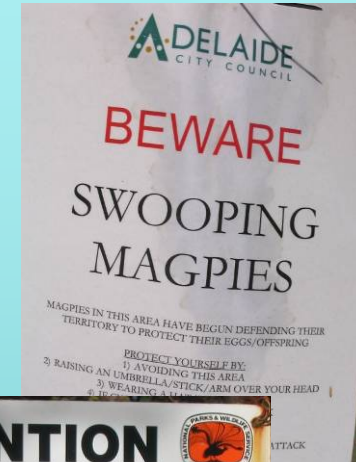
- Could be used to*

- (a) *Replace T36-T65 & perhaps Y40-Y59*

- (b) *Provide hierarchical framework for X40-X49*

- (a) *(and equivalents in other intent blocks)*

Questions welcome



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Appendix 1: worked examples

- *This section presents some examples*
- *A table is used to show how a given condition or external cause is organised and coded under ICD-10, one or more clinical modifications of ICD-10 (were relevant) and proposals for ICD-11.*
- *Codes for ICD-11 remain to be finalised. Those in the examples are synthetic.*

Hip fracture

Version	Coding	Notes
ICD-10	S72.0 Fracture of neck of femur	
ICD-10-AM & ICD-10-GM*	<p>S72.00 Fracture of neck of femur, <i>part unspecified</i> S72.01 Fracture of <i>intracapsular section of femur</i> S72.02 Fracture of <i>upper epiphysis (separation) of femur</i> S72.03 Fracture of <i>subcapital section of femur</i> S72.04 Fracture of <i>midcervical section of femur</i></p> <p>Use additional open wound code S71.81 with S72 to identify open/compound fracture</p>	
ICD-11**	<p>AB0.1 Fracture of neck of femur, closed, not displaced AB0.2 Fracture of neck of femur, closed, displaced AB0.3 Fracture of neck of femur, open, not displaced AB0.4 Fracture of neck of femur, open, displaced</p> <p>Use additional code from Anatomy chapter to further specify anatomical involvement. For example:</p> <ul style="list-style-type: none"> . <i>Articular fracture of head of femur</i> . <i>Intra-capsular fracture</i> . <i>Fracture of upper epiphysis of femur</i> . <i>Mid-cervical fracture of femur</i> . <i>Fracture of base of neck of femur</i> . <i>Articular fracture of head of femur</i> 	<p>The anatomy chapter provides anatomical distinctions at least equivalent to ICD-10 clinical modifications.</p> <p>It is anticipated that only the relevant few entries from the anatomy chapter will be presented to the coder.</p>

* * ICD-10-AM & -GM are the same for this condition. They are used here as examples of clinical modifications of ICD-10.

** Codes for ICD-10 have not been settled. Synthetic codes are used here.

Worked examples: Injury

Open wound of abdominal wall

Version	Coding	Notes
ICD-10	S31.1 Open wound of abdominal wall	
ICD-10-AM*	S31.1 Open wound of abdominal wall Also code: S31.83 if open wound (of any part of abdomen) communicates with an intra-abdominal injury T89.0n if open wound is complicated (by foreign body or infection)	
ICD-11**	AB0.0 Unspecified open wound of abdominal wall AB0.1 Laceration without foreign body of abdominal wall AB0.2 Laceration with foreign body of abdominal wall AB0.3 Puncture wound without foreign body of abdominal wall AB0.4 Puncture wound with foreign body of abdominal wall AB0.5 Open bite of abdominal wall Codes from Anatomy chapter may be used to further specify anatomical location: <ul style="list-style-type: none"> . <i>right upper quadrant</i> . <i>left upper quadrant</i> . <i>epigastric region</i> . <i>right lower quadrant</i> . <i>left lower quadrant</i> . <i>periumbilic region</i> 	The anatomy chapter provides anatomical distinctions at least equivalent to ICD-10 clinical modifications. These anatomical distinctions are made in ICD-10-CM.

* ICD-10-AM & -GM are the same for this condition. They are used here as examples of clinical modifications of ICD-10.

** Codes for ICD-10 have not been settled. Synthetic codes are used here.

Intracranial Injury

Version	Coding	Notes
ICD-10	<p>S06.0 Concussive injury</p> <p>S06.1 Traumatic cerebral oedema</p> <p>S06.2 Diffuse brain injury</p> <p>S06.3 Focal brain injury</p> <p>S06.4 Epidural haemorrhage</p> <p>S06.5 Traumatic subdural haemorrhage</p> <p>S06.6 Traumatic subarachnoid haemorrhage</p> <p>S06.8 Other intracranial injuries</p> <p>S06.9 Intracranial injury, unspecified</p>	
ICD-10-AM & ICD-10-GM*	<p>As above, plus 5th character expansions of certain categories:</p> <p>S06.0n Whether loss of consciousness. If so, its duration.</p> <p>S06.2n Cerebrum <5ml; cerebellum <5ml; multiple/large</p> <p>S06.3n Cerebrum <5ml vs larger; cerebellum <5ml vs larger</p> <p>If an open wound communicates with the brain injury, then also code S01.83 with S06, to record this characteristic.</p>	<p>All codes applicable to a case should be used. E.g. a case with a large focal injury of cerebrum, subdural haemorrhage and persisting coma: S06.33 & S06.5 & S06.05 (also S01.83 if open).</p>
ICD-11**	<p>AB0.nn Type and broad location of intracranial injury</p> <p>Anatomy chapter: Additional code to specify site of injury</p> <p>AB1.nnn Three-level hierarchical classification of LOC and related characteristics (NB its duration)</p> <p>AB2.nnn GCS plus pupil</p>	<p>Based on submission by Neurology TAG.</p> <p>An operational criterion for loss of consciousness (LOC) is required.</p>

* ICD-10-AM & -GM are the same for this condition. They are used here as examples of clinical modifications of ICD-10.

** Codes for ICD-10 have not been settled. Synthetic codes are used here.

Intracranial Injury: type

Version	Coding	Notes
<p>ICD-11 working draft</p>	<p>AB0.1 Traumatic cerebral oedema</p> <p>AB0.2 Diffuse brain injury <i>subdivided by lobe of brain (4 categories)</i></p> <p>AB0.3 Focal brain injury <i>subdivided by whether of cerebrum (distinguishing four lobes), cerebellum, brainstem or multiple and whether haemorrhagic or non-haemorrhagic contusion or laceration (25 categories)</i></p> <p>AB0.4 Epidural haemorrhage <i>subdivided by size, and presence & degree of midline shift (7 categories)</i></p> <p>AB0.5 Traumatic subdural haemorrhage <i>subdivided by size, and presence & degree of midline shift (7 categories)</i></p> <p>AB0.6 Traumatic subarachnoid haemorrhage</p> <p>AB0.7 Traumatic haemorrhage [in brain tissue] <i>subdivided by whether in cerebrum, thalamus or basal ganglia, cerebellum, brainstem (primary or secondary) or multiple (8 categories)</i></p> <p>AB0.8 Other intracranial injuries <i>subdivision: Traumatic intra-ventricular haemorrhage.</i></p> <p>AB0.9 Intracranial injury, unspecified</p>	<p>Detail may be provided via post-coordinated codes from anatomy chapter.</p>

Intracranial Injury (level 2)

Version	Coding	Notes
ICD-11 working draft	<p>Under discussion. A working proposal is to combine type of trauma and effect on conscious state (incl. duration of coma) along lines such as this:</p> <p>AB1.0 Incomplete LOC: temporary brain dysfunction with no complete LOC.</p> <p>AB1.00 temporary confusion without amnesia</p> <p>AB1.01 with pre or post-traumatic amnesia</p> <p>AB1.1 Brief LOC: Loss of consciousness < 6 hours</p> <p>AB1.10 loss of consciousness ≤ 30 mins</p> <p>AB1.11 loss of consciousness 31-59 mins</p> <p>AB1.12 loss of consciousness 1-6 hours</p> <p>AB1.2 Intermediate LOC: Loss of consciousness 6 hours to <24 hours</p> <p>AB1.20 due to mass lesion</p> <p>AB1.21 due to Diffuse Axonal injury (DAI)</p> <p>AB1.22 due to other & unspecified mechanism (includes hypoxia and ischemia)</p> <p>AB1.3 Prolonged LOC: >24 hours with return to pre-existing conscious level</p> <p>AB1.30 due to mass lesion</p> <p>AB1.31 due to Diffuse Axonal injury (DAI)</p> <p>AB1.32 due to other & unspecified mechanism (includes hypoxia and ischemia)</p> <p>AB1.4 Persistant LOC without return to pre-injury level of consciousness</p> <p>AB1.40 LOC persisted >24 hours and until [discharge or the latest assessment]</p> <p>AB1.41 LOC of any duration persisted until death</p> <p>AB1.9 Unspecified duration</p>	<p>Requires a definition of LOC/coma.</p> <p>For discussion with Neurology TAG and others.</p>

Appx 2: current developments

Morbidity version outline: now

- Main section: 3 (+/-4th) post-coord parts:
 - [Intent(6)]*[Mech(1 1)&Obj(varies)] *plus*
 - [Place of occurrence] *plus*
 - [Activity] *plus optionally also*
 - [optional elements from Other Dimensions]
- Complications of care
 - [Q&S TAG structure] (1 part or 2 in Ext C?)

Morbidity version outline: new

- Main section: 3 (+/-4th) post-coord parts:
 - [Intent(5)]*[Mech(>11)&Obj(varies)] *plus*
 - [Place of occurrence] *plus*
 - [Activity] *optionally also*
 - [optional elements from Other Dimensions]
- Complications of care
 - [Q&S TAG structure] (1 part or 2 in Ext C?)
- War
 - (optional) post-coord element, based on ICD-10-CM Y36 & Y37

Morbidity version: Transport

- Current proposal does not provide full Transport module. Could achieve this within “three part” construct by any of:
 - *Put Transp module into a post-coord unit*
 - *We have done this (sort of; in ‘Dimensions’)*
 - *But risks being made “optional”*
 - *Pre-coord full module w/i mech=Transport*
 - *But: mismatched depth over mechs; ‘exploding bike’.*
 - *Split Transp into >1 Mech*
 - *Keeps it ‘mainstream’ and all 4 dims together*
- *Current draft follows last of these.*

Morbidity version: War

- We undertook to provide more detail. Current version doesn't achieve this.
- Many [Mech(1 1)&Obj(varies)] categories look odd when pre-coord with Intent=legal/war
- Available: expanded Y36/Y37 in ICD-10-CM
- Alternative approach:
 - Retain block. Rename 'War'. Replace standard [Mech&Obj] with list based on 10-CM Y36 & Y37
 - Allow its use alone (by analogy with Compls) or as an optional post-coordinated unit (by analogy with drug/alcohol use in optional Dimensions block)
 - 'Legal'? Either value(s) of Activity or in Dimensions

Low Resource version

- Promised
- Source:
- Elements:
 - Intent
 - Mechanism
 - Transport mode, user & counterpart

Full ICECI items as option

- Robert Jakob sees it as feasible to allow use of the full versions of the ICECI items that are in iCAT for optional coding of Morb (or Mort) version to more detail than provided in default version.
- Implications/to do:
 - Make revised ICECI lists (to allow for ICD-11)
 - Have them entered into iCAT as ‘use case’
 - Work out sanctioning rules.