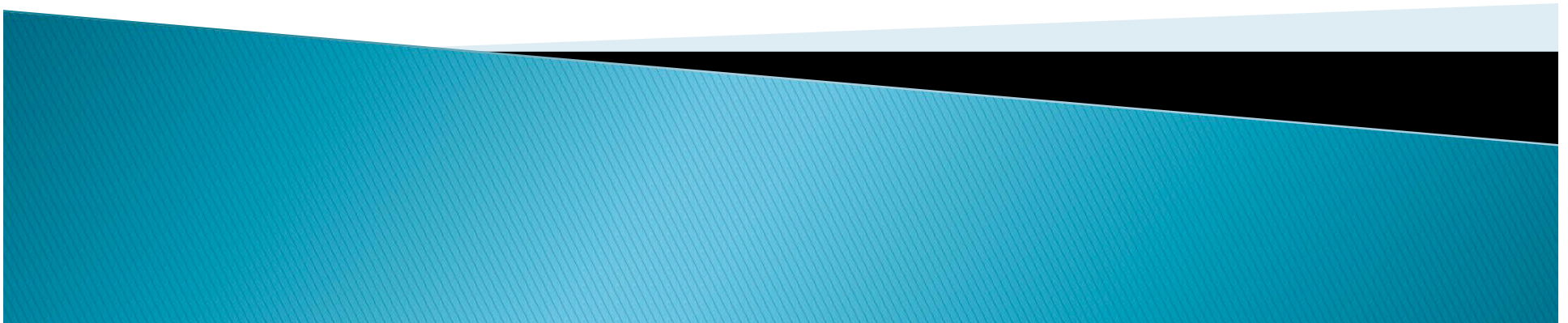


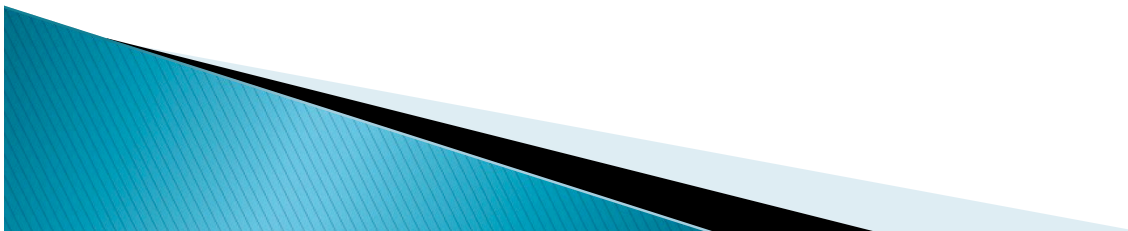
ICD-10-CM and SNOMED Clinical Terms

Redwood Mednet
Connecting California to Improve Patient Care 2012 Conference

Michael Stearns, MD, CPC, CFPC
HIT Consultant



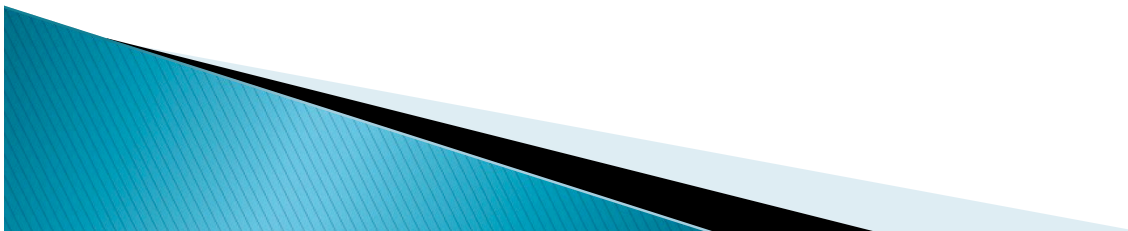
Why is it Important to Codify Clinical Data?



Terminology Challenges

- **Common dilemma associated with trying to extract clinical information from text or even disease registries:**

“Each disease has, in many instances, been denoted by three or four terms, and each term has been applied to as many different diseases: vague, inconvenient names have been employed, or complications have been registered instead of primary diseases.”



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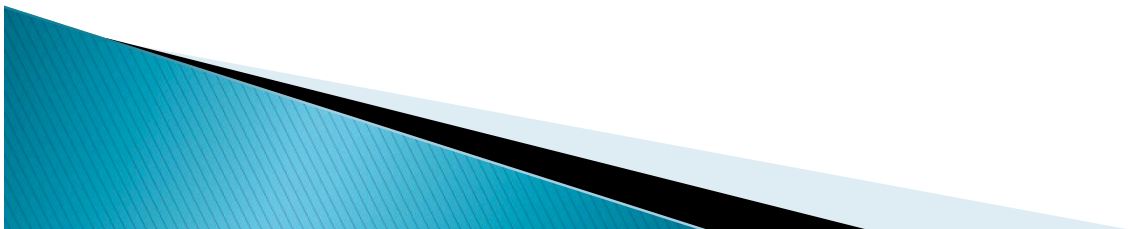
“Each disease has, in many instances, been denoted by three or four terms, and each term has been applied to as many different diseases: vague, inconvenient names have been employed, or complications have been registered instead of primary diseases.”



William Farr (England) 1839

What is Needed?

- ▶ Accurate data captured and stored in a manner that supports:
 - Clinical decision support
 - Interoperability
 - Clinical reporting
 - Clinical research
 - Assessment of clinician performance
 - Public health (e.g., “All health departments have real-time situational awareness of outbreaks”)



Point of Care Data Collection Challenges (continued)

- ▶ Physicians often communicate via complex clinical expressions:
 - E.g., *“doubt multiple sclerosis based on normal MRI and evidence of radiculopathy on nerve conduction and electromyography studies”*
- ▶ Context difficult to codify, especially in situations where patient may be carrying the diagnosis of multiple sclerosis falsely
 - Uncertainty and negation represent significant challenges in data sharing



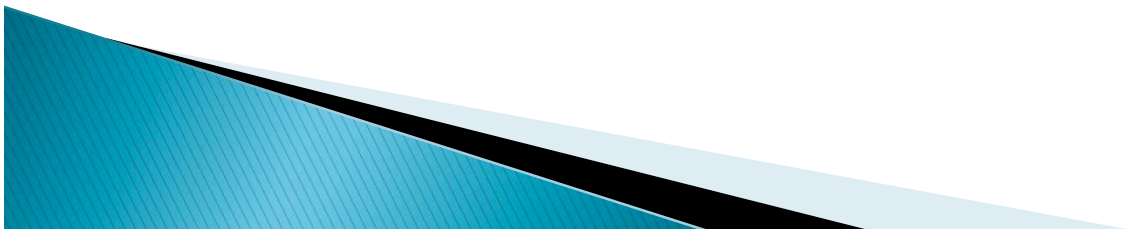
Semantic Interoperability

- ▶ Sharing of codified data between systems that preserves data integrity
 - Complete
 - All components of post-coordinated message, including the proper order of the concepts
 - E.g., “left occipital arteriovenous malformation – ruptured with secondary intracranial hemorrhage and coma – no hydrocephalus.
 - Including modifiers
 - Anatomic
 - Severity
 - Negation
 - Uncertainty
 - Others...
 - Accurate
 - Recognize and preserve negation
 - E.g., “no history of diabetes” does not get mistranslated as “diabetes”



Sample Data Corruption Points

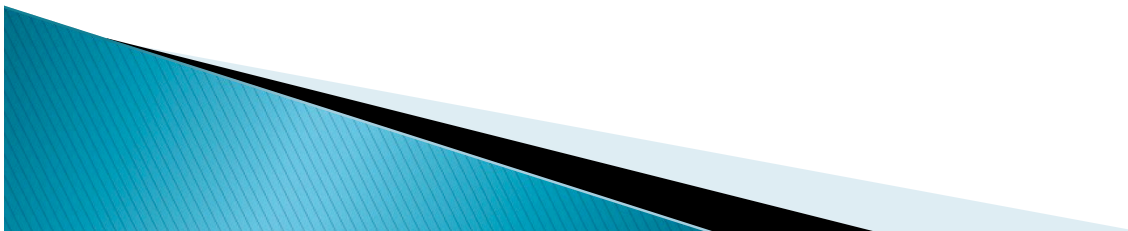
1. Point of care capture (e.g., EHR)
2. Local storage in EHR
3. Export from EHR
4. Data repository storage
5. Import into another EHR system
6. Export from another EHR system
 - a. Clinical care
 - b. Secondary use
7. Data warehouse storage
8. Import in yet another EHR system





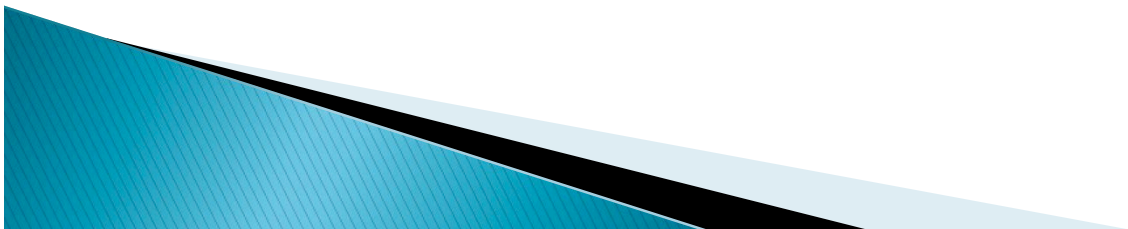
ICD-10-CM

Clinical Challenges Tied to the Use of Claims Data



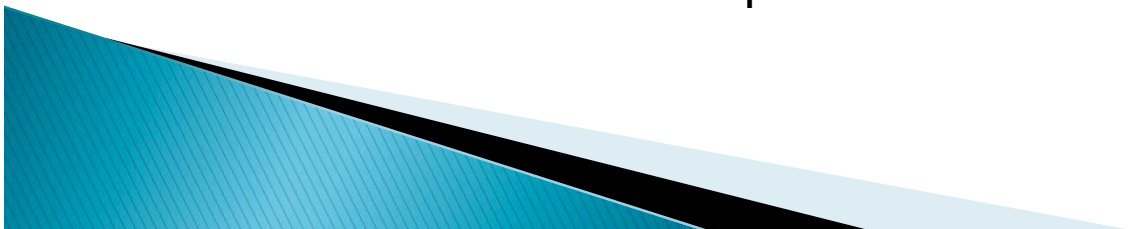
ICD-10-CM – Clinical Use

- ▶ Like ICD-9-CM, ICD-10-CM codes will be chosen by clinicians based on:
 - Identical match to disease (when concept is available)
 - E.g., Appendicitis
 - Best available choice (when no specific concept is available)
 - E.g., for staphylococcal OR streptococcal pericarditis
 - ICD-10-CM code I30.8 (Other forms of acute pericarditis),
or
 - ICD-10-CM code I30.9 (Acute pericarditis, unspecified)



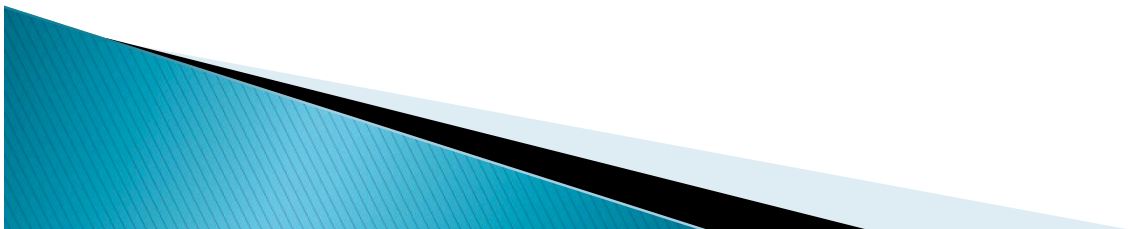
Reason for Choosing an ICD Code (continued)

- ▶ Carrier rules
 - Clinicians may feel compelled to choose a particular code due to insurance rules
 - Personal reimbursement
 - Patient reimbursement
 - Justification of a procedure
 - Justification of admission to hospital
- ▶ E.g., Chronic pelvic pain in ICD-10-CM: How to code to get paid...?
 - R10.2 Pelvic and perineal pain (what if there is no peritoneal pain or if the pain is perineal alone?)
 - R10.30 Lower abdominal pain, unspecified
 - R10.31 Right lower quadrant pain
 - R10.32 Left lower quadrant pain
 - R10.33 Periumbilical pain



ICD-10-CM

- ▶ Emphasis of ICD-10-CM has shifted away from diseases
- ▶ Marked increase in:
 - Chapter VII Diseases of the musculoskeletal system and connective tissue
 - Chapter XIX: Injury, poisoning and certain other consequences of external causes
- ▶ Most clinical categories have increased their available codes by roughly 1.2–2.4 times (as compared to ICD-9-CM)



ICD-10-CM (continued)

- ▶ Markedly expanded from ICD-9-CM
 - From roughly 14,000 to over 80,000 new codes
 - Added laterality and anatomic specificity
 - E.g., Blepharitis (as a general term)
 - One code in ICD-9-CM: 373.00 = Blepharitis, unspecified
 - ICD-10-CM now has 7:
 - H01.001 Unspecified blepharitis right upper eyelid
 - H01.002 Unspecified blepharitis right lower eyelid
 - H01.003 Unspecified blepharitis right eye, unspecified eyelid
 - H01.004 Unspecified blepharitis left upper eyelid
 - H01.005 Unspecified blepharitis left lower eyelid
 - H01.006 Unspecified blepharitis left eye, unspecified eyelid
 - H01.009 Unspecified blepharitis unspecified eye, unspecified eyelid
 - Designed for clinical specificity but also *to identify fraud*



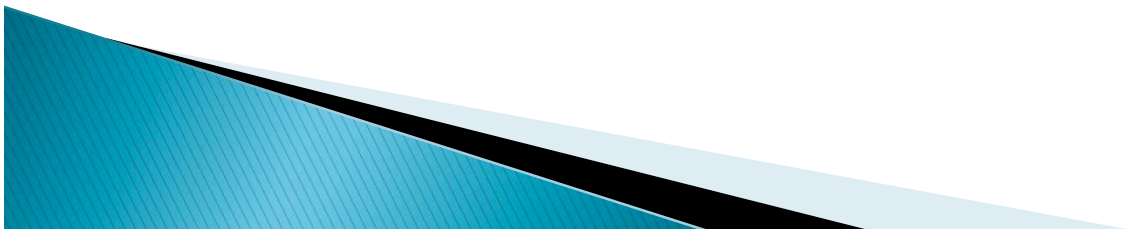
ICD-10-CM – Not Concept Based

- ▶ **G40.3 Generalized idiopathic epilepsy and epileptic syndromes**
 - Benign myoclonic epilepsy in infancy
 - Benign neonatal convulsions (familial)
 - Childhood absence epilepsy [pyknolepsy]
 - Epilepsy with grand mal seizures on awakening
 - Grand mal seizure NOS
 - Juvenile absence epilepsy
 - Juvenile myoclonic epilepsy [impulsive petit mal]
 - Nonspecific atonic epileptic seizures
 - Nonspecific clonic epileptic seizures
 - Nonspecific myoclonic epileptic seizures
 - Nonspecific tonic epileptic seizures
 - Nonspecific tonic-clonic epileptic seizures
 - Petit mal seizure NOS
- Problems....
 - Multiple distinct forms of epilepsy share the same code
 - They are distinct clinical diseases that have different causes, treatments and prognosis
 - This code would not be suitable for use in CDS, reporting, data exchange, research, quality of care assessments, adverse drug event reporting, etc.

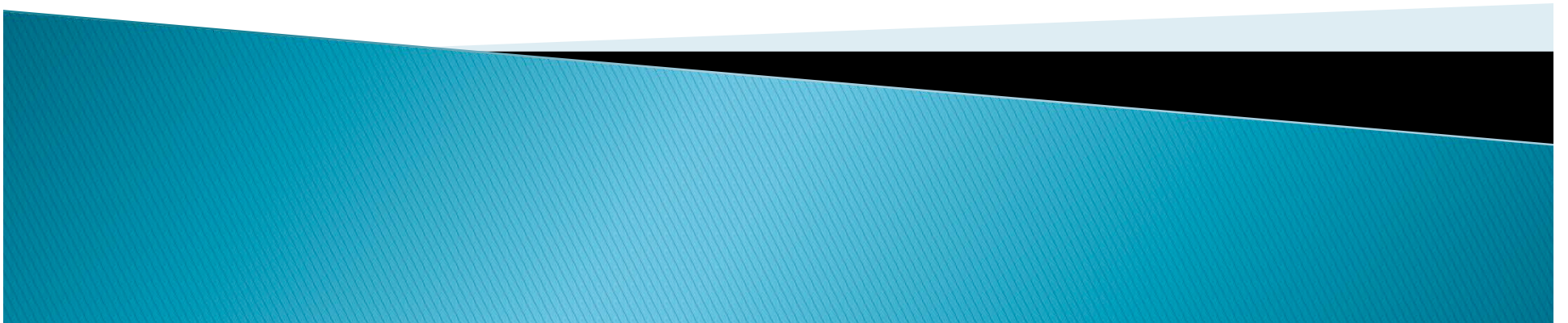


Problem: ICD-10-CM Code R40.2

- ▶ **R40.2 Coma**
 - Coma NOS
 - Unconsciousness NOS
- ▶ Clearly coma and being unconscious for an unspecified period of time are different
- ▶ Downstream impact of inaccurate data difficult to assess, but it may introduce errors that lead to medical misadventures...

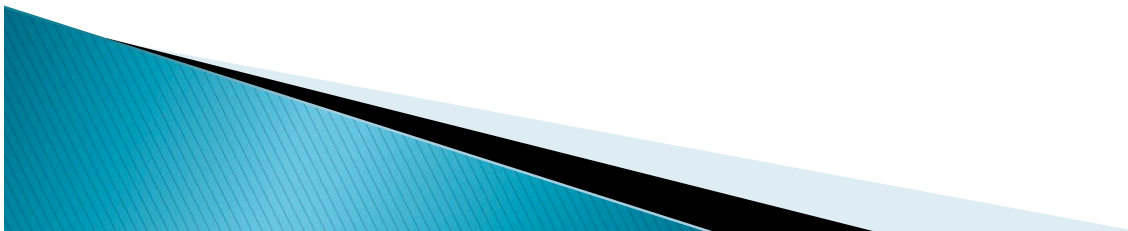


SNOMED CLINICAL TERMS®

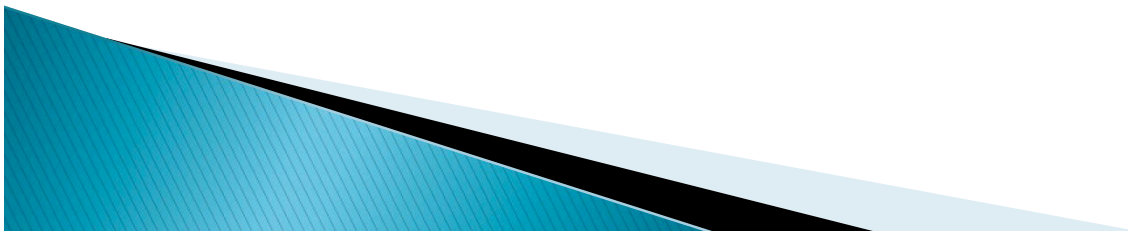


SNOMED CT[®]

- ▶ > 365,000 Concepts
- ▶ > 1,000,000 terms
- ▶ > 1,000,000 logically defined relationships
- ▶ Meets approved federal standards
- ▶ Optional coding terminology (with ICD-9/10-CM) for codification of problem lists in the Continuity of Care Document (CCD) for Meaningful Use



What Criteria Have Been Used to Identify the Ideal Clinical Terminology for Health Information Systems?



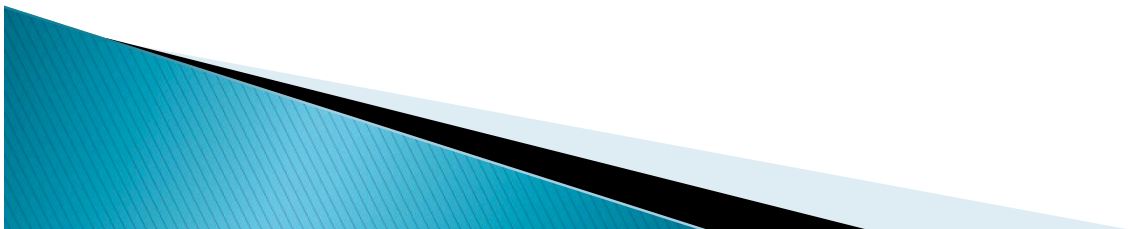
SNOMED CT and ICD-10-CM Comparison Based on the “Desiderata”

Methods Inf Med. 1998 Nov;37(4-5):394-403. Review

Desiderata	SNOMED CT	ICD-10-CM
Content coverage	High	Low
Concept orientation	Yes	No
Concept permanence	Yes	Difficult without above
Non-semantic concept identifiers	Yes	No
Polyhierachy	Yes	No
Formal concept definitions	Yes	No
Rejection of “Not Elsewhere Classified” terms	Yes	No
Multiple granularities	High (20 levels)	Low (four levels)
Multiple consistent views	Yes (can be implemented)	No (very limited)
Context representation	Yes	No
Graceful evolution	Strong history mechanism	Basic history mechanism
Recognized redundancy	Yes	No

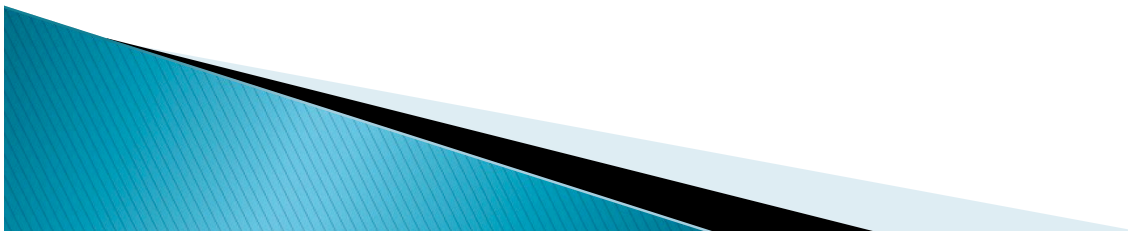
ICD-11?

- ▶ Targeted for release in 2015
- ▶ May be concept based and closely aligned with SNOMED CT
- ▶ Designed for use within EHRs
- ▶ Would allow U.S. to maintain pace with much of the developed world
- ▶ Migration from ICD-9-CM to ICD-11 would be challenging
 - SNOMED CT as core terminology in EHRs now, would make this transition relatively less impactful on healthcare enterprises



Conclusions

- ▶ Interoperability through the sharing of codified data is at the center of advances in the quality and efficiency of healthcare
- ▶ Claims data, including ICD-9/10-CM, should not be used for clinical applications that require a high degree of data integrity
- ▶ Data integrity issues are likely to occur during the early years of data sharing in EHRs and HIEs



Recommendations:

- ▶ Assess value to healthcare of going from ICD-9-CM to ICD-10-CM or directly to ICD-11 / SNOMED CT
- ▶ Maintain linkage to source documentation when using codified data transferred via HIE
 - Educate stakeholders as to the challenges of interoperability and the need to review the source documentation
- ▶ Research and test methods of sharing data in a way that preserves the full context and meaning of the information being shared
- ▶ EHR vendors should strongly consider using SNOMED CT as their core terminology
 - Mappings will allow transition to ICD-10/11



Thank You

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