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## Clinical Care Classification Usability in EHRs using the Healthcare Data Dictionary

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## Objectives

- ▶ Gain a basic overview of the Clinical Care Classification (CCC) System
- ▶ Understand how CCC is mapped to SNOMED CT and LOINC to support interoperability between EHRs
- ▶ Understand how CCC is designed in the HDD (a terminology server)
- ▶ Gain a basic overview of mapsets

## Project Goals

- ▶ Evaluate the CCC
- ▶ Evaluate mappings to SNOMED CT and LOINC
- ▶ Determine if it could be loaded into a terminology server



## Clinical Care Classification System (CCC)

- ▶ Clinical Care Classification (CCC) recognized by ANA
- ▶ Two inter-related terminologies
  - ▶ Nursing Dx and Outcomes
  - ▶ Nursing Interventions and Actions
- ▶ Used to facilitate the capture of standard nursing data
- ▶ Evaluate and measure outcomes
- ▶ Improve practice
- ▶ Determine nursing care cost

## Clinical Care Classification System (CCC)

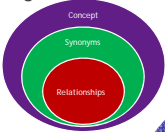
- ▶ 4 Healthcare patterns
  - ▶ Physiological, Psychological, Functional, Health Behavioral
- ▶ 21 Care components (i.e. Activity, Cardiac, Respiratory)
- ▶ 176 CCC Nursing diagnosis/problem concepts
- ▶ 804 Nursing intervention and action concepts
- ▶ 528 Nursing outcome concepts
- ▶ Mapped to SNOMED CT and LOINC

## Clinical Care Classification System (CCC)

- ▶ Coding structure (five alpha-numeric concepts)
  - ▶ 1<sup>st</sup> - Alpha character (Care component: Activity: A)
  - ▶ 2<sup>nd</sup>-4<sup>th</sup> - Two or three digits (nursing Dx or Nursing Intervention)
    - ▶ Activity intolerance - 01.1
  - ▶ 5<sup>th</sup> - Represents outcome or intervention action type
    - ▶ Expected Outcome 'Improve' - 1
- ▶ Full code for Activity Intolerance with an expected outcome of Improve is A01.1.1
- ▶ Full code for Activity Intolerance with the outcome has improved is the same A01.1.1


## Terminology Server

- ▶ Contains a collection of concepts
- ▶ Maps multiple standards to same concept
  - ▶ Synonyms
  - ▶ Interface codes
- ▶ Relationships add meaning
- ▶ One central location



## Evaluation

- ▶ Evaluated CCC model
- ▶ Evaluated mappings to SNOMED CT
- ▶ Evaluated mappings to LOINC




## CCC Model Evaluation


- ▶ Terminology server requires a unique code for a code system
- ▶ CCC has unique codes per use but not per code system
  - ▶ A01.2.1 (Diagnosis/problem/expected outcome) - CCC Expected Outcome Activity Intolerance Risk Improved
  - ▶ A01.2.1 (Diagnosis/problem/expected outcome) - CCC Actual Outcome Activity Intolerance Risk Improved
  - ▶ A01.2.1 - (Intervention) - CCC Energy Conservation Assess/Monitor/Evaluate/Observe

## Evaluation of Mappings to CCC

- ▶ CCC concepts map to SNOMED CT concepts

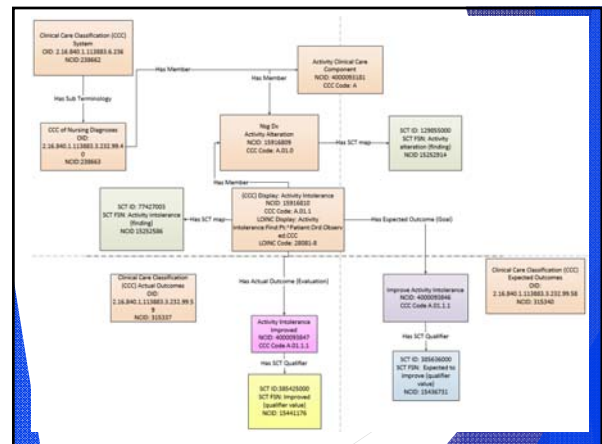


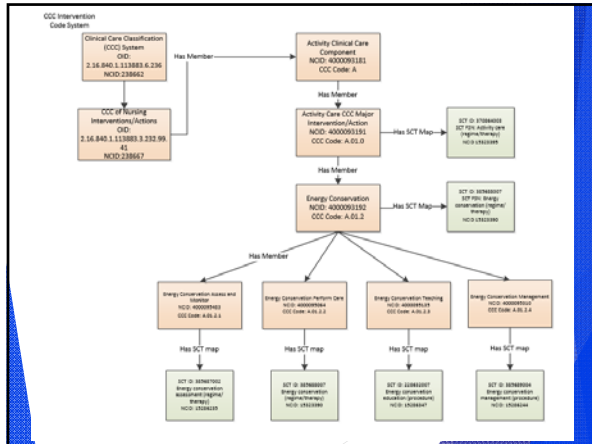
- ▶ CCC concepts are in LOINC



## Design Phase

- ▶ Designed model for loading into terminology server
- ▶ Create 4 sub code systems under CCC
  - ▶ Created local OIDs and related sub-code system to the CCC code system
    - ▶ CCC of Nursing Diagnoses
    - ▶ CCC of Nursing Interventions/Actions
    - ▶ Clinical Care Classification (CCC) Actual Outcomes
    - ▶ Clinical Care Classification (CCC) Expected Outcomes
- ▶ Created relationships for hierarchy
  - ▶ Example - CCC Diagnoses to Actual Outcomes Map Relationship
- ▶ Created relationships for mapsets
  - ▶ Example - CCC to SNOMED CT Map Relationship





## Conclusion

- ▶ When implementing any terminology you must evaluate and understand it's use and meaning
- ▶ Mapsets are useful between terminologies
- ▶ A terminology server can aid in implementation
- ▶ Future steps to create specific APIs for end user needs

