

National Committee on Vital and Health Statistics (NCVHS)

Consolidated Health Informatics (CHI) Update

October 11, 2006



U.S. Department of Health and Human Services
Office of the National Coordinator
for Health Information Technology



Federal Health Architecture
ROADMAP FOR FEDERAL HEALTH

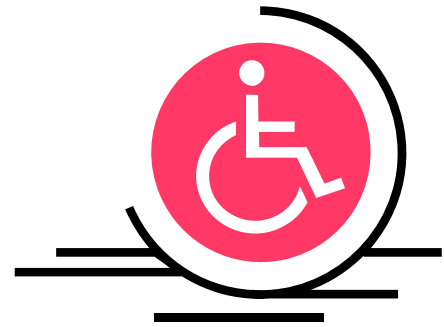


Agenda

- **Standards Work Groups Update**
 - CHI Disability Recommendation
- **Questions**



- **Disability Recommendation**
 - **Participants**
 - **Scope**
 - **Background**
 - **Recommendation Process and Endorsement Dates**
 - **Standards Adoption Recommendation**
 - ❖ **LOINC**
 - ❖ **ICF / SNOMED and CHI endorsed vocabularies**
 - ❖ **HL7 Messaging**
 - **Recommendation**
 - ❖ **Conditions**
 - ❖ **Benefits**
 - ❖ **Considerations**





CHI Disability Work Group Participants

● Disability Work Group

– Participants:

❖ **Co Chairs:** Dr. Laurence Desi, SSA
Jennie Harvell, ASPE

❖ **Members:** HHS - ASPE, CMS, NLM, CDC, IHS
SSA
RRB
VA - VHA, VBA
DOD
DOL
DOS



– Scope

- ❖ **Functioning and Disability Content and related Assessment Instruments**

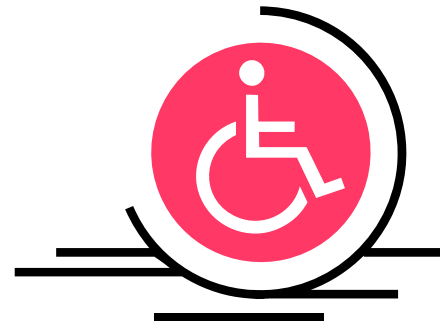
– Background

❖ **Builds on CHI Phase I:**

- » Gaps in domain vocabularies (ICF and SNOMED)
- » NCVHS recommended considering standardizing with:
 - LOINC
 - Semantics terminology

❖ **Leverages and Analysis:**

- » ASPE/CMS MDS Standardization Project
- » Clinical LOINC RFC efforts
- » Work Group Use Case analysis
- » ICF/SNOMED pilot mapping

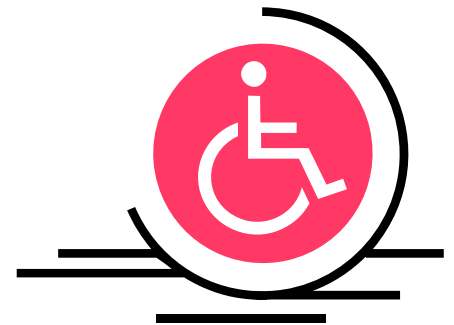




Recommendation Process

– Recommendation Process and Endorsement Dates

- ❖ **Conducted recommended analysis and developed the Functioning and Disability Standard Adoption Recommendation Report 7-2005 through 9-2006**
- ❖ **Presented the Recommendations Report to CHI on 9-6-06**
- ❖ **Report vetting through CHI federal agencies**
 - » **Motion to endorse and send the Recommendation Report to NCVHS on 10-4-06**
 - » **Distribute Report to NCVHS SSS on 10-5-06**
- ❖ **Present Recommendation to NCVHS SSS 10-11-06**



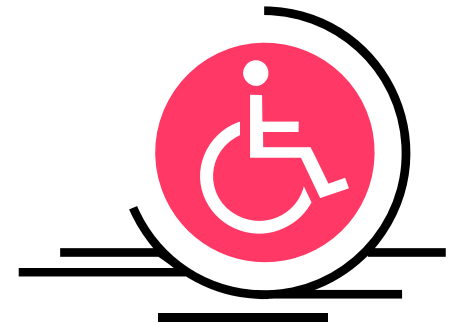


CHI Functioning and Disability Recommendation

– CHI Standard Adoption Recommendation*:

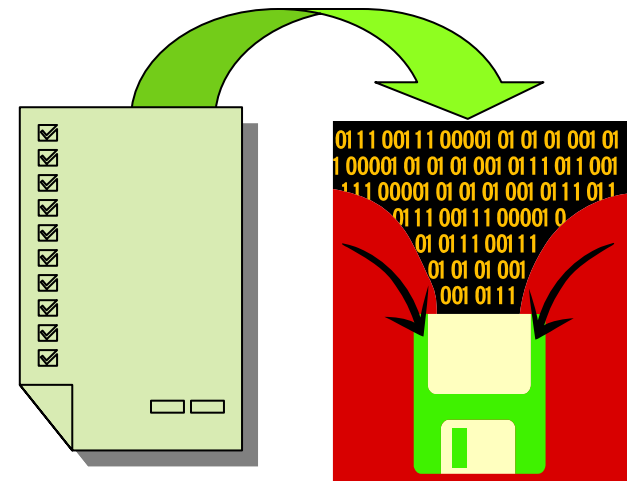
1. LOINC for Question and Answer “format”
2. CHI-endorsed vocabularies for exact and “usefully-related” content (e.g., SNOMED)
 - Identify ICF as a CHI endorsed vocabulary standard for disability content, include ICF in UMLS, and create mappings between SNOMED and ICF
3. HL7 for “Exchange”

* **Conditional Recommendation**



LOINC Components

- **LOINC- for representation of 'Questions and Answers'**
 - Detail ASPE/CMS funded study
 - Study Results: <http://aspe.hhs.gov/daltcp/reports/2006/MDS-HIT.htm>
 - LOINC-ified Assessments
 - ❖ MDS
 - ❖ RFC
 - ❖ Others not included in CHI Report
- **LOINC Components**
 - Single LOINC code to name Panel, plus
 - Required Elements
 - ❖ Component, Property, Timing, System, Scale, Method
 - Optional Elements
 - ❖ Class, Survey Question Source, Survey Question Text, Answer List, Formula, Comments, Context





MDS Manual Form

Numeric Identifier _____

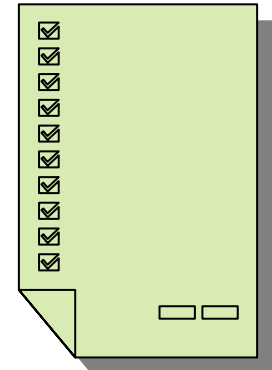
MINIMUM DATA SET (MDS) — VERSION 2.0 FOR NURSING HOME RESIDENT ASSESSMENT AND CARE SCREENING

BASIC ASSESSMENT TRACKING FORM

SECTION AA. IDENTIFICATION INFORMATION

1. RESIDENT NAME®																																																				
	a. (First)	b. (Middle Initial)	c. (Last)	d. (Jr/Sr)																																																
2. GENDER®	1. Male 2. Female																																																			
3. BIRTHDATE®	<table border="1"> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> <tr> <td colspan="2">Month</td> <td colspan="2">Day</td> <td colspan="4">Year</td> </tr> </table>												Month		Day		Year																																			
Month		Day		Year																																																
4. RACE/ETHNICITY®	<table border="1"> <tr> <td>1. American Indian/Alaskan Native</td> <td>4. Hispanic</td> </tr> <tr> <td>2. Asian/Pacific Islander</td> <td>5. White, not of Hispanic origin</td> </tr> <tr> <td>3. Black, not of Hispanic origin</td> <td></td> </tr> </table>				1. American Indian/Alaskan Native	4. Hispanic	2. Asian/Pacific Islander	5. White, not of Hispanic origin	3. Black, not of Hispanic origin																																											
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5. SOCIAL SECURITY® AND MEDICARE NUMBERS® [C in 1 st box if non med. no.]	<table border="1"> <tr> <td colspan="9">a. Social Security Number</td> </tr> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> <tr> <td colspan="9">b. Medicare number (or comparable railroad insurance number)</td> </tr> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> </table>				a. Social Security Number																		b. Medicare number (or comparable railroad insurance number)																													
a. Social Security Number																																																				
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6. FACILITY PROVIDER NO.®	<table border="1"> <tr> <td colspan="12">a. State No.</td> </tr> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> <tr> <td colspan="12">b. Federal No.</td> </tr> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> </table>				a. State No.																								b. Federal No.																							
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7. MEDICAID NO. ["+" if pending, "N" if not a Medicaid recipient]®	<table border="1"> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> </table>																																																			
8. REASONS FOR ASSESSMENT	<p>[Note—Other codes do not apply to this form]</p> <p>a. Primary reason for assessment</p> <ol style="list-style-type: none"> 1. Admission assessment (required by day 14) 2. Annual assessment 3. Significant change in status assessment 4. Significant correction of prior full assessment 5. Quarterly review assessment 10. Significant correction of prior quarterly assessment 0. NONE OF ABOVE <p>b. Codes for assessments required for Medicare PPS or the State</p> <ol style="list-style-type: none"> 1. Medicare 5 day assessment 2. Medicare 30 day assessment 3. Medicare 60 day assessment 4. Medicare 90 day assessment 5. Medicare readmission/return assessment 6. Other state required assessment 7. Medicare 14 day assessment 8. Other Medicare required assessment 																																																			

9. Signatures of Persons who Completed a Portion of the Accompanying Assessment or Tracking Form		
I certify that the accompanying information accurately reflects resident assessment or tracking information for this resident and that I collected or coordinated collection of this information on the dates specified. To the best of my knowledge, this information was collected in accordance with applicable Medicare and Medicaid requirements. I understand that this information is used as a basis for ensuring that residents receive appropriate and quality care, and as a basis for payment from federal funds. I further understand that payment of such federal funds and continued participation in the government-funded health care programs is conditioned on the accuracy and truthfulness of this information, and that I may be personally subject to or may subject my organization to substantial criminal, civil, and/or administrative penalties for submitting false information. I also certify that I am authorized to submit this information by this facility on its behalf.		
Signature and Title	Sections	Date
a.		
b.		
c.		
d.		
e.		
f.		
g.		
h.		
i.		
j.		
k.		
l.		





MDS LOINC Representation

45981-8 MDS FULL ASSESSMENT FORM: -: PT: ^PATIENT: -:

NAME

Component

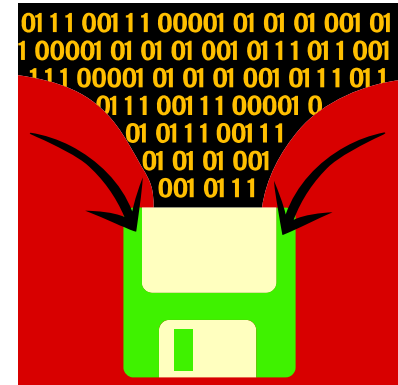
MDS FULL ASSESSMENT FORM - PT ^PATIENT -

BASIC PROPERTIES

Class/Type: PANEL.SURVEY.MDS/Survey

Order vs. Obs.: ORDER

Units Required: N



PANEL CHILDREN

LOINC Component Property Time System Scale Method R/O Datatype Submitters Code

45981-8 MDS FULL ASSESSMENT FORM - PT ^PATIENT -

45982-6 IDENTIFICATION AND BACKGROUND INFORMATION SECTION- PT ^PATIENT -

45965-1 NAME - PT ^PATIENT SET

45394-4 LAST NAME PN PT ^PATIENT NOM TX AA1c

45395-1 NAME SUFFIX PN PT ^PATIENT NOM TX AA1d

45392-8 FIRST NAME PN PT ^PATIENT NOM TX AA1a

45393-6 MIDDLE INITIAL ID PT ^PATIENT NOM MDS TX AA1b

45403-3 ROOM NUMBER LOC PT ^PATIENT NOM TX A2

45983-4 ASSESSMENT REFERENCE DATE - PT ^PATIENT SET

45453-8 DATE OF LAST DAY OF OBSERVATION PERIOD TMSTP PT ^PATIENT QN MDS DT A3a

45454-6 ORIGINAL OR CORRECTED COPY OF FORM NUM PT ^PATIENT ORD MDS NM A3b



Physical RFC Form Section

A. EXERTIONAL LIMITATIONS

None established. (Proceed to section B.)

1. **Occasionally lift and/or carry (including upward pulling)**
(maximum)—when less than one-third of the time or less than 10 pounds, explain the amount (time/pounds) in item 6.

- less than 10 pounds
- 10 pounds
- 20 pounds
- 50 pounds
- 100 pounds or more

2. **Frequently lift and/or carry (including upward pulling)**
(maximum)—when less than two-thirds of the time or less than 10 pounds, explain the amount (time/pounds) in item 6.

- less than 10 pounds
- 10 pounds
- 25 pounds
- 50 pounds or more



RFC LOINC Representation

46643-3 EXERTIONAL LIMITATIONS - PT ^PATIENT SET RFC ASSESSMENT

46644-1 NO EXERTIONAL LIMITATIONS ARB PT ^PATIENT ORD RFC ASSESSMENT

46645-8 OCCASIONALLY LIFT &OR CARRY FIND PT ^PATIENT ORD RFC ASSESSMENT

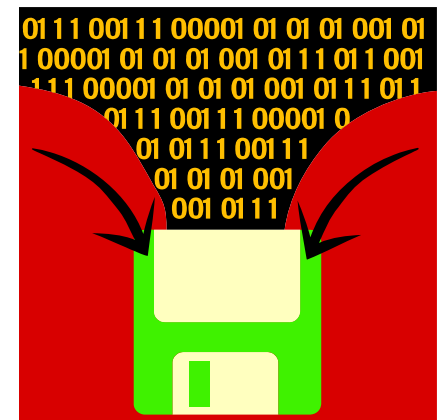
ANSWER LIST: Physical RFC Exertional Limitations / Physical RFC A-1

SEQ#	Answer Global ID Code System
0	100 pounds or more 5
1	less than 10 pounds 1
2	10 pounds 2
3	20 pounds
4	50 pounds

46646-6 FREQUENTLY LIFT &OR CARRY FIND PT ^PATIENT ORD RFC ASSESSMENT

ANSWER LIST: Physical RFC Exertional Limitations / Physical RFC A-2

SEQ#	Answer Global ID Code System
1	less than 10 pounds 1
2	10 pounds 2
3	25 pounds 3
4	50 pounds or more 4



Detail RFC LOINC Report is found in Appendix C

Disability and Functioning Vocabularies

- **SNOMED**

- Granular level concepts
- Clinical coverage
- Gaps and overlaps

- **ICF**

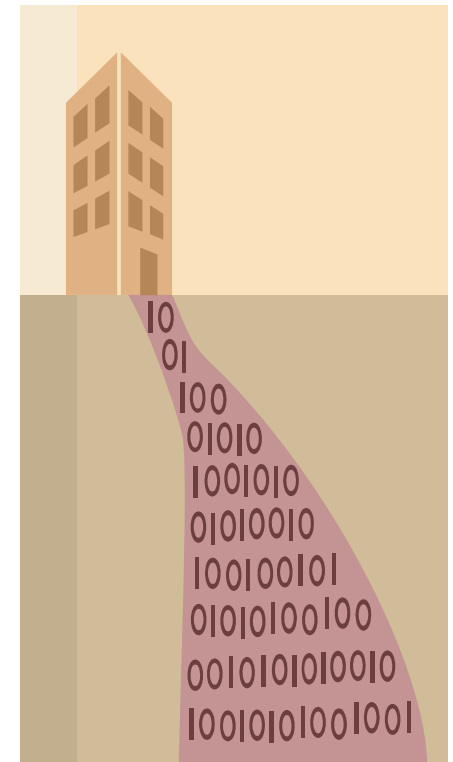
- Higher level concepts
- Benefits and administrative coverage
- Fills some gaps, other gaps and overlaps

- **Federal Partner Concept Assessment**

- SSA Survey and Assessment
- Survey Concept Summary Results **Appendix D**

- **Recommendation**

- Incorporate ICF into the UMLS
- Develop Mappings to enhance overall coverage of the functioning and disability domain
- Pilot Mappings on RFC Use Case **Appendix B**





RFC ICF and SNOMED Mapping

This Spreadsheet demonstrates a proposed ICF-SNOMED Mapping Diagram based on the SSA Residual Physical Functional Capacity Assessment form (RFC) . Red text in cells represents NCHS entries. Green text in cells represents Dr. Laurence Desi's original text from his July 27, 2006 prototype spreadsheet. Blue text in cells represents a synonym match with the RFC Limitation Type.

RFC Limitation Category	Concept: RFC Limitation Type	ICF Domain and Chapter	ICF Code	ICF Code Short Title	ICF Code Prose Text	UMLS ID	SNOMED-CT Code(s)	SNOMED-CT Explanation
PHYSICAL RESIDUAL FUNCTIONAL CAPACITY ASSESSMENT								
Exertional Limitations	Lifting	Activities & Participation Ch. 4: Mobility	d430	Lifting and carrying objects	Raising up an object or taking Something from one place to another, such as when lifting a cup	C0565671	288330002	Ability to lift (F)
		Activities & Participation Ch. 4: Mobility	d430	Lifting	Raising up an object in order to move it from a lower to a higher level, such as when lifting a glass	C0565676	288335007	Difficulty lifting (F)
		Activities & Participation Ch. 4: Mobility	d4308	Lifting and carrying, other specified	Same as Short Title	C0206244	258141001 (258141001)	Lifting, function (OE)
		Activities & Participation Ch. 4: Mobility	d4309	Lifting and carrying, unspecified	Same as Short Title	C0418139	218220002	Overexertion from lifting (F)

ICF KEY:

b = Body Functions
 s = Body Structures
 d = Activities & Participation
 e = Environmental Factors

SNOMED-CT KEY:

A = Attribute
 F = Finding
 OE = Observable Entity
 PF = Physical Force
 PO = Physical Object
 QV = Qualifier Value
 S = Substance



CHI Endorsed Vocabularies

CHI Terminology Groupings & Examples of Correlating Items from MDSv2

CHI Category	An Example MDSv2 section is...	CHI- recommended terminology & terminology examined in this project
Resident Anatomy	J3 “pain site” (also embedded throughout the MDSv2)	SNOMED-CT
Laboratory Result Names	I2 “Infections”: does not explicitly reference lab tests, but provides an example where HIT may use them (HIV, Hepatitis, STDs, UTI)	LOINC
Laboratory Result Contents	I2 “Infections”: does not explicitly reference lab tests, but provides an example where HIT may use them (HIV, Hepatitis, STDs, UTI)	SNOMED-CT
Resident Demographics	- AA, “Identification Information” (race/ethnicity, gender) -AB “Demographics Information” (language)	HL7v2.4
Diagnosis/Problem List Entries	I1, I3, Diseases/Other Diagnoses (e.g., asthma, depression, diabetes)	SNOMED-CT (CHI-recommended); ICD-9 (supplemental analysis)
Non-laboratory Interv and Procedures	Section P: “Special treatments and procedures” (Occupational Therapy, Physical Therapy, medical or nursing procedures (suctioning, ostomy, dialysis, medical evaluation))	SNOMED-CT
Immunizations	NA	HL7v2.3.1+
Units of Measure	Section K6: “Parenteral or Enteral Intake” (e.g., total calories consumed, and average fluid intake (measured in cc’s))	HL7v2.x+
Laboratory Test Names	NA	LOINC
Medications (Clin Drug)	NA	RxNorm SCD
Drug Classifications	O4: “Days received the following medication” (e.g., antidepressant, antipsychotic, diuretic)	NDF-RT
Drug Dose Form	NA	FDA/CDER tables
Medication Ingredients	NA	FDA Established Name/UNII Code
Medication Package	NA	FDA/CDER
Drug Product	NA	FDA National Drug Codes
Nursing Terms	Found throughout the MDS. Including Section V, “Rap problem area” (e.g., falls, communication, psychosocial well-being); J2b.2, “Moderate Pain”	SNOMED-CT

HL7 Messaging Recommendation

- **Support the transmission of the Functioning and Disability and related Assessment Data**
 - **HL7 Messages**
 - ❖ **OBR/OBX**
 - **HL7 CDA**
 - ❖ **Human readable**
 - ❖ **Machine readable**





HL7 Messaging: Can Send LOINC and associated SNOMED/ICF/CHI Codes

Field	Meaning	Example
OBR-4	[Optional]: LOINC Code for Instrument / Panel (allows sending of multiple responses)	xxxx-x^Nursing Home Minimum Data Set - MDS2_0v1_3^LN
OBX-3	LOINC code for item + alternate codes	OBX 3 CE xxxx-x^B4^LN^xxx^Ability to make decisions (observable entity)^SNM
OBX-5	Response, allowing for alternate coding systems	OBX 5 CE 2^MODERATELY IMPAIRED-decisions poor, cues/supervision required^L^xxx^Difficulty using decision making strategies (finding)^SNM
OBX-3	LOINC code for item + alternate codes	OBX 3 CE xxxx-x^AC1a^LN
OBX-5	Response, allowing for alternate coding systems	OBX 5 CE 1^Yes^L^xxx^Yes (qualifier value)^SNM



HL7 CDA XML Coding (machine readable)

```
<section>
<caption>
<caption_cd V="11496-7" S="2.16.840.1.113883.6.1"/>Assessment
</caption>
<list>
<item>
<content>
<content ID="String001">Asthma</content>, with prior smoking
history. Difficulty weaning off steroids. Will try gradual taper.
<coded_entry>
<coded_entry.value ORIGTXT="String001"
V="D2-51000" S="2.16.840.1.113883.6.5"/>
</coded_entry>
</content>
</item>
<item><content>Hypertension, well-controlled.</content></item>
<item><content>Contact dermatitis on finger.</content></item>
</list>
</section>
```

- The HL7 Clinical Data Architecture (CDA) allows for both human readable (text based document) and machine readable documents. The machine readable version is a document markup standard that specifies the structure and semantics of clinical documents for exchange purposes. It subdivides documents into meaningful, tagged chunks of information and provides a template for structuring computably-valid instances of a clinical document.
- The above CDA example,, illustrates concept coding in a CDA document. A sample problem-oriented medical record section has a <caption_cd> element, which provides the LOINC code (**V=code value S=coding system ID**) for the <caption> element value "Assessment". The Assessment record consists of a <list> of three <item> elements, but only the first has coded <content>. A <coded_entry> element provides the **SNOMED International code for "Asthma"**, text marked up by the previous <content> element which assigned it an internal ID="String001"
- The <body> of a CDA document consists of nested <section>, <paragraph>, <list>, <item>, <table> and/or other XML markup elements, as specified by a formal CDA document type description (DTD) developed by HL7. <content> and <coded_entry> elements can be used to markup and encode clinical content from a variety of domains. The **<coded_entry> element inserts codes from HL7-recognized coding schemes into CDA documents**. A <coded_entry.value> element can explicitly reference the original text within the document that is being encoded.
- Vocabulary domains provide the value sets for CDA-required coded attributes, as well as optional <coded_entry> elements. Value sets can be **HL7-specified concepts or defined subsets of recognized external coding systems such as LOINC or SNOMED-CT**. HL7 assigns a unique identifier to each vocabulary domain, and every concept within such a domain must have a unique code.



Recommendation Conditions

– Recommendation Conditions

- ❖ The Federal Government should address the issue of how to most efficiently gain access to needed ***web-based collaboration tools*** to identify “usefully-related” standardized assessment content.
- ❖ The NLM workgroup needs to address and resolve issues related to creating a ***knowledge-base in the UMLS Metathesaurus*** to (i) represent information on assessment forms that is constant (i.e., the questions and answer options) and (ii) link this constant information with usefully-related and exact matching vocabulary content.
- ❖ The National Library of Medicine and the World Health Organization need to complete their negotiations on the conditions under which ***ICF will be incorporated into the UMLS***.

Note: As federal agencies deploy these recommendations in standardizing patient/client assessment instruments and other functioning and disability content, pilot testing may be needed regarding the use of (i) LOINC to represent patient/client assessments, (ii) matching to CHI-endorsed semantic terms, and (iii) HL7 messaging to transmit such standardized assessments.

Recommendation Benefits

– Recommendation Benefits:

- ❖ Enhances the functional and disability domain vocabulary coverage
- ❖ Blends the use of existing standards (i.e., content and format) to enable the exchange of functioning and disability information and reuse of assessment content
- ❖ Supports the implementation of standards to improve interoperable disability and functioning information and assessments exchange
- ❖ Provides a UMLS database to link LOINC and identified content standards from various sources (e.g., SNOMED, ICF, etc.)
- ❖ Enables needed analyses (e.g., of questions, answers, and functioning and disability terms within and across instruments and federal agencies)

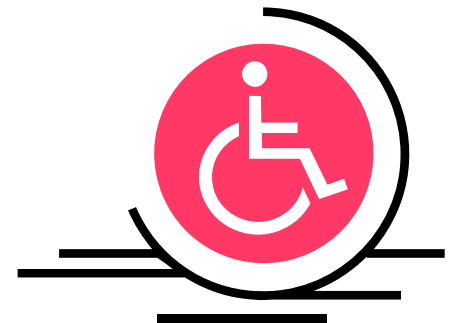




Future Considerations

– Future Considerations

- ❖ **Pilot testing of implementation programs required for assessments to link standards with assessment content and format, and disseminate these linkages**
- ❖ **Participate in Clinical LOINC Committee**
- ❖ **Federal software modification to support standardization**
- ❖ **Conduct outreach including interactions with the SDOs and create a Use Case for AHIC and HITSP consideration.**



Questions?



U.S. Department of Health and Human Services
Office of the National Coordinator
for Health Information Technology



Federal Health Architecture
ROADMAP FOR FEDERAL HEALTH