A Framework for Sharing Nursing Data: The Quality Jackpot

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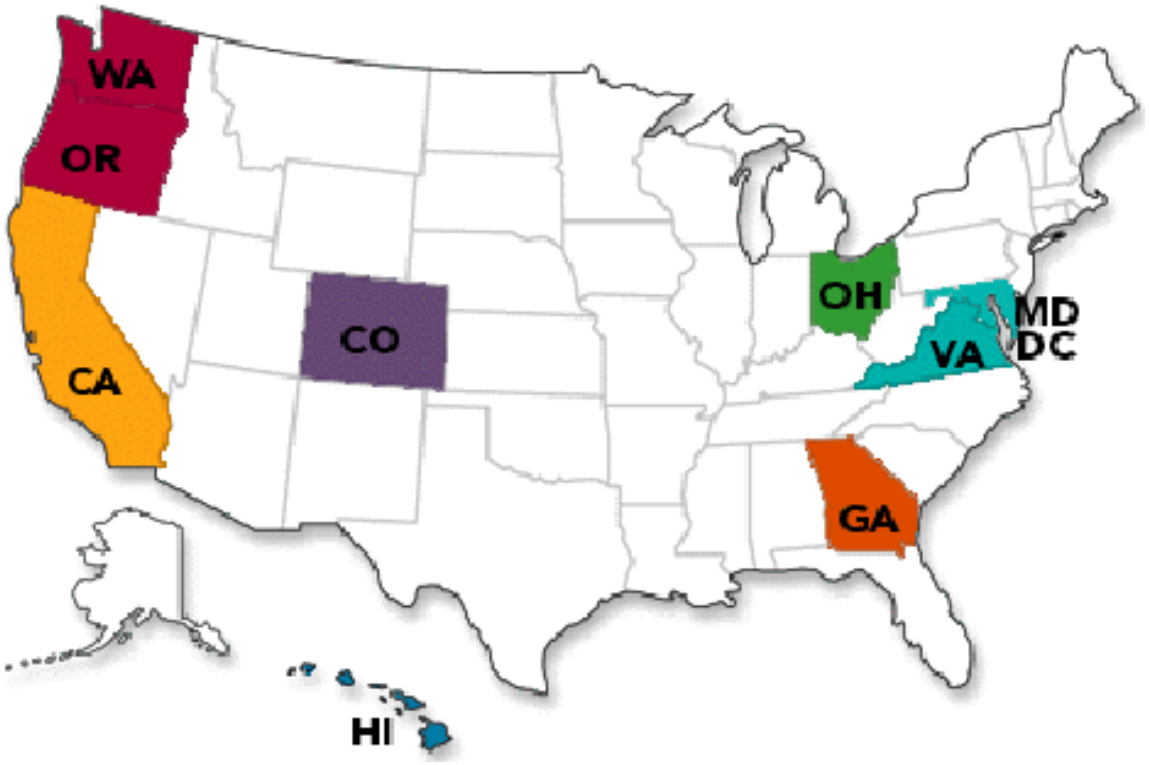
Kaiser Permanente (KP)



- Integrated health care delivery system
- 8.8 million members
- 16,000+ physicians
- 46, 000+ nurses
- 170,000+ employees
- 36 hospitals
- 568 medical offices
- 44 billion annual revenues

Comprehensive Tool

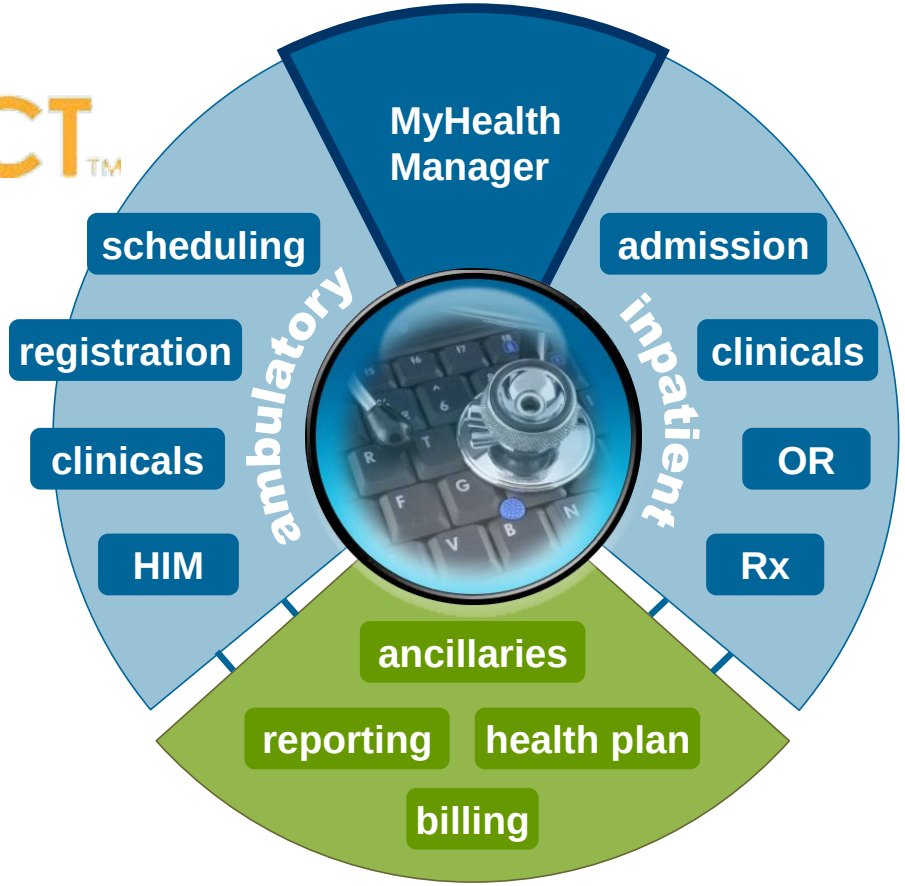
KAISER PERMANENTE
HEALTHCONNECT™

Not just an electronic medical record

Program-wide system integrates clinical record appointments, registration, ancillaries, health plan

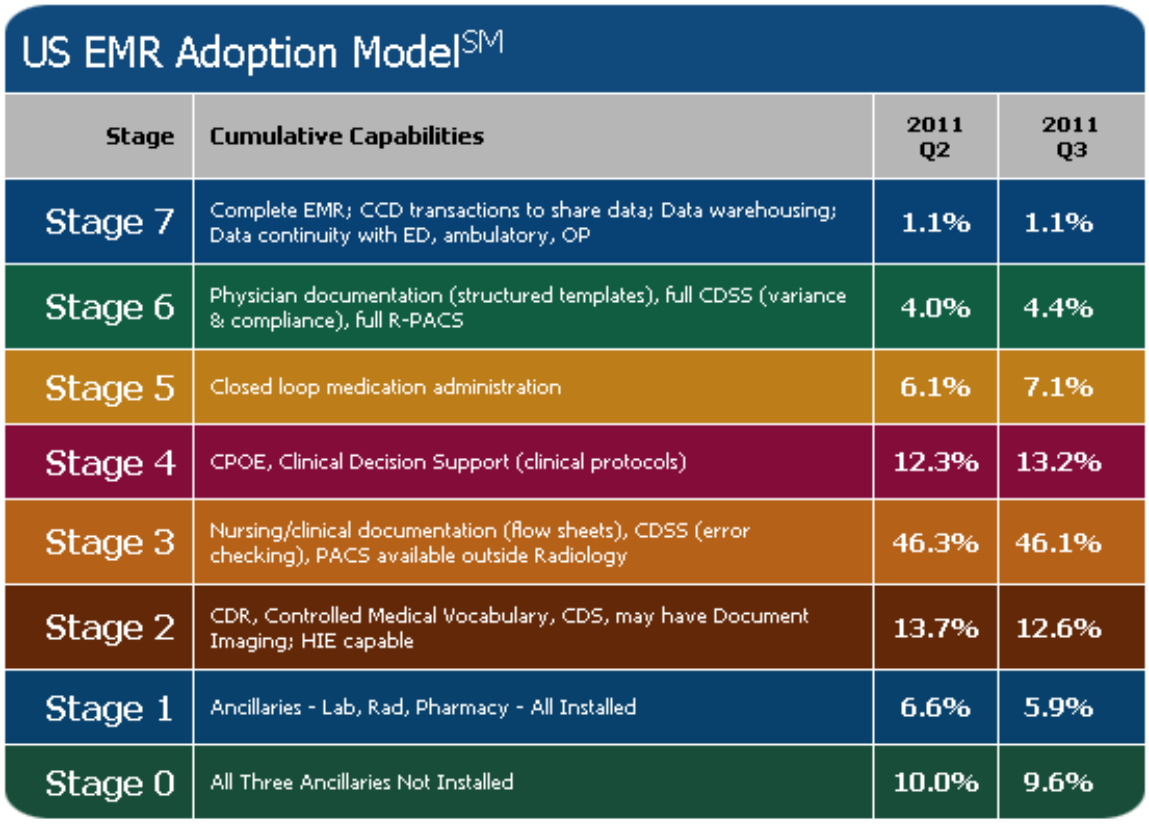
Highly-sophisticated information management and delivery system

Member access to health information and outcomes



Acronym Key:
HIM - Health Information Management
OR – Operating Room
RX – Pharmacy/Prescription

Sweeping the Stage



US EMR Adoption Model[SM]			
Stage	Cumulative Capabilities	2011 Q2	2011 Q3
Stage 7	Complete EMR; CCD transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP	1.1%	1.1%
Stage 6	Physician documentation (structured templates), full CDSS (variance & compliance), full R-PACS	4.0%	4.4%
Stage 5	Closed loop medication administration	6.1%	7.1%
Stage 4	CPOE, Clinical Decision Support (clinical protocols)	12.3%	13.2%
Stage 3	Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	46.3%	46.1%
Stage 2	CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable	13.7%	12.6%
Stage 1	Ancillaries - Lab, Rad, Pharmacy - All Installed	6.6%	5.9%
Stage 0	All Three Ancillaries Not Installed	10.0%	9.6%
Data from HIMSS Analytics™ Database © 2011		N = 5,310	N = 5,299

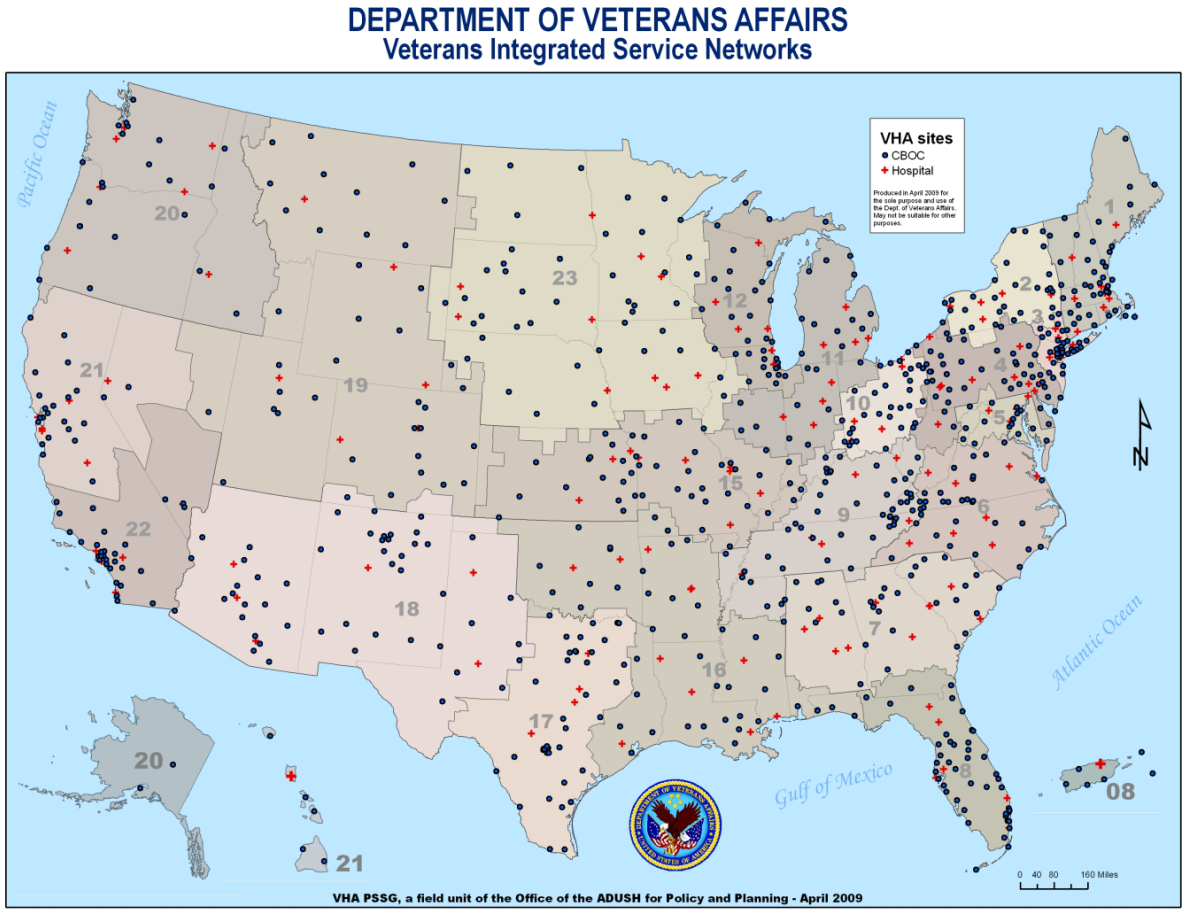
At the end of 2011 only 1.1% of U.S. hospitals had Electronic Health Records (EHR) at “Stage 7”

100% of Kaiser Permanente Hospitals (36) have achieved “Stage 7” recognition

More than any other health care system in the U.S.

Acronym Key:
CCD – Continuity of Care Document
CDR – Clinical Data Repository
CDS – Clinical Data Services
CDSS – Clinical Decision Support System
CPOE – Computerized Physician Order Entry
ED – Emergency Department
EMR – Electronic Medical Record
HIE – Health Information Exchange
HIMSS - Healthcare Information and Management Systems Society
OP – Outpatient Pharmacy
R-PACS – Radiology Picture Archiving and Communications System

Veterans Heath Administration (VHA) Network



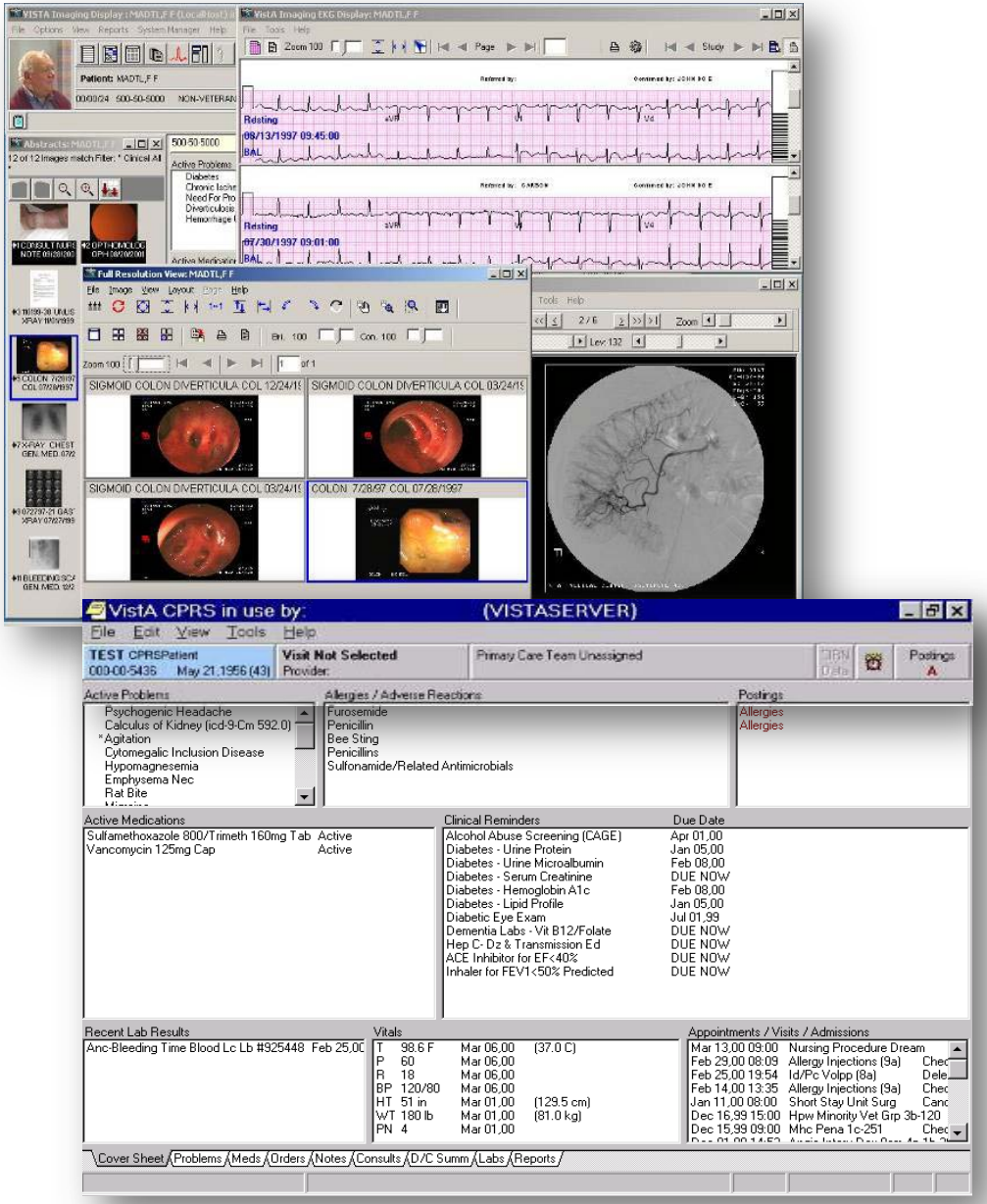
- Largest Integrated Health Care Delivery System
- 8.45 million enrollees
- 254,000 Employees
- 19,000 Physicians
- 70,000 Nurses
- 21 Regions
- 152 Hospitals & Medical Centers
- 802 Community Based Outpatient Clinics
- 293 Veteran Centers
- 133 Community Living Centers

Sources:
http://www.va.gov/vetdata/docs/Quickfacts/4x6_fall_11_sharepoint_Final.pdf
http://www.va.gov/vetdata/docs/Quickfacts/Homepage_slideshow_FINAL.pdf
http://www.va.gov/vetdata/docs/Quickfacts/4x6_fall_11_sharepoint_Final.pdf

VistA*

VistA includes many components to deliver high-quality health care to our Nation's Veterans:

- Computerized Patient Record System (CPRS)
- Bar Code Medication Administration (BCRO)
- Personal Health Record, My Health***e***Vet
- Used throughout the VA health care system:
  - Inpatient
  - Outpatient
  - Long-term care
  - Home care
  - Telemedicine



*VistA = Veterans Health Information Systems and Technology Architecture Imaging

Objectives

- Describe how nursing data collected during patient care can be used for quality reporting, research & real time clinical decision support
- Describe a prototype mobile health application for collecting, displaying and reporting skin assessment data
- Describe a future vision where patient-centered data informs the development of information models and results in interoperability and improved care

Setting the Context

- Kaiser Permanente and the Veterans Health Administration are comparable in size and geographic area
- KP & VHA have been working on similar paths in Health Information Exchange (HIE) and standardized data models
- KP & VHA formalized the relationship with the Nationwide Health Information Network (NwHIN) – 2009 - 2010
- We initiated a nursing-led project in 2010 to define a standard information model driven by nursing practice that enables:
  - Data capture
  - Data re-use
  - Data sharing within and outside organizations.
  - Facilitates the measurement and extraction of data for meaningful EHR use to support quality, safety, efficiency and decision support.

**** Nursing can lead this area that can yield better information exchange and better quality outcomes**

A Nursing Information Model

1. Evaluate the Evidence
2. Leverage Clinical Expertise
3. Develop Optimum Data Sets
4. Harmonize the Data
5. Map to Reference Terminologies
6. Formalize the Model in UML
7. Link to HL7
8. Validate the Model

Outcomes of the KP-VA Collaborative

- Balloted a Domain Analysis Model (DAM) at Health Level 7 (HL7) in May 2011 with ballot reconciliation in September 2011
- Engaged with various professional organizations to support and extend this work
- Increased the direct involvement of nursing in establishing and enforcing data standards for EHR use
- Collaborated with the ANA to support the addition of *Pressure Ulcers* to the proposed list of Stage 2 and 3 meaningful use quality measures
- Enabled the increasingly visible role of nursing in Health Information Technology (HIT) committees

The Quality Concern

- The current state of quality reporting is very manual & labor intensive within and across organizations
- KP – VA Collaborative selected Pressure Ulcer Risk as a prototype
- As many as 3 million patients are treated in U.S. health care facilities each year for pressure ulcers*
- Annual cost of pressure ulcers is $3.2 billion**
- 60,000 patients die annually from pressure ulcer complications
- Most pressure ulcers are preventable
- Per standards of care, patients are assessed for pressure ulcer risk on admission and at prescribed intervals
- Quality data for pressure ulcers are already collected but reported in a variety of ways

* Dorner, Posthauer, & Thomas, 2009

** "The $17 Billion Problem" : Health Affairs April 2011

Current State:
VA Nursing Outcomes Database (VANOD)

- Nurses document skin assessments in structured format on national VANOD template in legacy system (CPRS)
- Template may be an additional tool depending on local documentation practices (double documentation)
- Populates retrospective quality reports
- Missed opportunity to impact care at the bedside

Admission Skin Assessment

```
Braden Scale - For Predicting Pressure Sore Risk
Sensory Perception:1 = Completely Limited
Moisture:          2 = Very Moist
Activity:          3 = Walks Occasionally
Mobility:          2 = Very Limited
Nutrition:         2 = Probably Inadequate
Friction:          1 = Problem
  10-12   High Risk
    Score:  11

CURRENT SKIN ASSESSMENT
    Skin Color:
      Color:  Flushed, Mottled
    Skin Temperature
      Temp:  Hot
    Skin Moisture
      Moisture:  Diaphoretic
    Skin Turgor
      Turgor:  Within normal limits

SKIN PROBLEMS
    PRESSURE ULCER ASSESSMENT
      Prior Pressure Ulcer Locations:
      PRESSURE ULCER STAGE
        STAGE II
                    Sacrum/coccyx
      Current pressure ulcer assessment
         no change in the ulcer
```

In the electronic health record, information is stored and displayed as text.

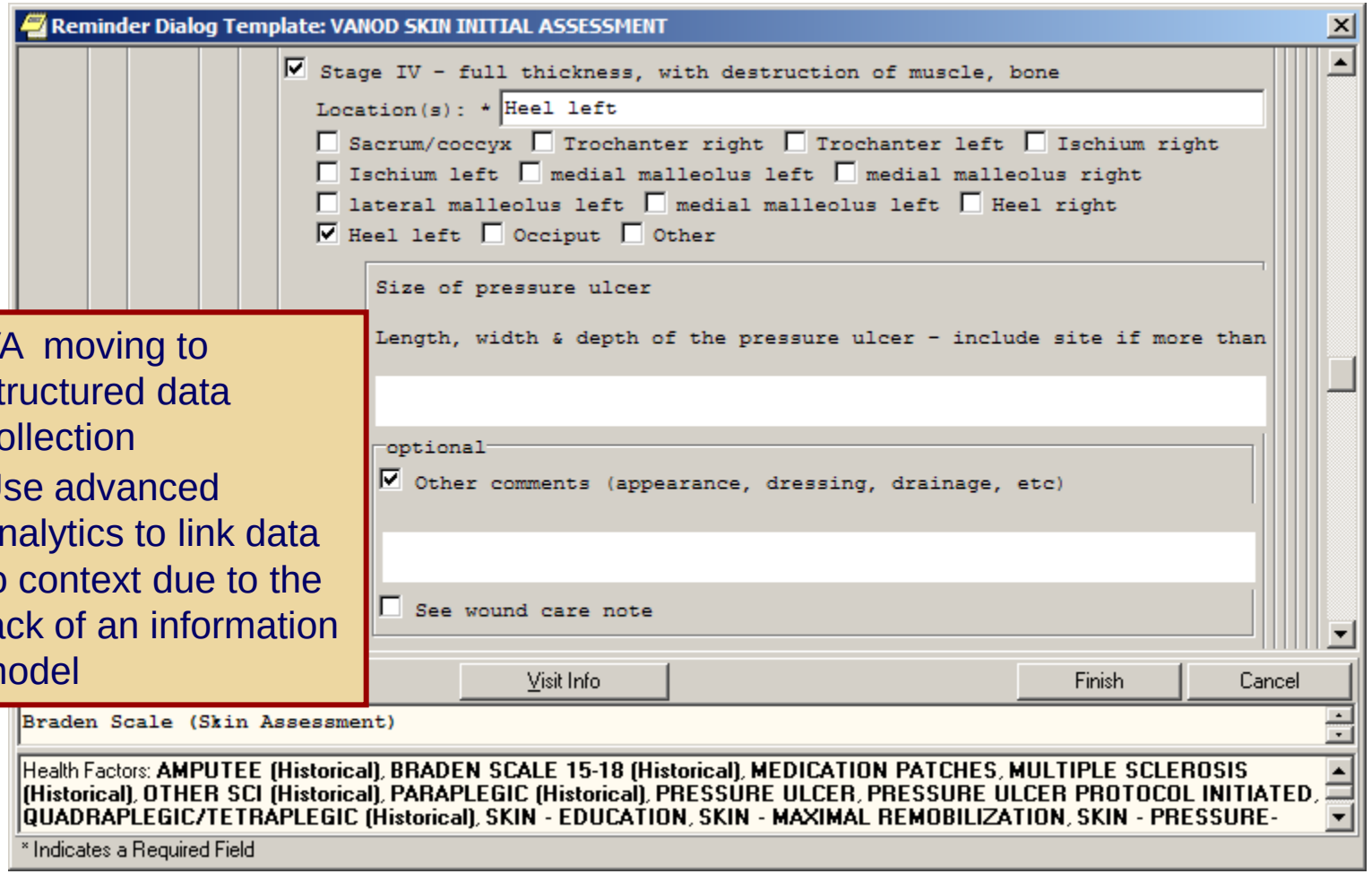
It is useful to the creator, once.

It is not computable.

It is extremely difficult to re-use

- **in a consultation note**
- **in a patient transfer summary**
- **in creating a care plan**

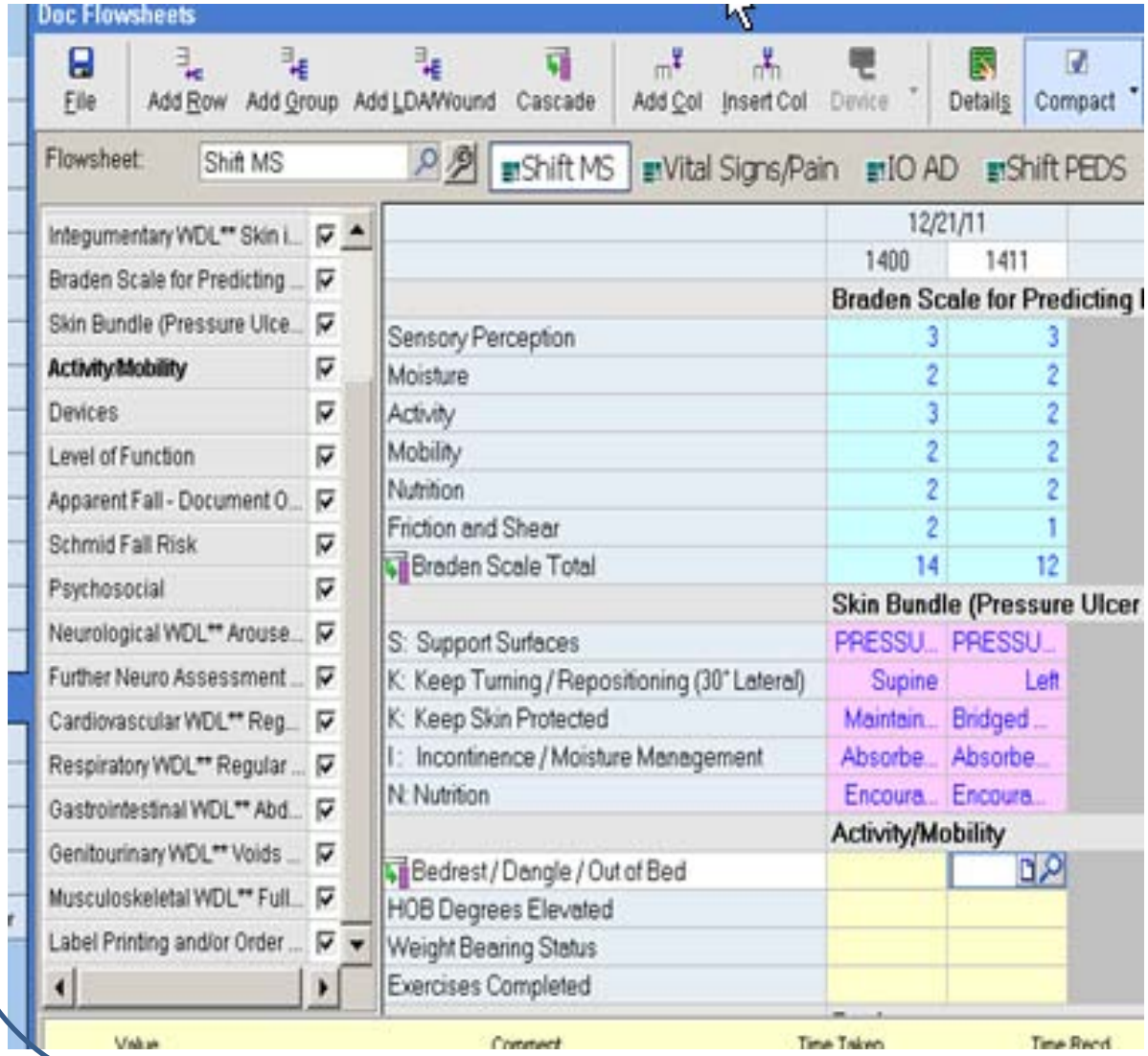
VA Current State



VA moving to structured data collection

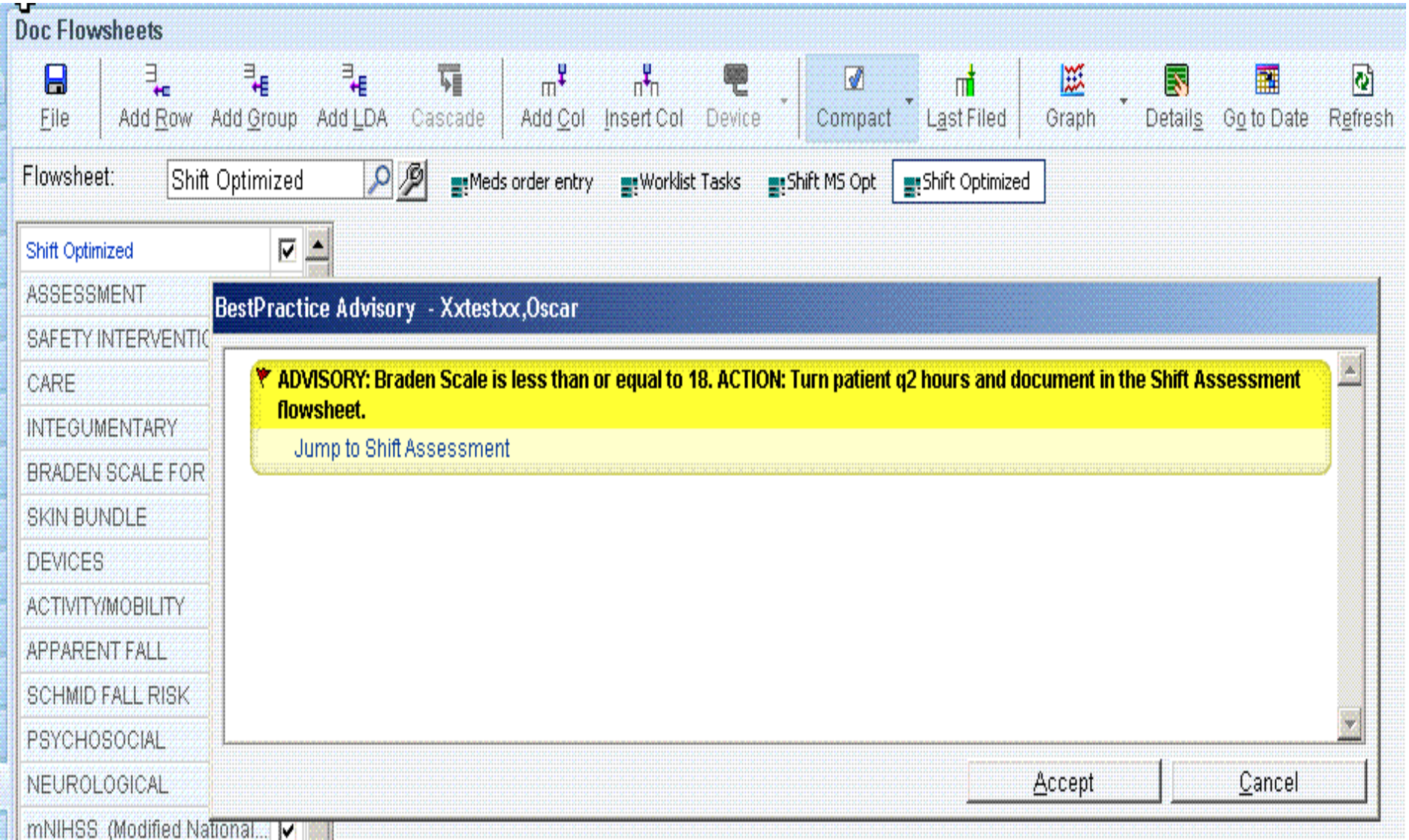
Use advanced analytics to link data to context due to the lack of an information model

KP Current State



- Nurses document in discrete fields
- Data is captured for reporting and data mining
- Limited by vendor's data structures and data model

Clinical Decision Support



Linking it All Together

- **Reference Terminologies** ensure conceptual equivalency – they define the "words"
  - Stage I left heel and Stage III right hip
  - Stage I right heel and Stage III left hip
  - Stage III left hip and Stage I right heel
  - Stage III right hip and Stage I left heel
- **Information Models** – describes the "full sentence" with meaning. The order of the words impact the meaning
- The context of this patient and the patient's story is still unknown with terminology alone

Desired Future State

- Documentation tools grounded in terminology and information models to be interoperable between:
  - Care settings and providers
  - Applications
  - Organizations
- EHRs that enable automatic extraction and reporting of quality data to enhance true interoperability and improved outcomes

American Nurses Association Recognition

- NANDA
- NIC
- NOC
- ABC Codes
- CCC
- OMAHA
- PNDS
- ICNP
- LOINC
- SNOMED CT

NANDA International
NANDA-I

ABC CODING SOLUTIONS
ALTERNATIVE LINK

CCC
SABACARE

Perioperative Patient Focused Model

LOINC®

The Omaha System
Solving the Clinical Data-Information Puzzle

INTERNATIONAL HEALTH TERMINOLOGY STANDARDS DEVELOPMENT ORGANISATION

The Quality Jackpot

- Development and adoption of an agreed upon data model that enhances the ability to share and compare information
- Transformation from nurses as the “human interface” between vendor applications to real time display of relevant information available at the point of care
- Utilization of common information models with new technology applications to improve care and reduce preventable adverse events

The Opportunity Is Now

- As health care providers, we have the opportunity to establish a leadership position with mobile health application vendors to build models in a collaborative, non-siloed manner.
- As nurses we have the opportunity to lead the way in developing clinical models that define our practice.
- To drive value, we need to build a set of detailed clinical models to promote interoperability and ease of use.
- In order to achieve interoperability, nurses should develop and adopt common data models, code sets, terminologies to promote interoperability.
- We need coherence in what the data means and how to get the data in and out of Electronic Health Records (EHRs).

Applications (Apps) from Other Industries

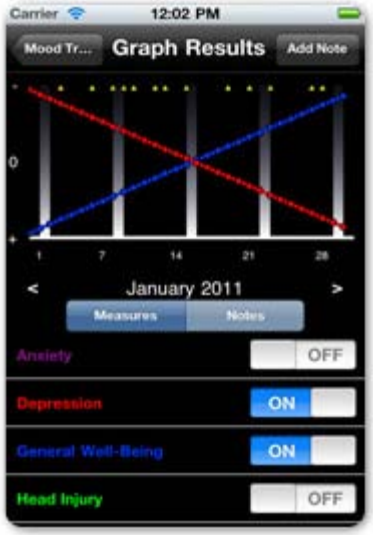
Smart Traveler

Science360

National Weather Service

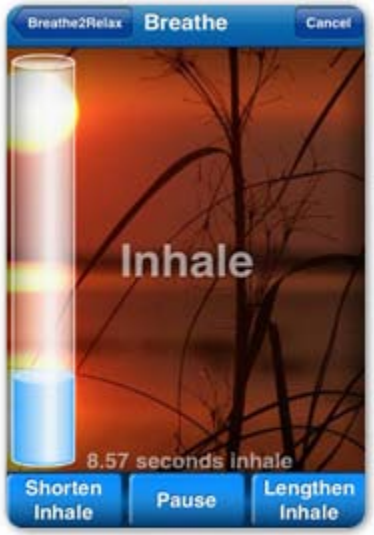
Apps in Health Care

T2 Mood Tracker

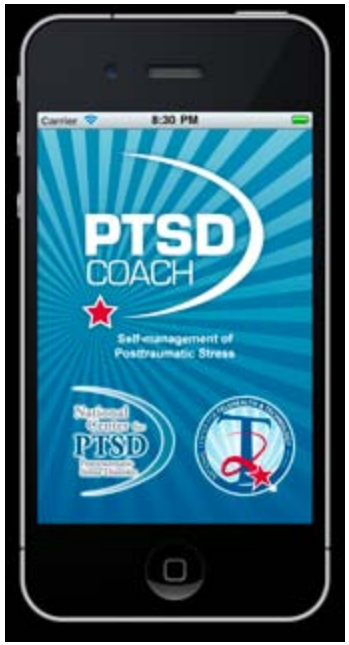


My Dietary Supplements (MyDS)

Breathe2Relax



VA Post-Traumatic Stress Disorder (PTSD) Mobile App



Skin Risk Assessment Prototype

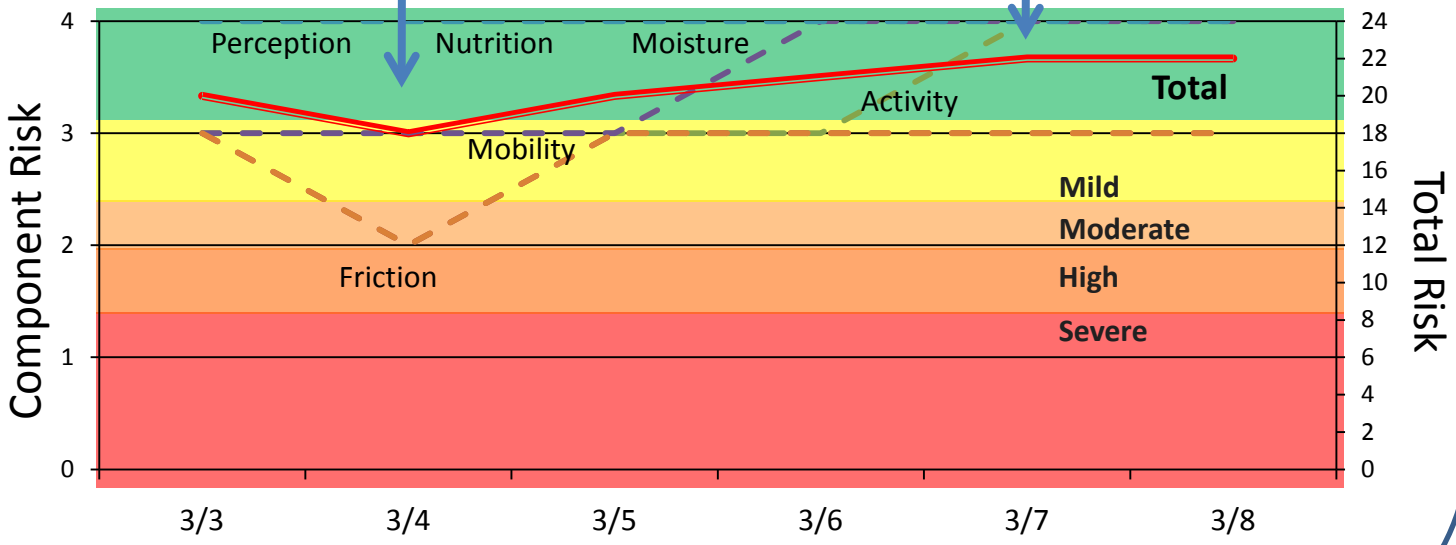
- Identify the scope: Skin risk assessment prototype within a mobile health “App”
    - Develop the common models and reference terminology to provide the framework
- Provide the infrastructure in which the open source community can work
  - Vendors can get off-the-shelf models and terminology that have been vetted by the clinical community
  - Identify a custodial agent who coordinates the open source community
  - Provide business requirements for building an “App” to be used by clinicians to assess risk of skin breakdown

Pressure Ulcer Risk

Score enters risk band: DSS prompts clinician for protocol

Prednisone ordered; DSS will not take action on low-risk patient

The view shows scores from multiple sources in one view



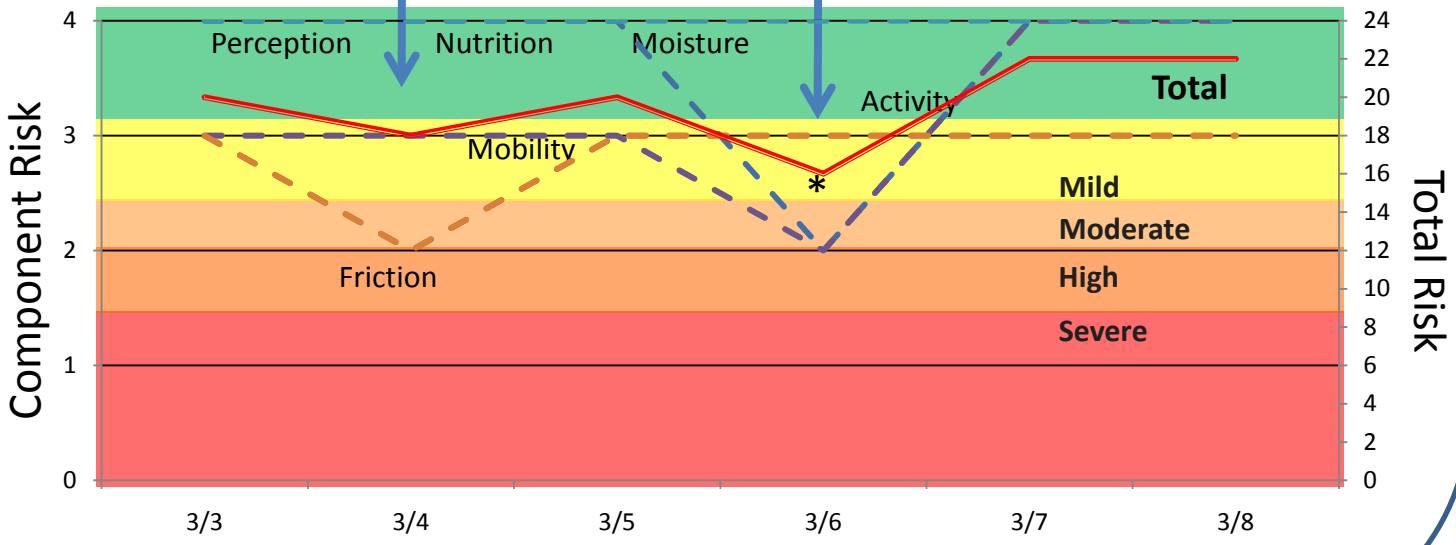
*DSS – Decision Support System

Pressure Ulcer Risk

Score enters risk band: DSS prompts clinician for protocol

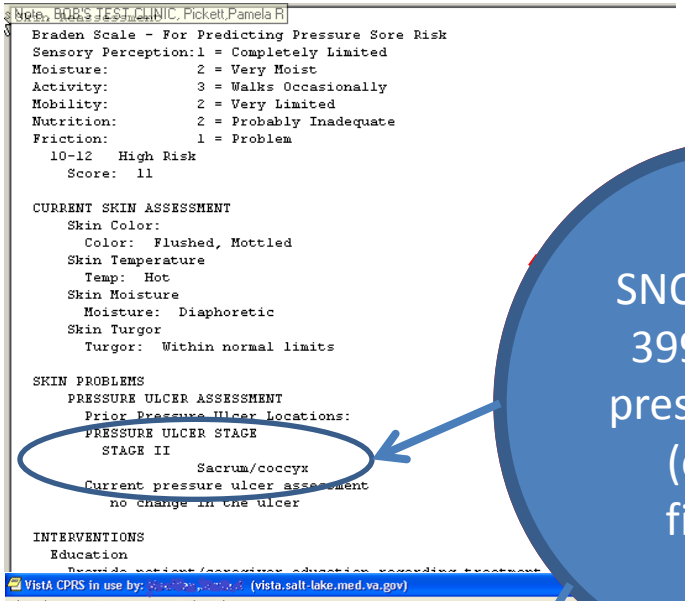
Patient unconscious; readings **inferred**.

The view shows scores from multiple sources in one view.

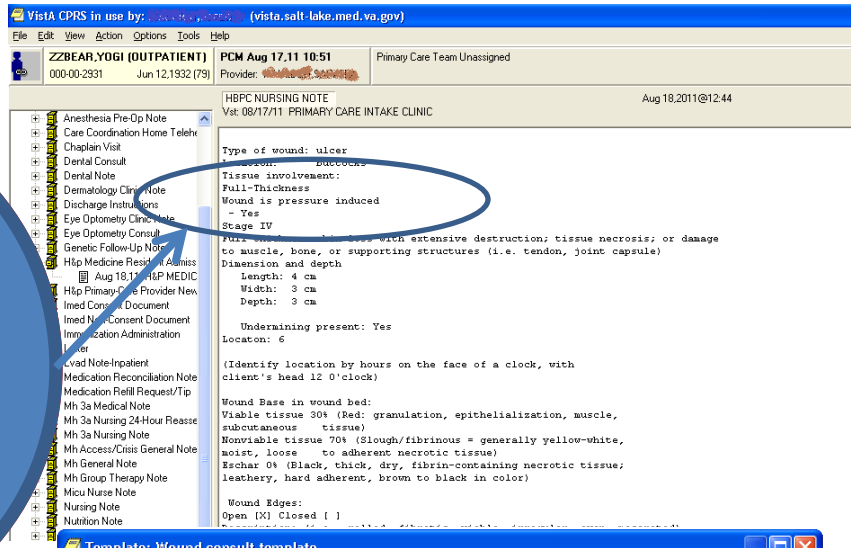


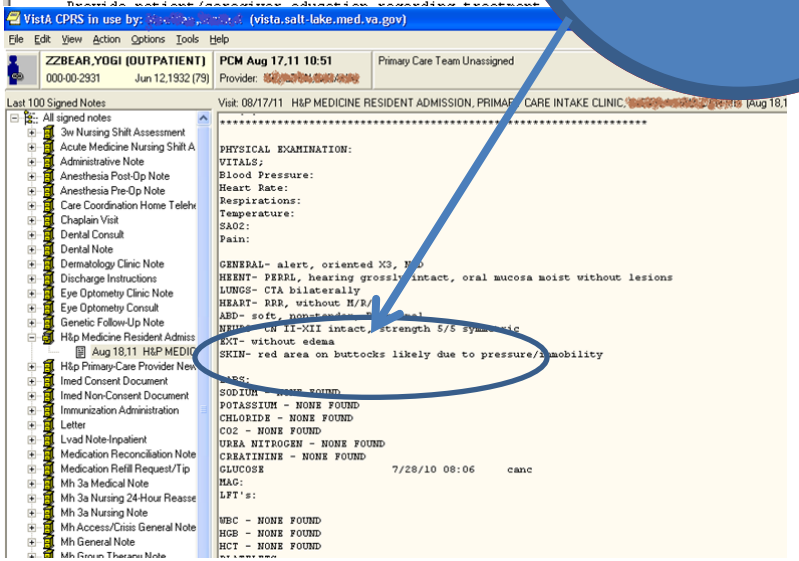
*DSS – Decision Support System

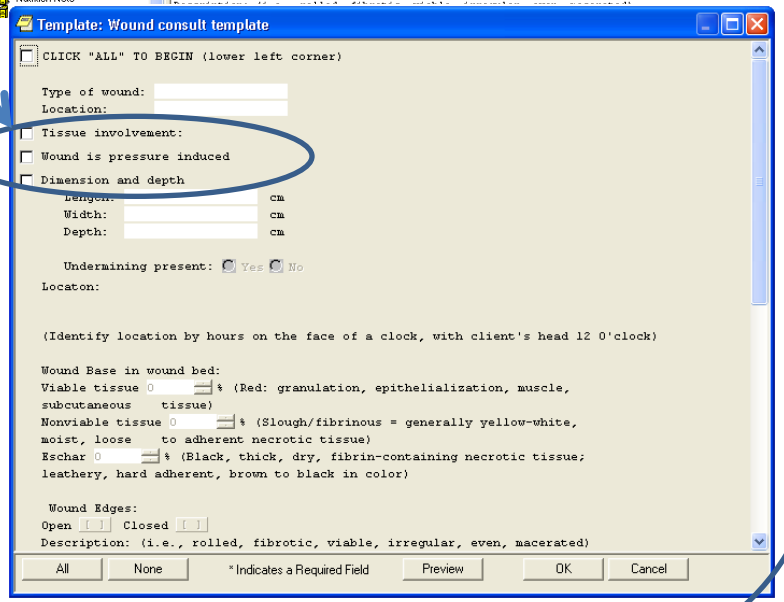
Skin Observations



SNOMED CT: 399912005 pressure sore (clinical finding)

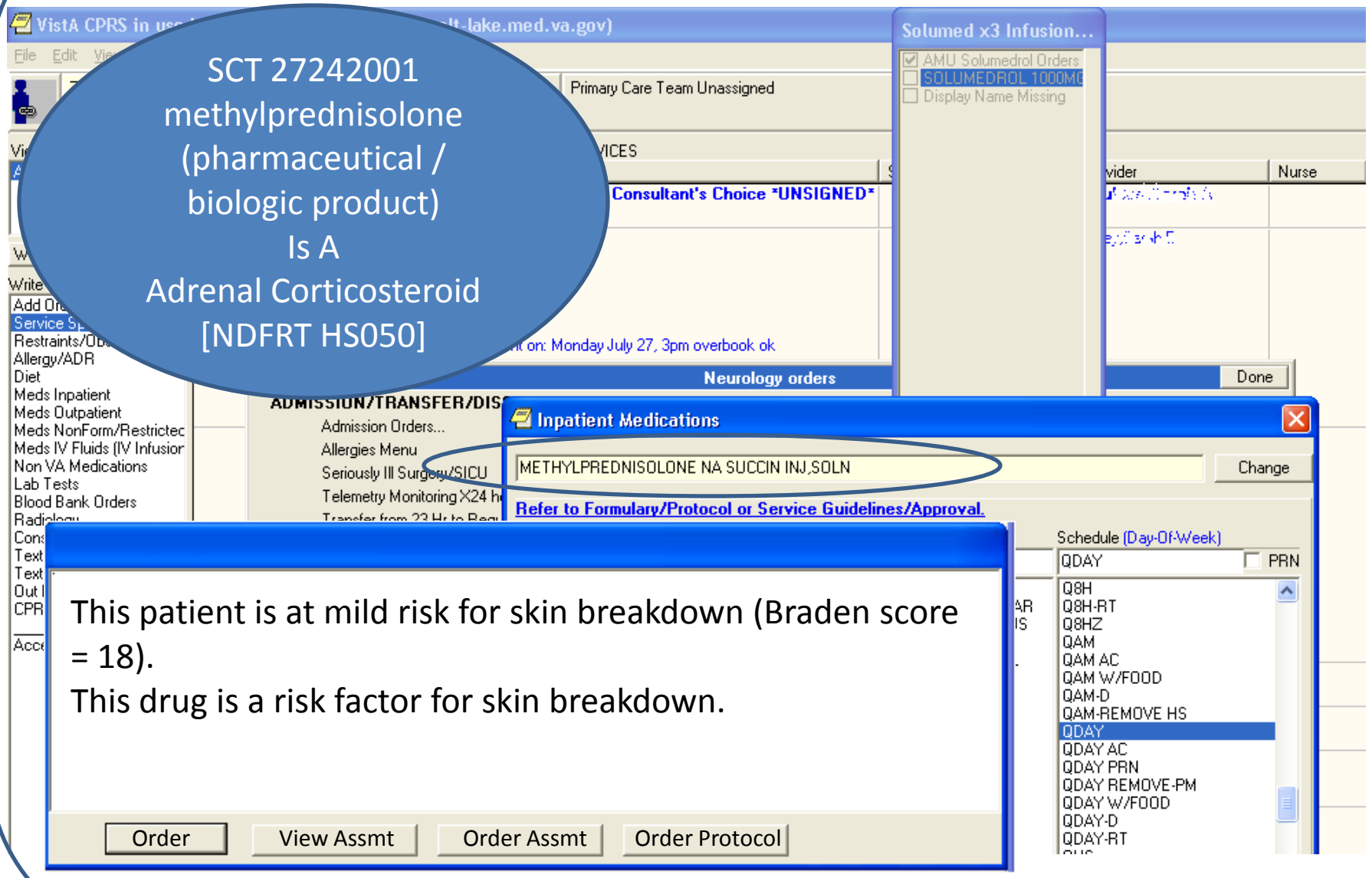




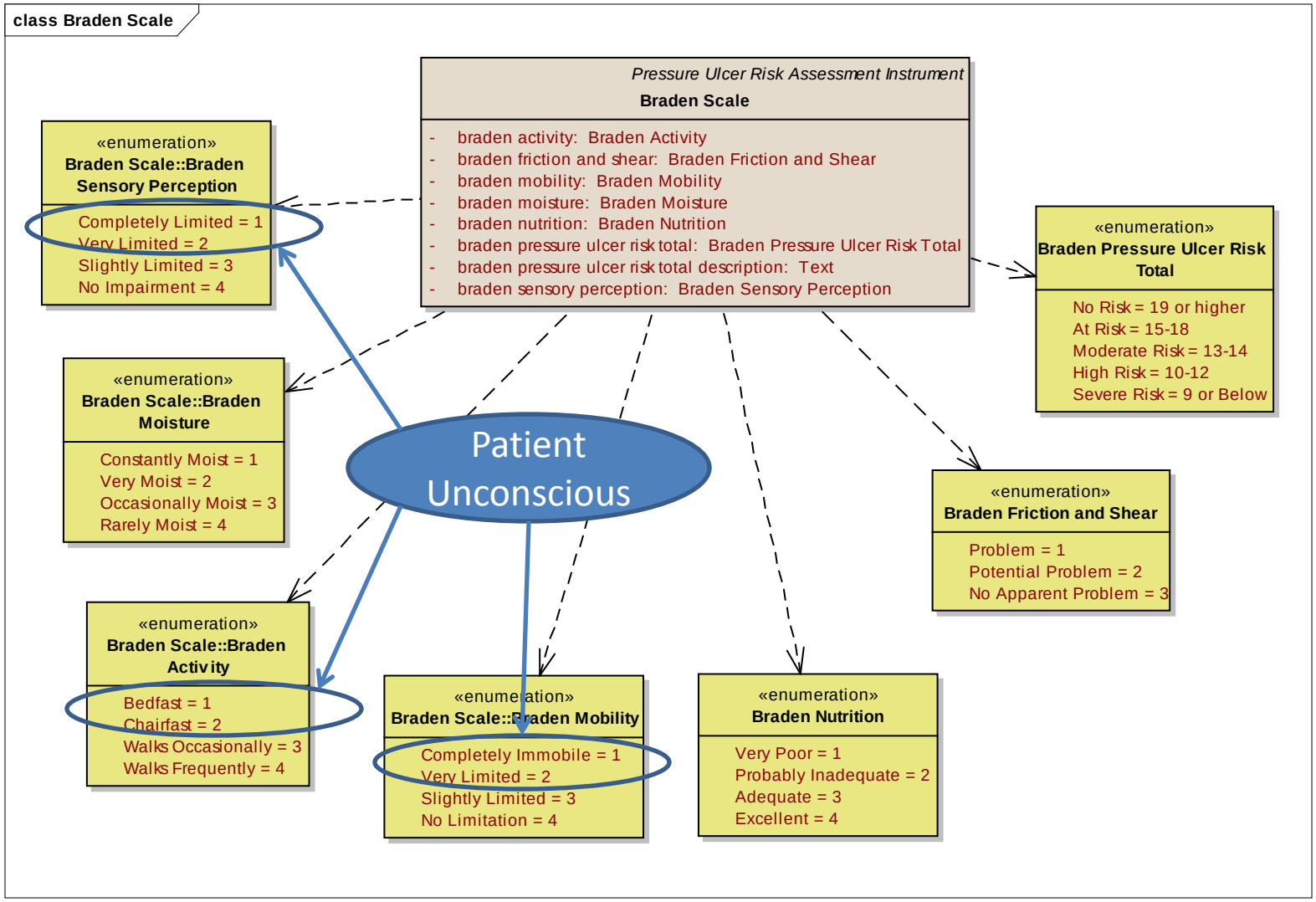


*SNOMED CT - Systemized Nomenclature of Medicine Clinical Terms

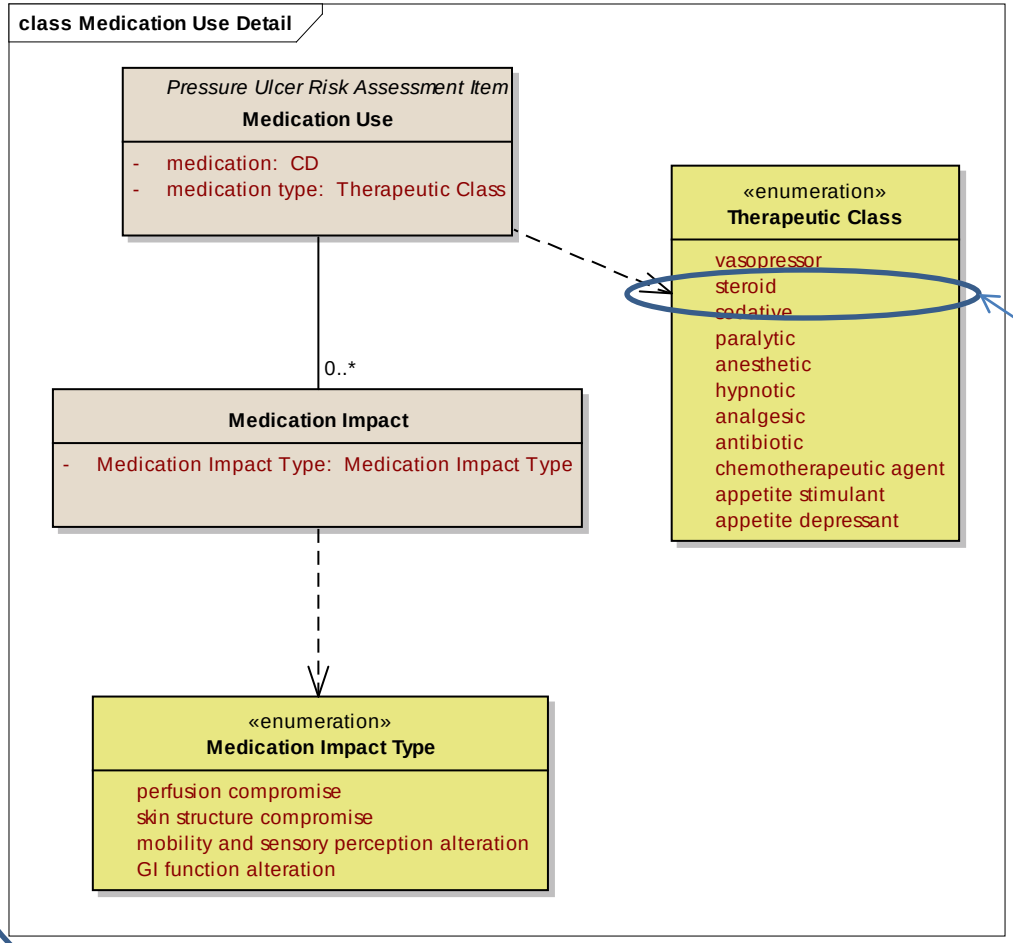
Scenario: Order Logic

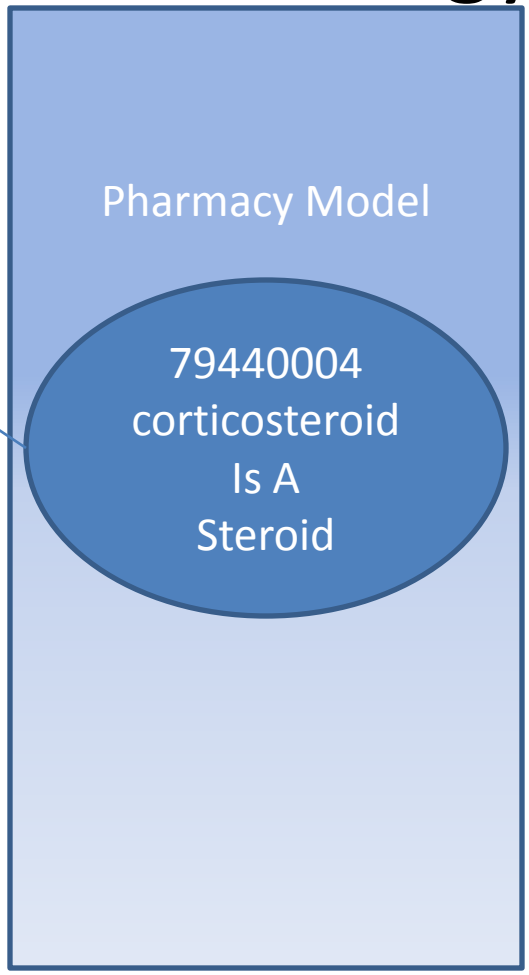


Reusable Components (Content and Structure) Provide the Framework

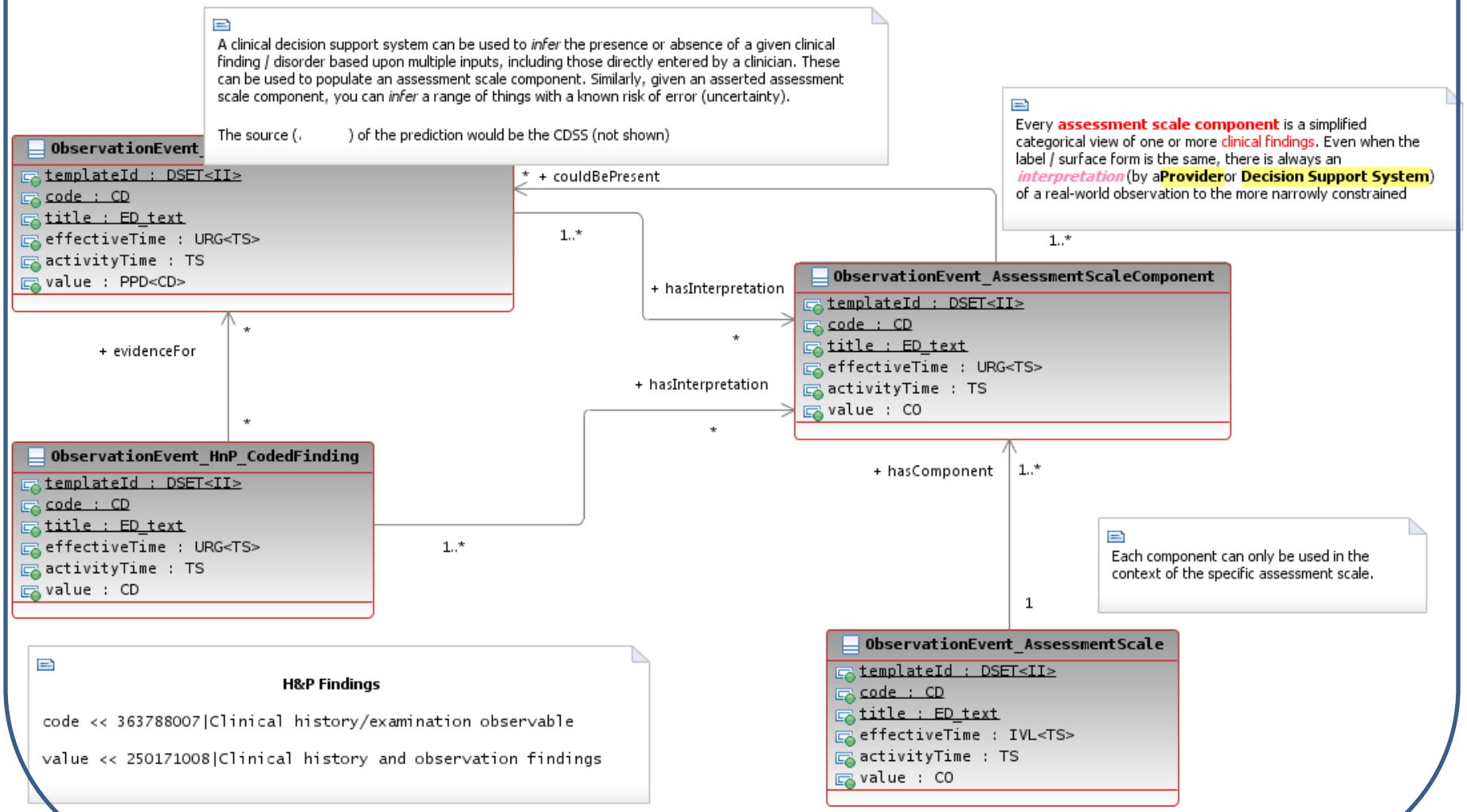


The Future: All Information is Described With Reusable Models and Terminology

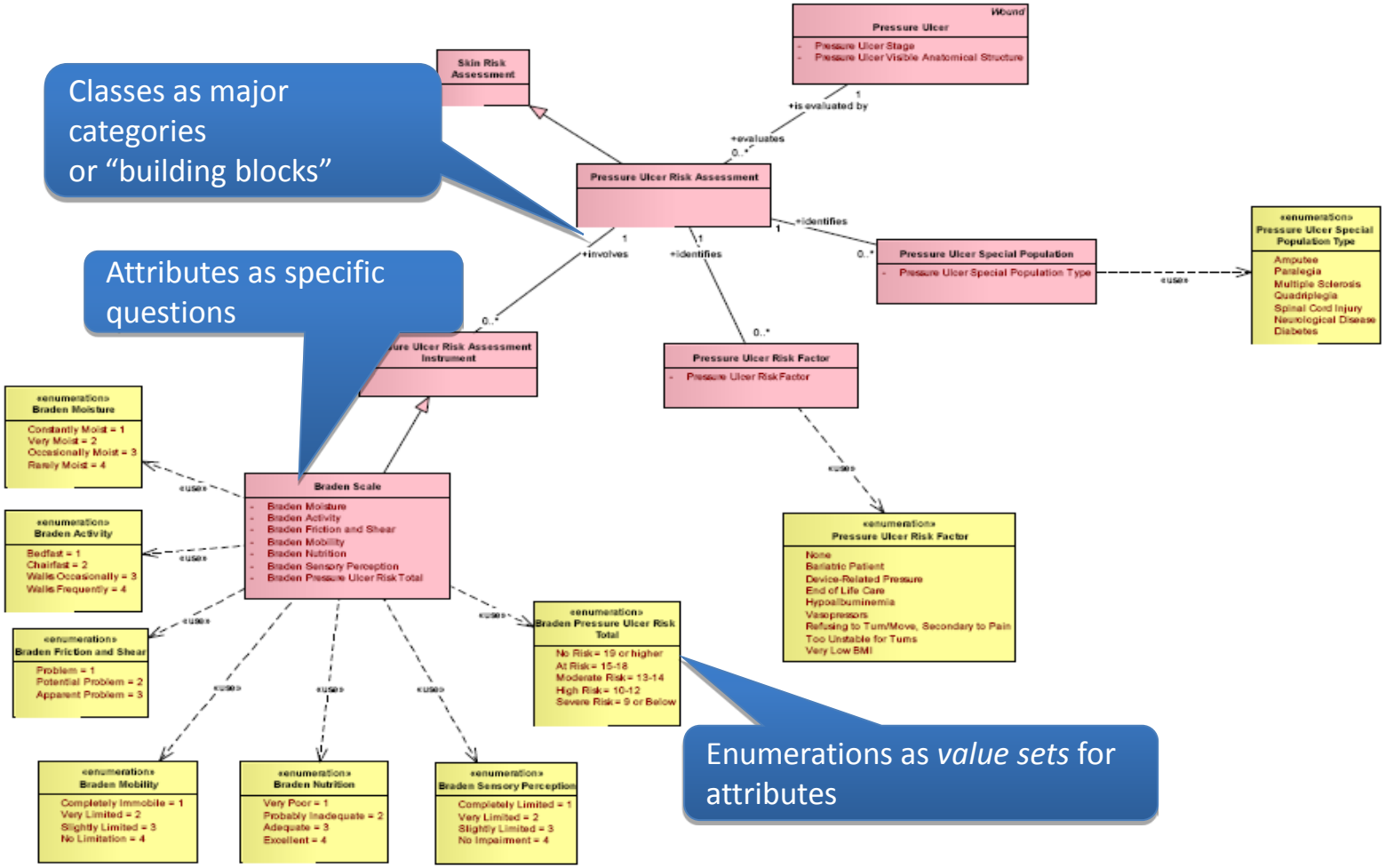




Detailed Clinical Model Template



Method: Formalize the Model in Unified Modeling Language (UML)



Impact to National Database of Nursing Quality Indicators (NDNQI) and Other Current Quality Reporting

- We as health care providers have undesirable variation in the way we collect data for quality reporting
- We can reduce undesirable variation with standards for terminology and common models
- We can automate data collection and reporting when we implement standards for terminology and common models

What Nursing Leaders Need to Know

Three Key Questions to Ask Vendors:

- Is nursing documentation data structured in a discrete and standardized format to facilitate data capture, data re-use and data sharing?
- Is the nursing data mapped to a reference terminology?
- How do you demonstrate data portability between settings and organizations? -provide specific examples of nursing data

Summary

- The imperatives are clear
- Nursing has a strong voice and a plan
- Nurses can leverage the EHR to improve practice
- Nursing leaders need to ensure that data is organized in a standardized way to make it accessible for clinical decision making, quality reporting and research
- Standardization of patient data exchange has the potential for improving patient safety and clinical outcomes

QUESTIONS?