Improving Pressure Ulcer Prevention through Electronic Medical Record Redesign

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change the outcome®

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Cincinnati Children's Hospital Medical Center

- 511 Registered Beds
- 11,000 Employees; Over 3,000 RN's
- Ranked 2nd in NIH Pediatric Funding
- Top 10 Pediatric Hospitals U.S. News & World Report 2005, 2006, 2007, 2008, 2009, 2010
- Received the 2008 Picker Award for Excellence in honor of significant achievements in family-centered care
- Awarded Magnet Designation February 2009

M
MAGNET RECOGNITION
AMERICAN NURSES CREDENTIALING CENTER

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Objectives

- Describe EMR redesigns to improve skin assessments and reduce the patient risk of pressure ulcers.

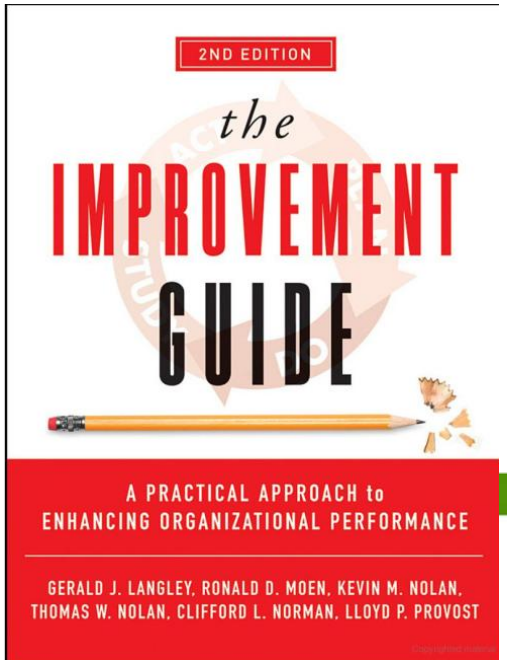
- Describe how EMR alerts help nurses add a skin plan of care for patients at risk for pressure ulcers.

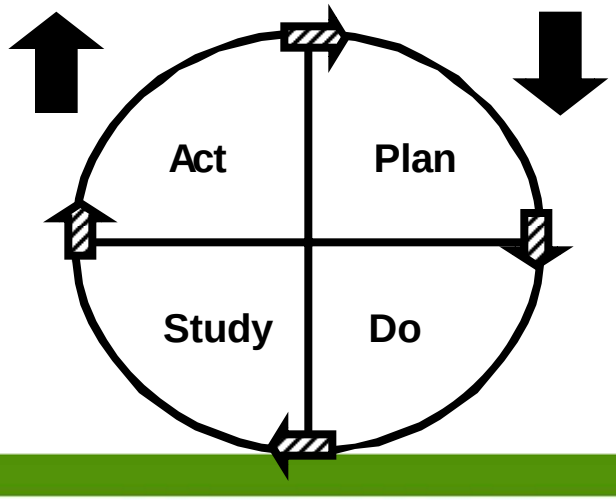
The Improvement Model

What are we trying to accomplish?

How will we know that a change is an improvement?

What changes can we make that will result in improvement?





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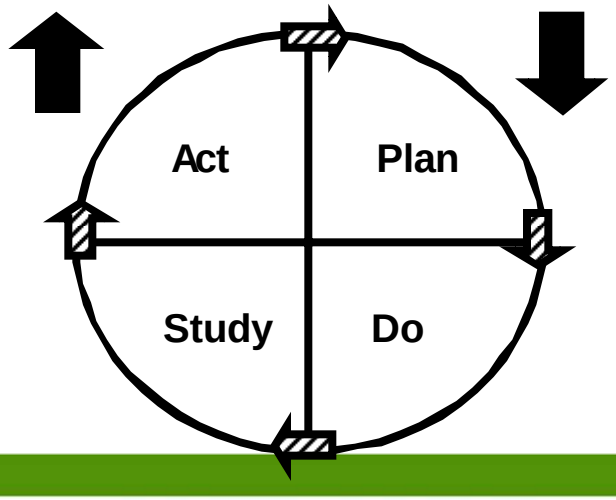

Aim Statements

To increase compliance with skin assessments to 90% or higher through redesign of the EMR and staff education

Overall to reduce pressure ulcer prevalence to $\leq$ 2.7%

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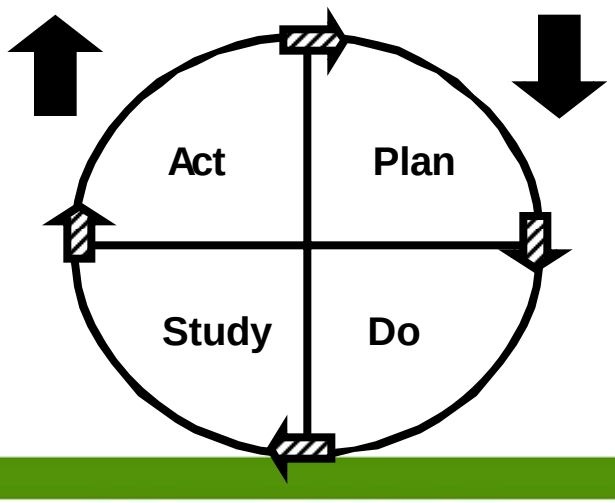
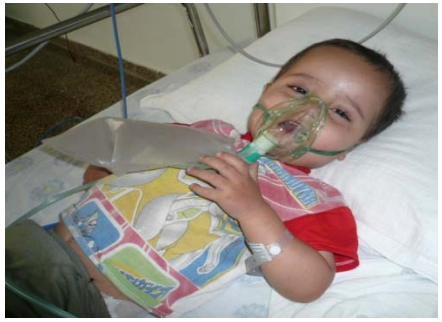


Admission Process Metrics

- Compliance with documenting Braden Q score
- Compliance with documenting a Skin Assessment
- Compliance with documenting a Medical Device Assessment

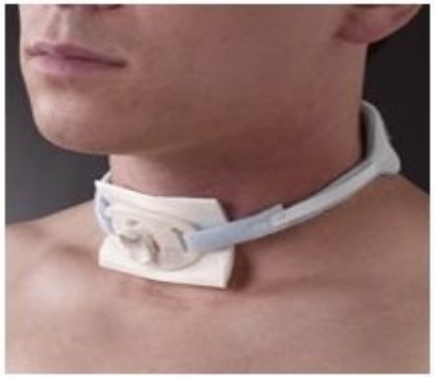
Quarterly Outcome Metrics

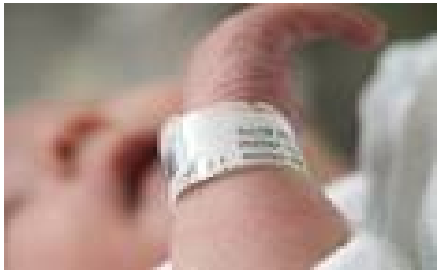
- Facility Acquired Pressure Ulcer Prevalence



Medical Devices

found to be related to pressure ulcer development





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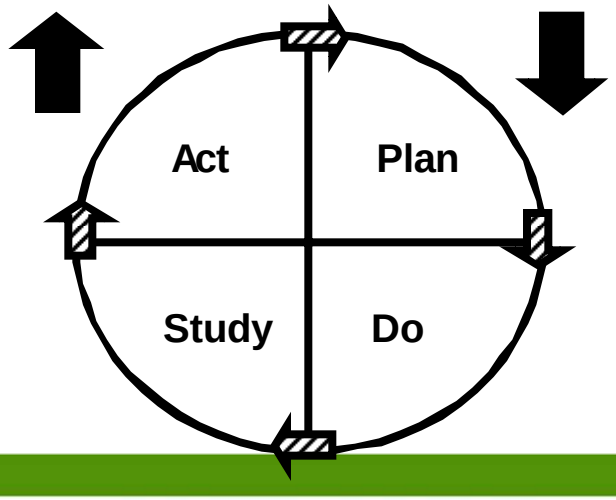

An Outline of Design Concepts for Improving Reliability

Level 1. ***Vigilance and hard work***
(1, or 2, failures out of 10 opportunities or 80 – 90%)

- Awareness and training
- Feedback of data
- Personal reminders by an expeditor
- Standardization (broad, general)

Level 2. ***Human factors and reliability engineering***
(5, or less, failures out of 100 opportunities or 95%)

- Redundancy
- Checklists and reminders (built into the process)
- Differentiation such as color coding
- Real time identification of failures such as drug interactions
- The default is the desired action, for example standard order sets
- Standardization of essential tasks

Level 3. ***Sophisticated behavioral designs***
(5, or less, failures out of 1,000 opportunities or 99%)

- Take advantage of habits and patterns
- Make the system visible
- Clear and unambiguous communication
- High reliability organization Weick
  - *Preoccupation with failure*
    Example - Study the circumstances leading to each hospitalization for an asthma exacerbation
  - *Reluctance to simplify*
    "Dangerous until proven safe rather than safe until proven dangerous"
  - *Sensitivity to operations*
    Moment by moment monitoring of the front line rather than the big picture;
    Example - Red/yellow/green system for monitoring stress levels in patient care units
  - *Commitment to resilience*
    Example - Contingency plans for maintaining access,
    scheduling of unpredictable surgery cases into separate rooms, or code teams
  - *Deference to expertise* wherever it can be found
    Example - Patient or parent involvement in design

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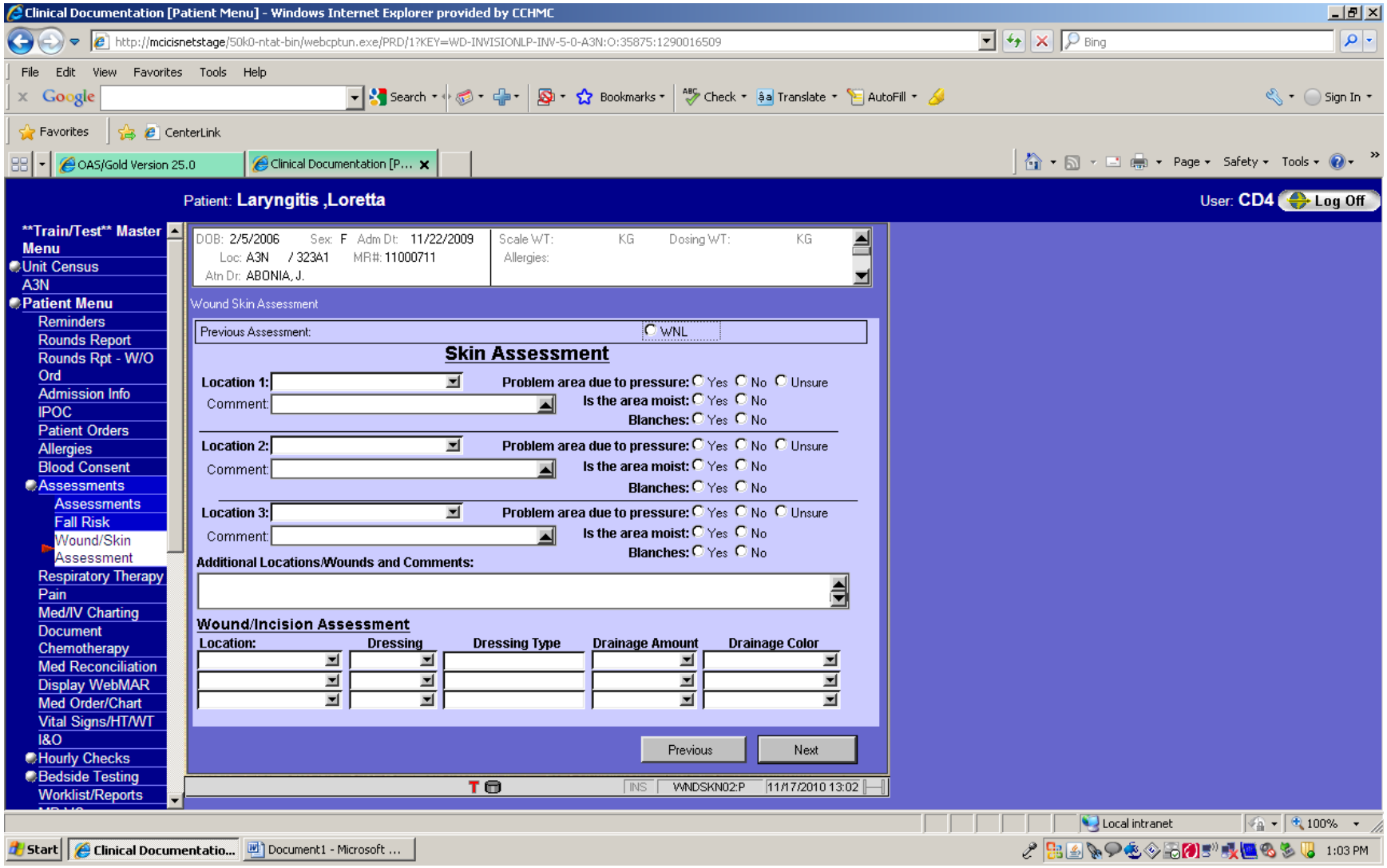
OLD EMR



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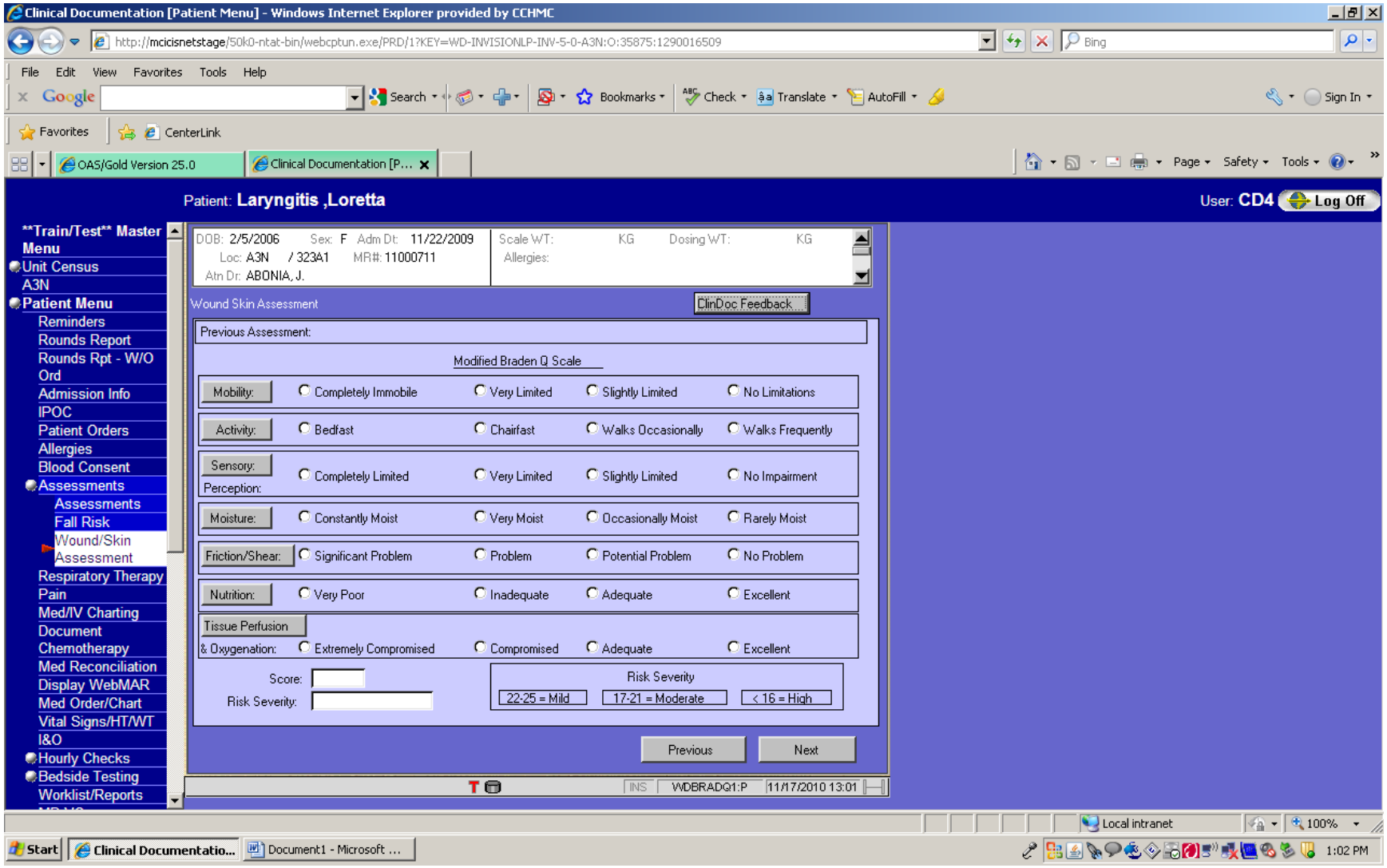
OLD EMR



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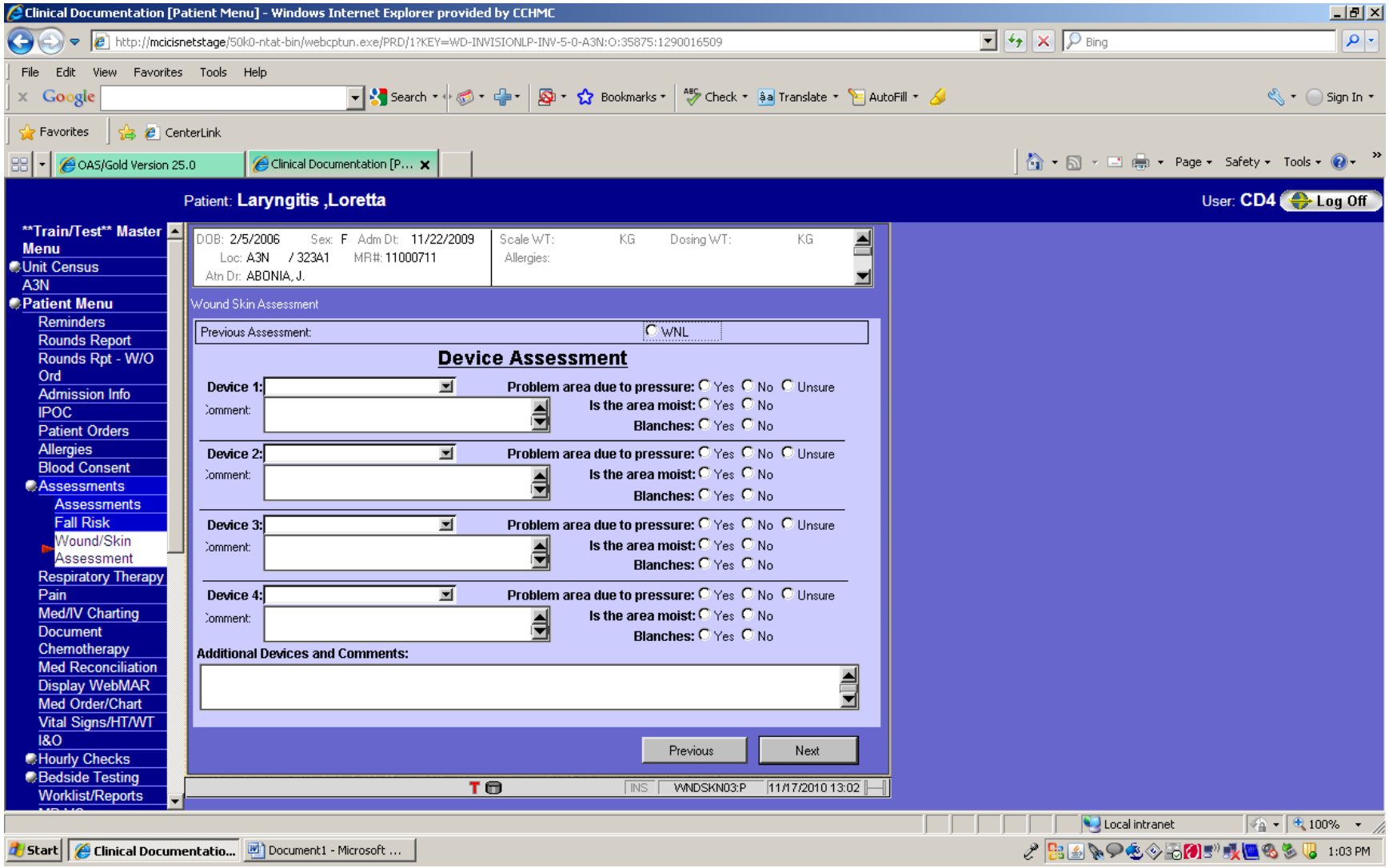

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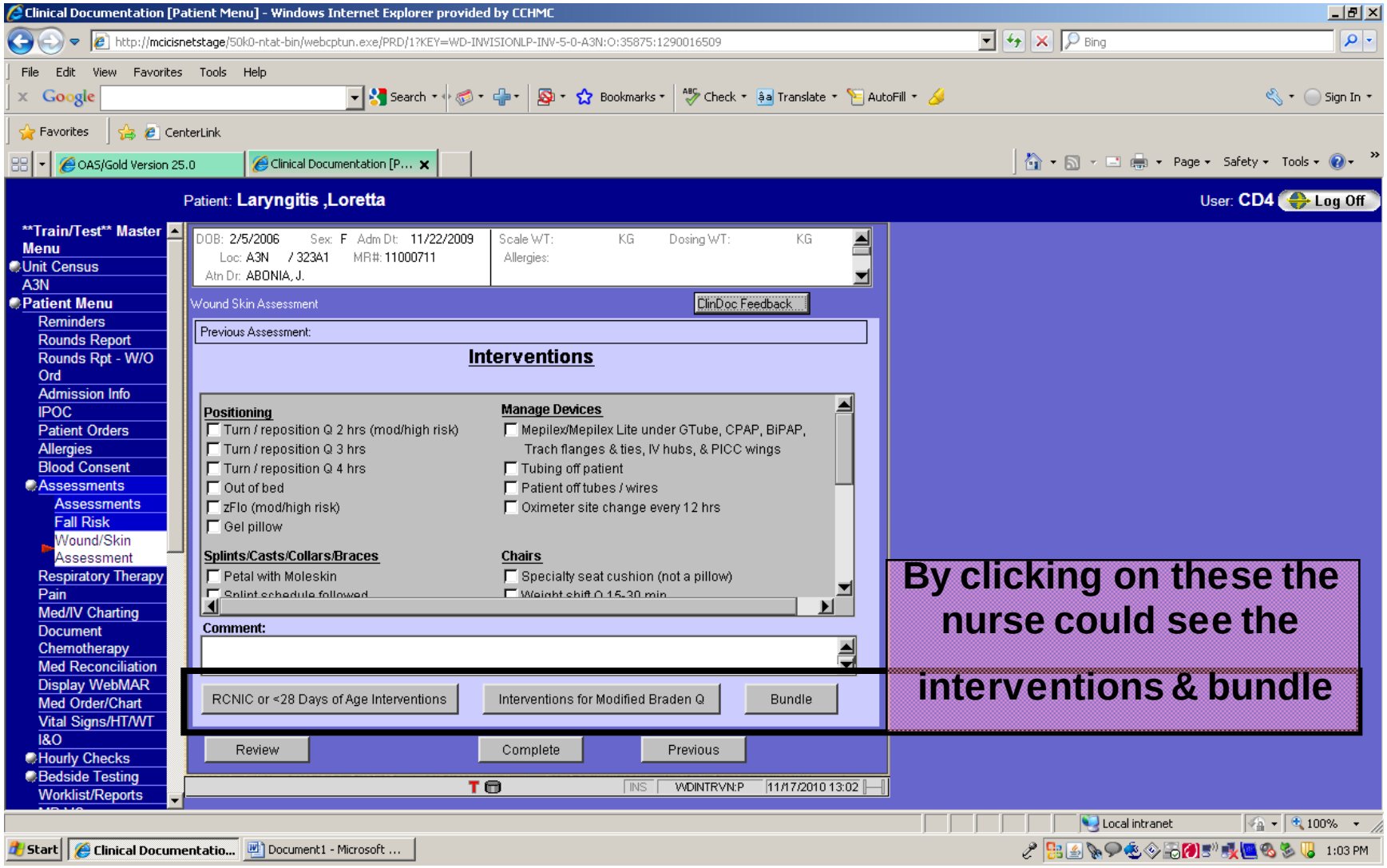
OLD EMR



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OLD EMR

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Interventions for the Modified Braden Q
Mild 22-25 / Moderate 17-21 / High Risk 16 or Less

	Mild Risk	Moderate and High Risk Follow all Interventions & Add
Manage Moisture	▪ check diapers Q2hrs, change as needed ▪ do not use chux or other products with a plastic backing ▪ add moisture barrier to diaper area as necessary ▪ with diaper change, no need to completely remove barrier ▪ completely remove barrier once a day	
Device Protection and Assessment	▪ check under Gtubes, Trachs and other devices for moisture ▪ Mepilex / Mepilex Lite under GTubes, CPAP, BiPAP, Trach flanges & ties ▪ use 1 finger rule for trach ties ▪ prop tubing off patient ▪ do not lay patient on tubes and wires ▪ check ID band site with assessment ▪ change and evaluate oximeter site at least every 12 hours	
Splints Casts Collars Braces	▪ keep skin dry and clean ▪ use all straps ▪ petal with moleskin as needed ▪ assess often for redness, irritation, or tightness ▪ evaluate pain for potential skin compromise	

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Interventions for the RCNIC & Patients <28 days

Skin Care	▪ minimize use of adhesives
Manage Moisture	▪ check diapers Q2 to 4 hrs, change as needed ▪ do not use chux or other products with a plastic backing ▪ add moisture barrier to diaper area as necessary ▪ with diaper change, no need to completely remove barrier ▪ completely remove barrier once a day
Device Protection and Assessment	▪ assess GTube, NG, Replogle, and ETT for pressure areas ▪ check under Gtubes, Trachs and other devices for moisture ▪ may use Mepilex or Mepilex Lite under GTubes, CPAP, Trach flanges or ties, IV hubs, and PICC wings ▪ use 1 finger rule for trach ties ▪ prop tubing off patient ▪ do not lay patient on tubes and wires ▪ check ID band site with assessment ▪ change and evaluate oximeter site at least every 12 hours
Splints Casts Collars Braces	▪ keep skin dry and clean ▪ use all straps ▪ petal with moleskin as needed ▪ assess often for redness, irritation, or tightness ▪ evaluate pain for potential skin compromise
Reposition	▪ only need a 15° shift to make a difference in a neonate ▪ supplement with small shifts in position ▪ document position change ▪ don't forget the head

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Pediatric Pressure Ulcer Prevention Bundle

Comprehensive Assessment

Risk Assessment

- > 28 days of age, use modified Braden Q upon admission and daily
- ≤ 28 days of age, treat as high risk
- All RCNIC patients, treat as high risk

Skin Assessment

- Daily head-to-toe

Device Protection Assessment

- Every shift

Interventions

Positioning	Moisture	Surface	Nutrition	Family
Based on the modified Braden Q assessment, reposition patients at moderate to high risk a minimum of every 2 hours. Reposition patients at low risk a minimum of every 4 hours.	Manage and minimize moisture by checking common moisture sites every 2 to 4 hours, and intervening as needed.	Use pressure reduction surfaces for beds and chairs.	Good nutrition is the first line of defense for prevention of pressure ulcers.	Involve and educate families in pressure ulcer prevention strategies and treatments.

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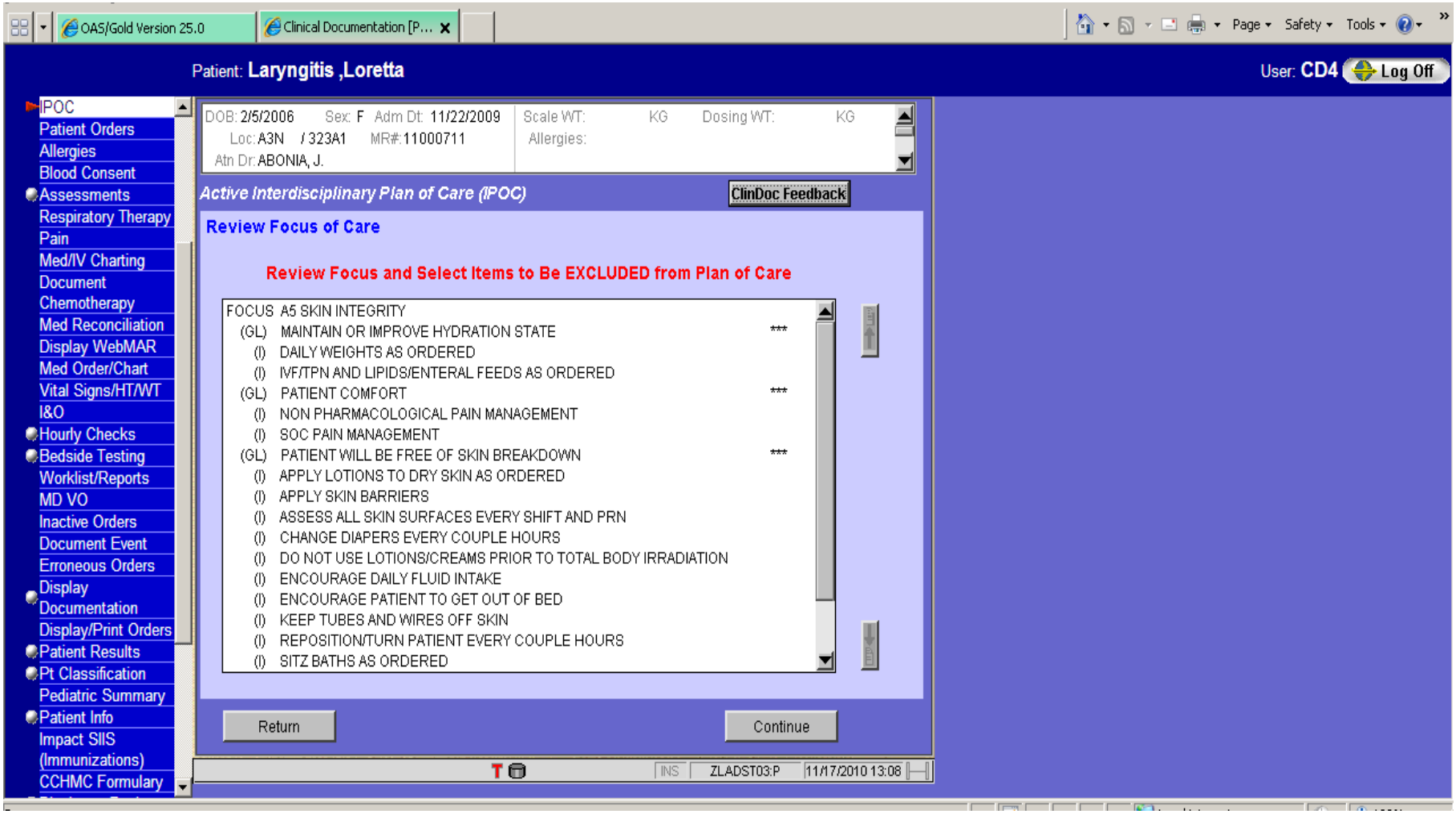
OLD EMR


OAS/Gold Version 25.0
Clinical Documentation [P...
Page
Safety
Tools
Patient: Laryngitis ,Loretta
User: CD4
Log Off
IPOC
Patient Orders
Allergies
Blood Consent
Assessments
Respiratory Therapy
Pain
Med/IV Charting
Document Chemotherapy
Med Reconciliation
Display WebMAR
Med Order/Chart
Vital Signs/HT/WT
I&O
Hourly Checks
Bedside Testing
Worklist/Reports
MD VO
Inactive Orders
Document Event
Erroneous Orders
Display Documentation
Display/Print Orders
Patient Results
Pt Classification
Pediatric Summary
Patient Info
Impact SIIS (Immunizations)
CCHMC Formulary
DOB: 2/5/2006 Sex: F Adm Dt: 11/22/2009
Loc: A3N / 323A1 MR#: 11000711
Atn Dr: ABONIA, J.
Scale WT: KG Dosing WT: KG
Allergies:
Active Interdisciplinary Plan of Care (IPOC)
ClinDoc Feedback
Review Focus of Care
Review Focus and Select Items to Be EXCLUDED from Plan of Care
FOCUS A5 SKIN INTEGRITY
(GL) MAINTAIN OR IMPROVE HYDRATION STATE ***
(I) DAILY WEIGHTS AS ORDERED
(I) IVF/TPN AND LIPIDS/ENTERAL FEEDS AS ORDERED
(GL) PATIENT COMFORT ***
(I) NON PHARMACOLOGICAL PAIN MANAGEMENT
(I) SOC PAIN MANAGEMENT
(GL) PATIENT WILL BE FREE OF SKIN BREAKDOWN ***
(I) APPLY LOTIONS TO DRY SKIN AS ORDERED
(I) APPLY SKIN BARRIERS
(I) ASSESS ALL SKIN SURFACES EVERY SHIFT AND PRN
(I) CHANGE DIAPERS EVERY COUPLE HOURS
(I) DO NOT USE LOTIONS/CREAMS PRIOR TO TOTAL BODY IRRADIATION
(I) ENCOURAGE DAILY FLUID INTAKE
(I) ENCOURAGE PATIENT TO GET OUT OF BED
(I) KEEP TUBES AND WIRES OFF SKIN
(I) REPOSITION/TURN PATIENT EVERY COUPLE HOURS
(I) SITZ BATHS AS ORDERED
Return
Continue
INS
ZLADST03:P
11/17/2010 13:08

EMR Skin Documentation

Old vs New

- Each type of assessment on a separate screen
- Not part of the body system assessment screens
- Unable to view previous assessments on same screen
- Limited # of characters for description of skin issues

- All three assessments on same flow sheet (screen)
- All are a part of the body systems assessments flow sheet (screen)
- Can view multiple assessments from previous times on same screen
- Ability to add comments and more room for detailed descriptions

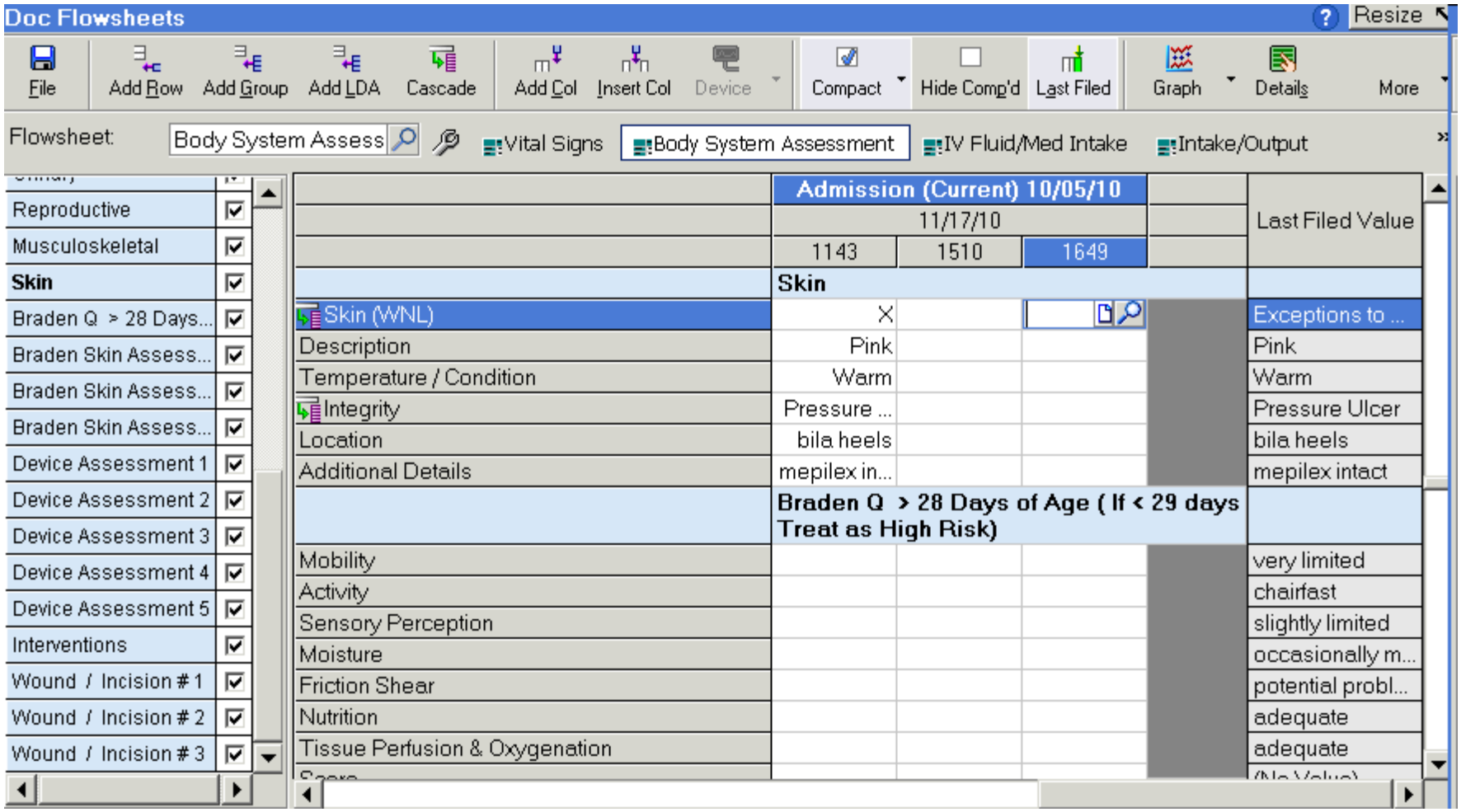
EMR Skin Documentation

Old vs New

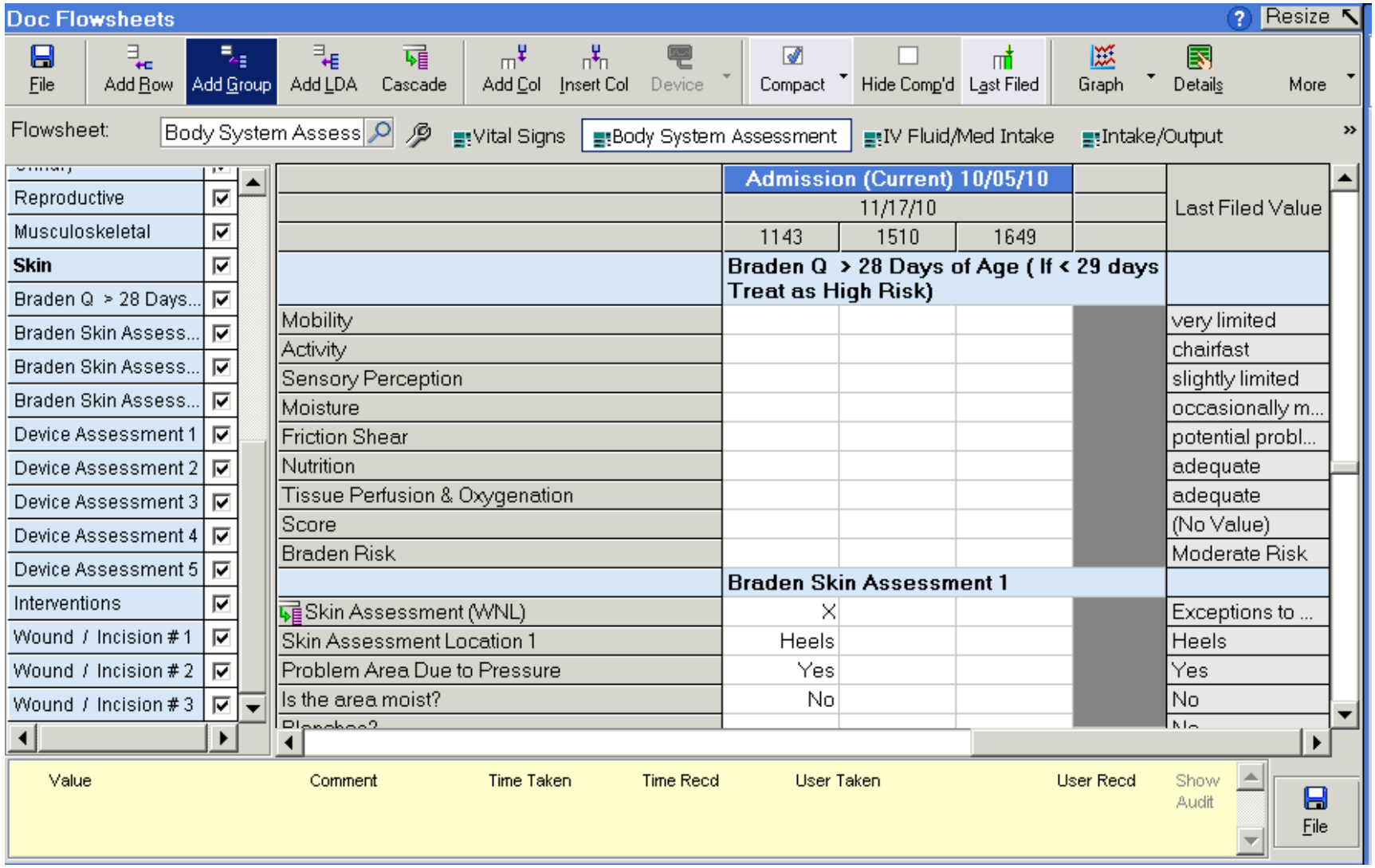
- Two separate areas of the EMR, one to document skin problems & another for other skin assessments
- Perceived as double documentation
- Interventions appeared by manually clicking on buttons

- One area to document all skin findings
- Satisfied nurses who were documenting it all at one time & place
- A high risk assessment automatically generated a "Best Practice Alert" that would visually prompt the nurse to consider adding the Skin Care Plan

NEW EMR


Doc Flowsheets
Resize
File
Add Row
Add Group
Add LDA
Cascade
Add Col
Insert Col
Device
Compact
Hide Comp'd
Last Filed
Graph
Details
More
Flowsheet:
Body System Assess
Vital Signs
Body System Assessment
IV Fluid/Med Intake
Intake/Output
Reproductive
Musculoskeletal
Skin
Braden Q > 28 Days...
Braden Skin Assess...
Braden Skin Assess...
Braden Skin Assess...
Device Assessment 1
Device Assessment 2
Device Assessment 3
Device Assessment 4
Device Assessment 5
Interventions
Wound / Incision # 1
Wound / Incision # 2
Wound / Incision # 3
Admission (Current) 10/05/10
11/17/10
1143
1510
1649
Last Filed Value
Skin
Skin (WNL)
X
Exceptions to ...
Description
Pink
Pink
Temperature / Condition
Warm
Warm
Integrity
Pressure ...
Pressure Ulcer
Location
bila heels
bila heels
Additional Details
mepilex in...
mepilex intact
Braden Q > 28 Days of Age (If < 29 days Treat as High Risk)
Mobility
very limited
Activity
chairfast
Sensory Perception
slightly limited
Moisture
occasionally m...
Friction Shear
potential probl...
Nutrition
adequate
Tissue Perfusion & Oxygenation
adequate

NEW EMR



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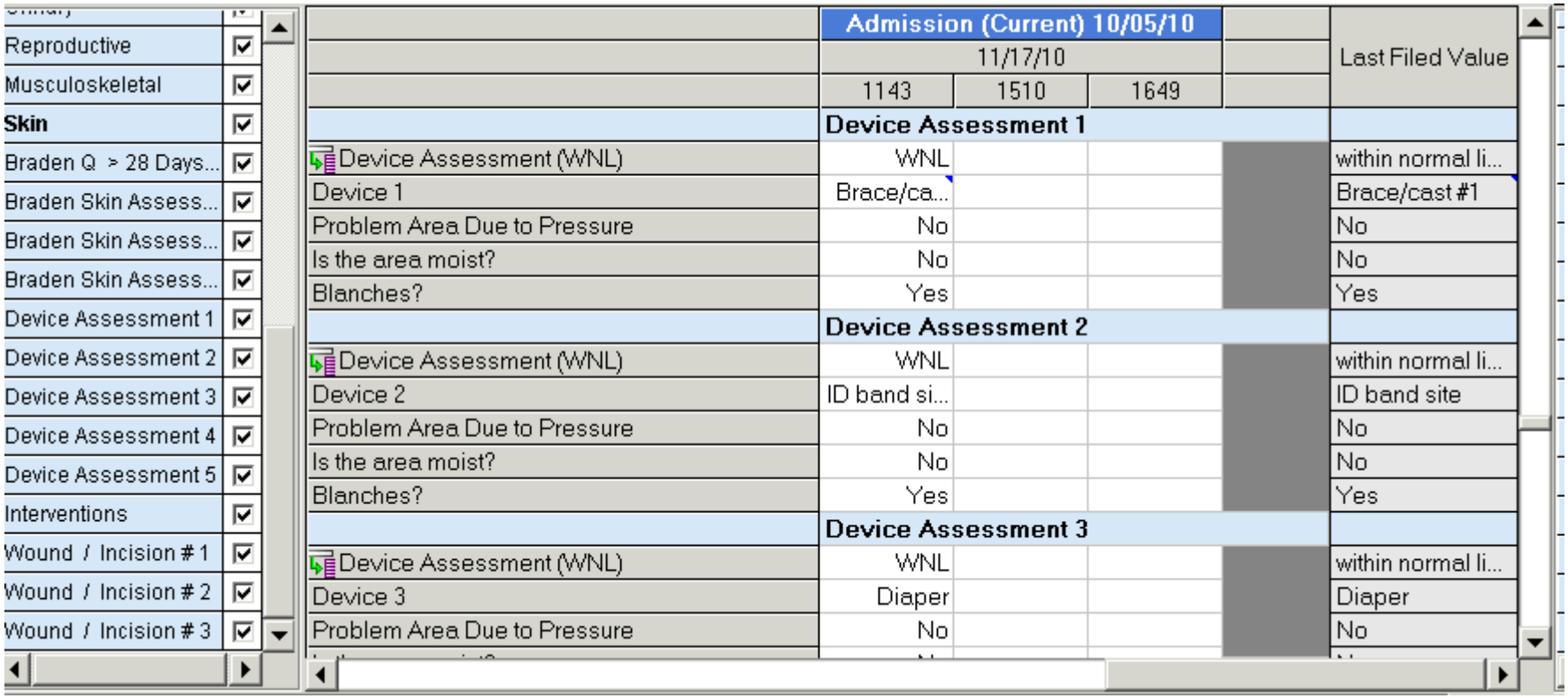
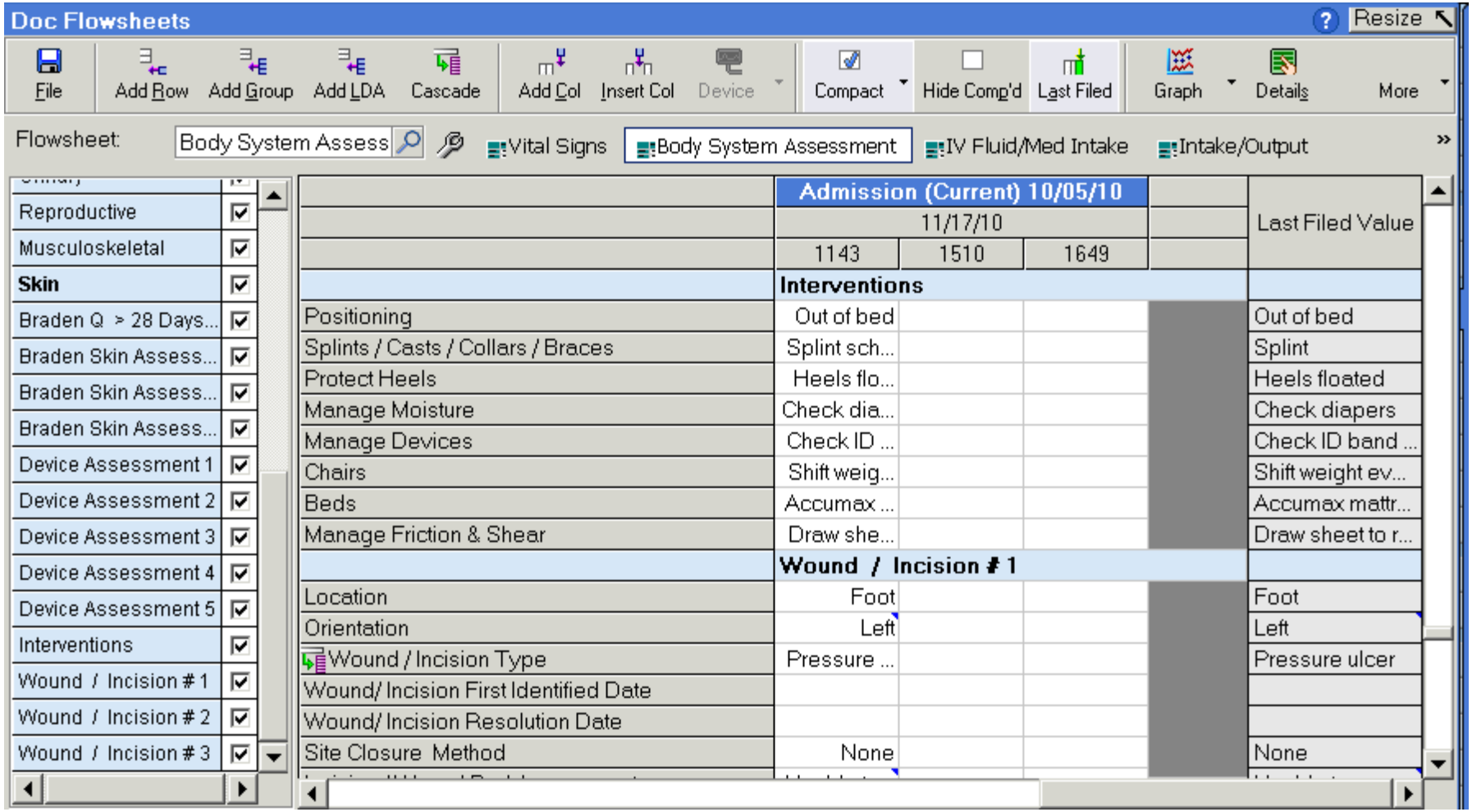


	Admission (Current) 10/05/10				Last Filed Value
	11/17/10				
	1143	1510	1649		
	Device Assessment 1				
Device Assessment (WNL)	WNL				within normal li...
Device 1	Brace/ca...				Brace/cast #1
Problem Area Due to Pressure	No				No
Is the area moist?	No				No
Blanches?	Yes				Yes
	Device Assessment 2				
Device Assessment (WNL)	WNL				within normal li...
Device 2	ID band si...				ID band site
Problem Area Due to Pressure	No				No
Is the area moist?	No				No
Blanches?	Yes				Yes
	Device Assessment 3				
Device Assessment (WNL)	WNL				within normal li...
Device 3	Diaper				Diaper
Problem Area Due to Pressure	No				No

Reproductive
Musculoskeletal
Skin
Braden Q > 28 Days...
Braden Skin Assess...
Braden Skin Assess...
Braden Skin Assess...
Device Assessment 1
Device Assessment 2
Device Assessment 3
Device Assessment 4
Device Assessment 5
Interventions
Wound / Incision # 1
Wound / Incision # 2
Wound / Incision # 3

NEW EMR



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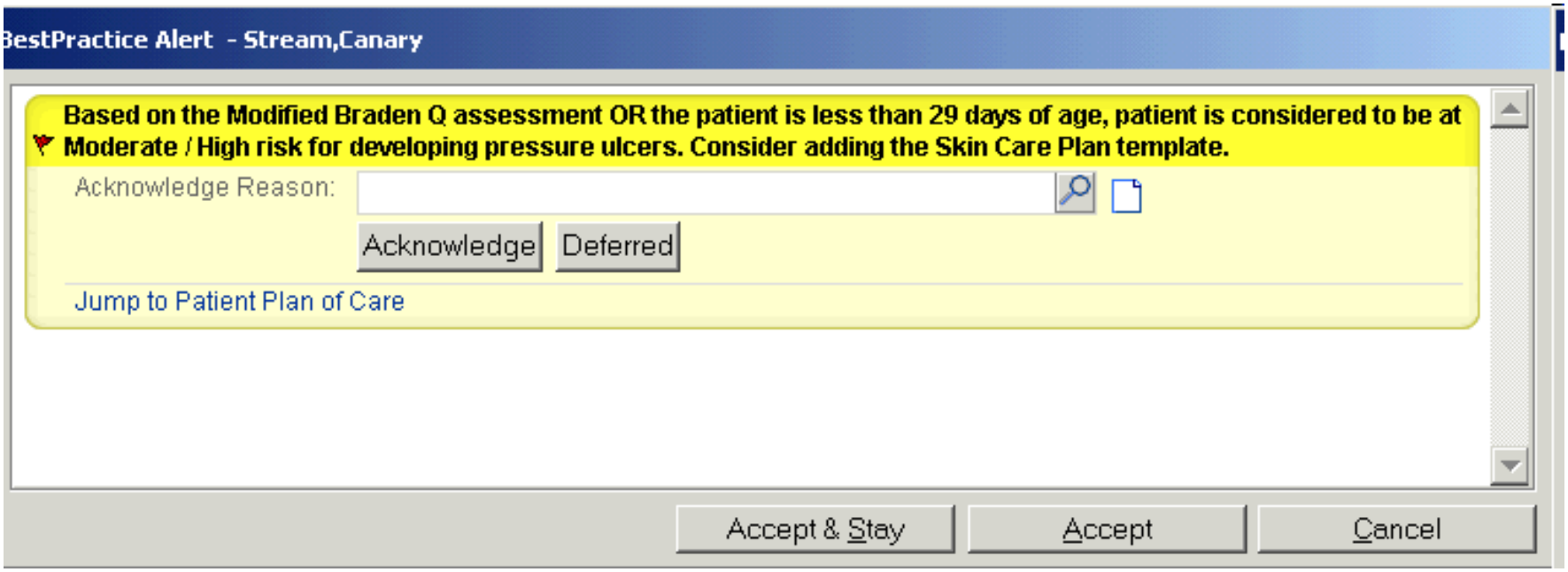
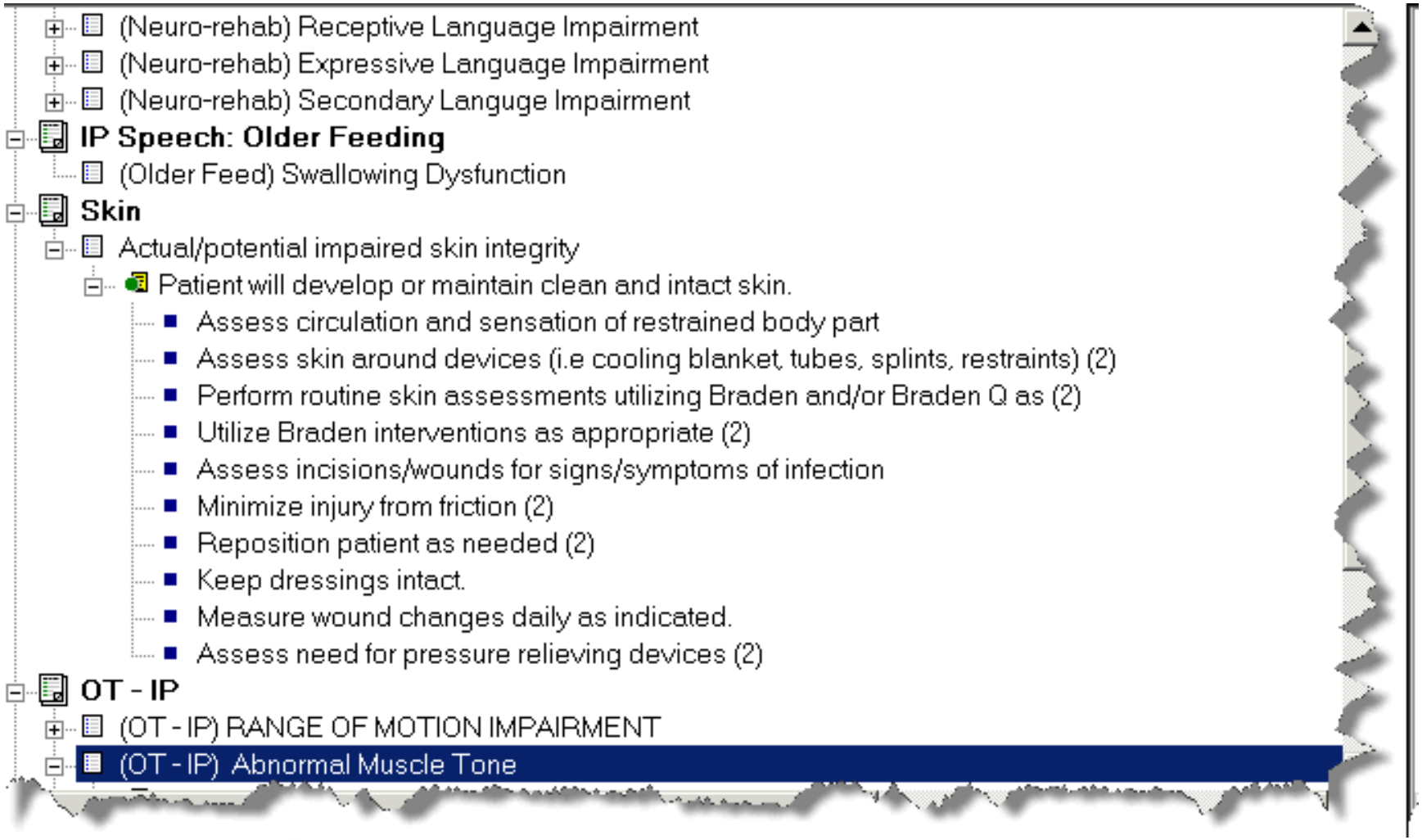

BestPractice Alert - Stream,Canary
Based on the Modified Braden Q assessment OR the patient is less than 29 days of age, patient is considered to be at Moderate / High risk for developing pressure ulcers. Consider adding the Skin Care Plan template.
Acknowledge Reason:
Acknowledge
Deferred
Jump to Patient Plan of Care
Accept & Stay
Accept
Cancel

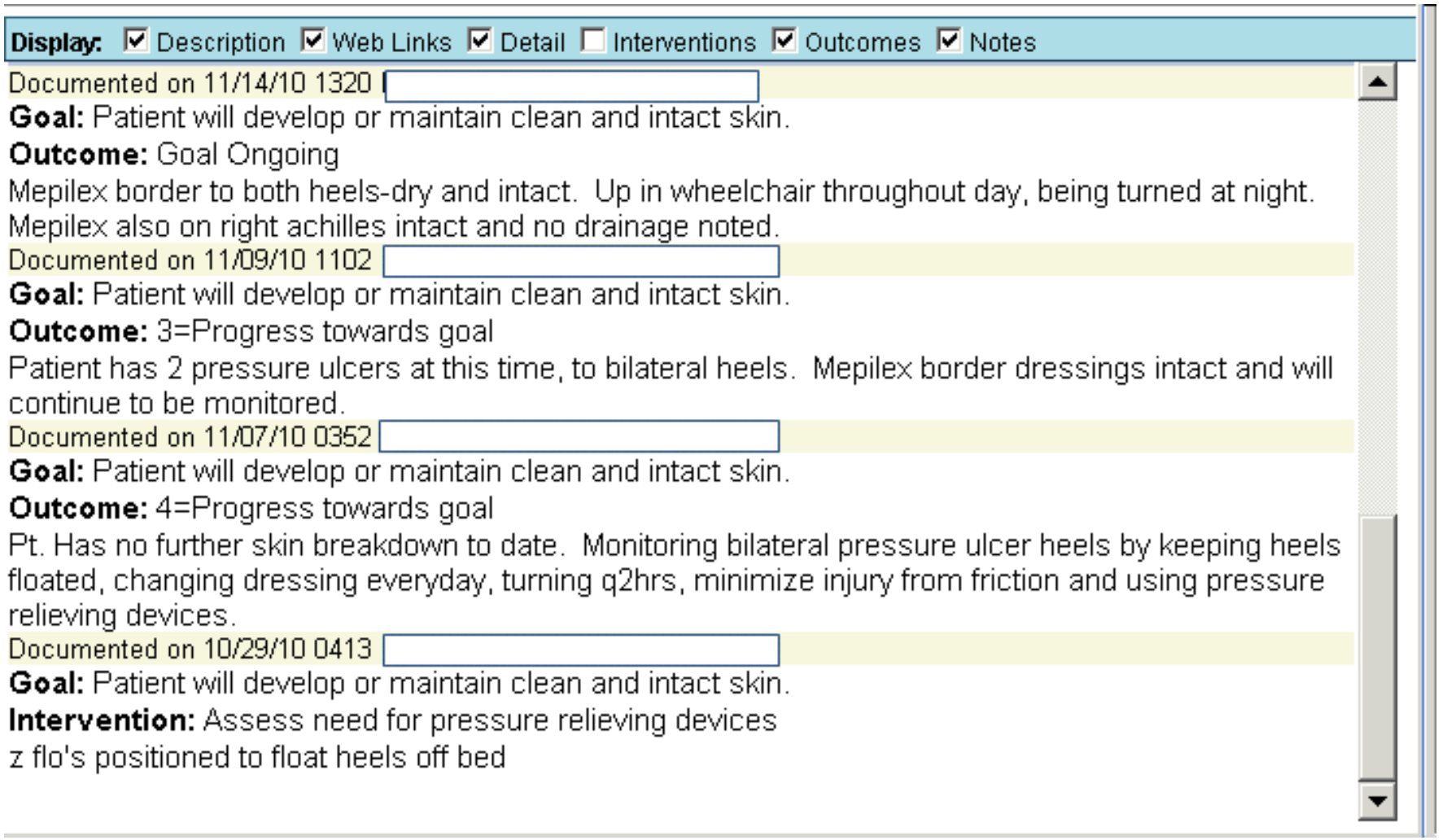
NEW EMR


Display: Description Detail Goals Interventions
Actual/potential impaired skin integrity
Resolve
Modify Problem
Goal: Patient will develop or maintain clean and intact skin.
Indicators of Progress Towards Goal:
Skin is clean and intact, with lack of redness, excoriation, or lesions
1 = Unstable; immediate intervention(s) required
2 = Variable; frequent intervention required
3 = Manageable; requires close monitoring
4 = Stable; with current therapy
5 = Normal/at baseline; problem resolved
Initial Rating: 1 = Unstable; immediate intervention(s) required
Outcome Target Rating: 4 = Stable; with current therapy
Interventions
1. Identify contributing factors
2. Utilize Braden interventions as appropriate
3. Minimize injury from friction
4. Reposition patient as needed
5. Keep skin dry
6. Refer to specialty skin resources as needed
7. Assess need for pressure relieving devices

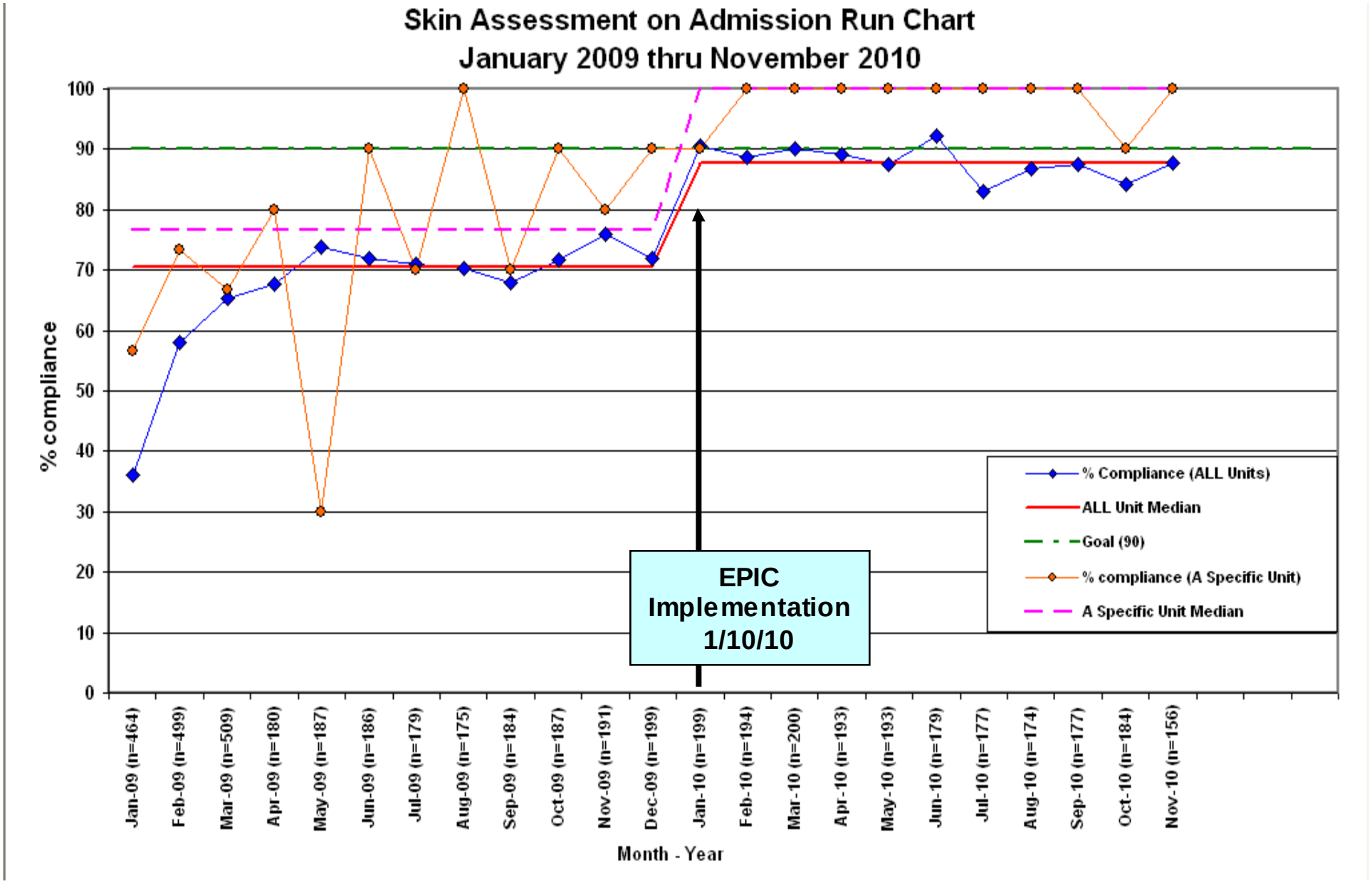
NEW EMR

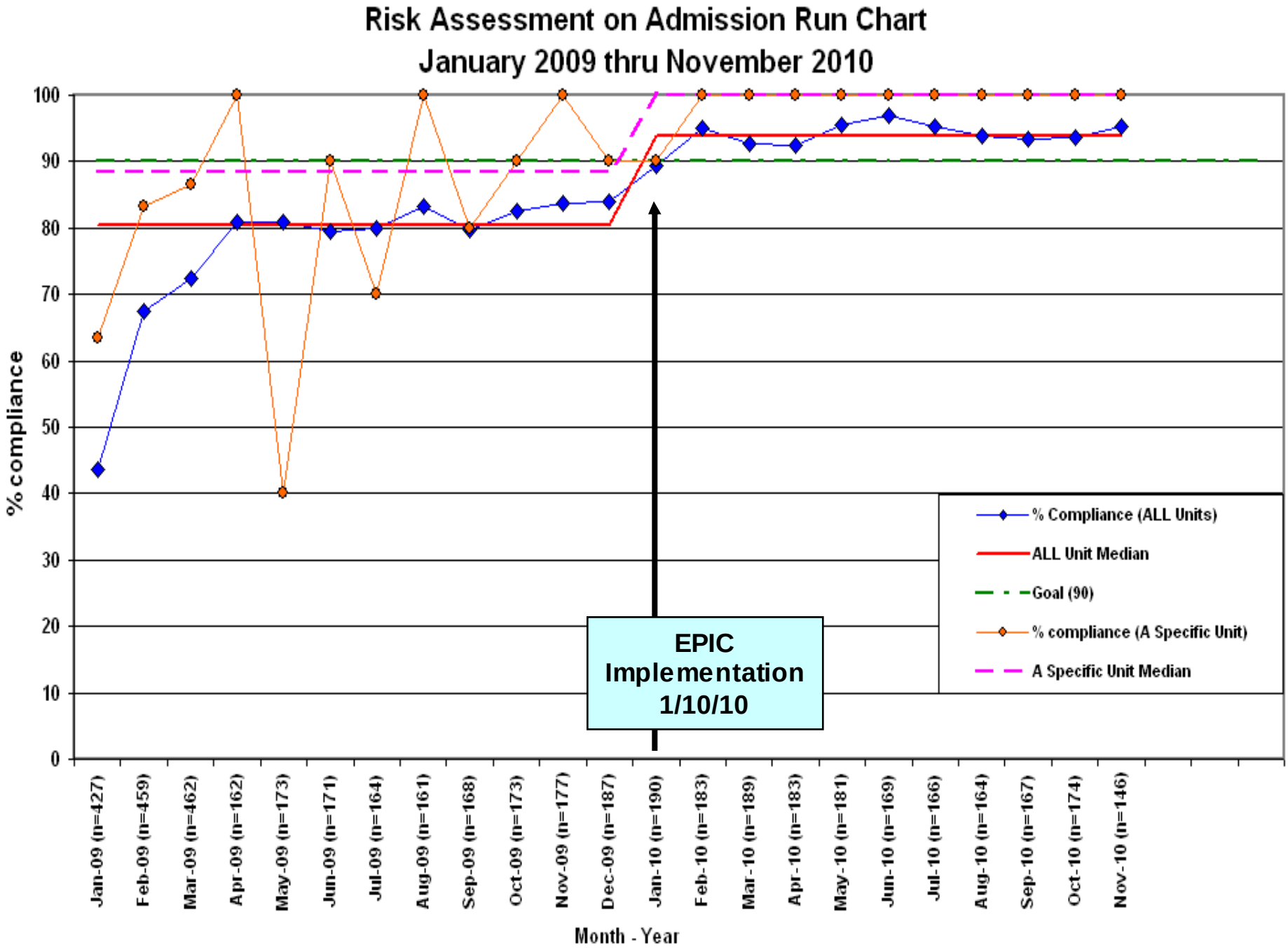

(Neuro-rehab) Receptive Language Impairment
(Neuro-rehab) Expressive Language Impairment
(Neuro-rehab) Secondary Languge Impairment
IP Speech: Older Feeding
(Older Feed) Swallowing Dysfunction
Skin
Actual/potential impaired skin integrity
Patient will develop or maintain clean and intact skin.
Assess circulation and sensation of restrained body part
Assess skin around devices (i.e cooling blanket, tubes, splints, restraints) (2)
Perform routine skin assessments utilizing Braden and/or Braden Q as (2)
Utilize Braden interventions as appropriate (2)
Assess incisions/wounds for signs/symptoms of infection
Minimize injury from friction (2)
Reposition patient as needed (2)
Keep dressings intact.
Measure wound changes daily as indicated.
Assess need for pressure relieving devices (2)
OT - IP
(OT - IP) RANGE OF MOTION IMPAIRMENT
(OT - IP) Abnormal Muscle Tone

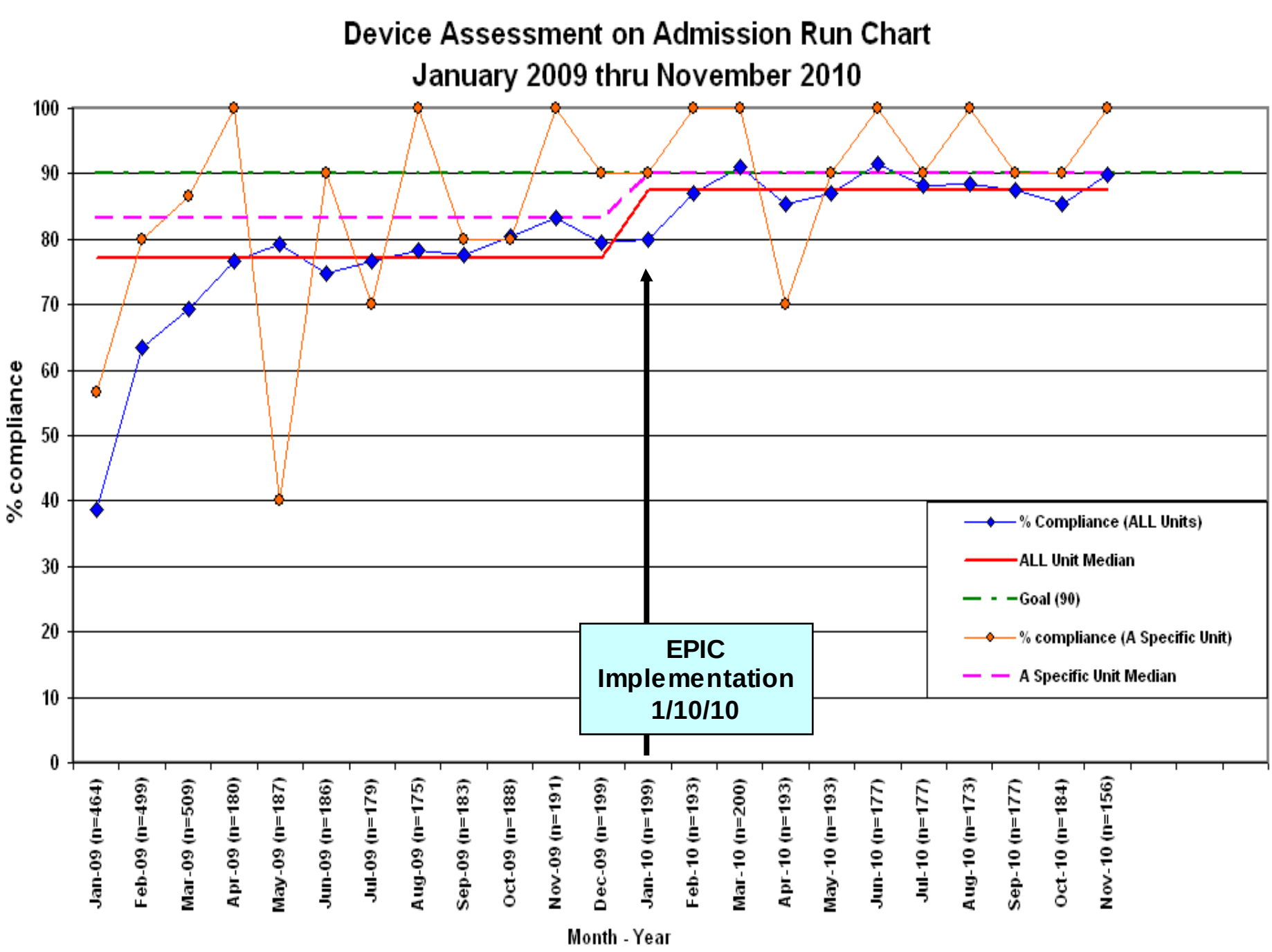
NEW EMR

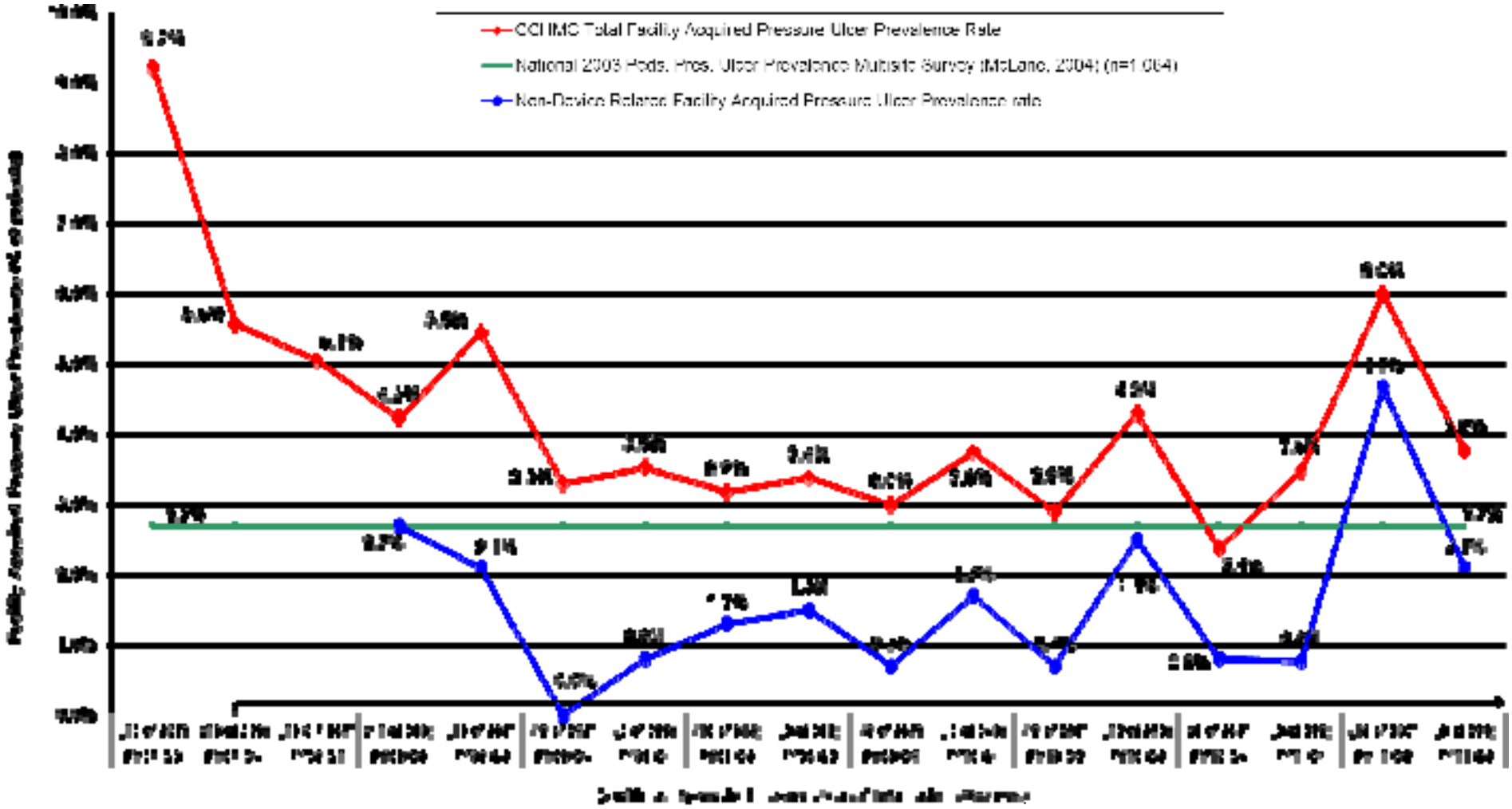

Display: Description Web Links Detail Interventions Outcomes Notes
Documented on 11/14/10 1320
Goal: Patient will develop or maintain clean and intact skin.
Outcome: Goal Ongoing
Mepilex border to both heels-dry and intact. Up in wheelchair throughout day, being turned at night. Mepilex also on right achilles intact and no drainage noted.
Documented on 11/09/10 1102
Goal: Patient will develop or maintain clean and intact skin.
Outcome: 3=Progress towards goal
Patient has 2 pressure ulcers at this time, to bilateral heels. Mepilex border dressings intact and will continue to be monitored.
Documented on 11/07/10 0352
Goal: Patient will develop or maintain clean and intact skin.
Outcome: 4=Progress towards goal
Pt. Has no further skin breakdown to date. Monitoring bilateral pressure ulcer heels by keeping heels floated, changing dressing everyday, turning q2hrs, minimize injury from friction and using pressure relieving devices.
Documented on 10/29/10 0413
Goal: Patient will develop or maintain clean and intact skin.
Intervention: Assess need for pressure relieving devices
z flo's positioned to float heels off bed

Sharing Housewide Process Measures with Unit Leaders & Staff




Risk Assessment on Admission Run Chart
January 2009 thru November 2010
% compliance
100
90
80
70
60
50
40
30
20
10
0
Jan-09 (n=427)
Feb-09 (n=459)
Mar-09 (n=462)
Apr-09 (n=162)
May-09 (n=173)
Jun-09 (n=171)
Jul-09 (n=164)
Aug-09 (n=161)
Sep-09 (n=168)
Oct-09 (n=173)
Nov-09 (n=177)
Dec-09 (n=187)
Jan-10 (n=190)
Feb-10 (n=183)
Mar-10 (n=189)
Apr-10 (n=183)
May-10 (n=181)
Jun-10 (n=169)
Jul-10 (n=166)
Aug-10 (n=164)
Sep-10 (n=167)
Oct-10 (n=174)
Nov-10 (n=146)
Month - Year
EPIC Implementation 1/10/10
% Compliance (ALL Units)
ALL Unit Median
Goal (90)
% compliance (A Specific Unit)
A Specific Unit Median


Device Assessment on Admission Run Chart
January 2009 thru November 2010
% compliance
100
90
80
70
60
50
40
30
20
10
0
EPIC Implementation 1/10/10
% Compliance (ALL Units)
ALL Unit Median
Goal (90)
% compliance (A Specific Unit)
A Specific Unit Median
Jan-09 (n=464)
Feb-09 (n=499)
Mar-09 (n=509)
Apr-09 (n=180)
May-09 (n=187)
Jun-09 (n=186)
Jul-09 (n=179)
Aug-09 (n=175)
Sep-09 (n=183)
Oct-09 (n=188)
Nov-09 (n=191)
Dec-09 (n=199)
Jan-10 (n=199)
Feb-10 (n=193)
Mar-10 (n=200)
Apr-10 (n=193)
May-10 (n=193)
Jun-10 (n=177)
Jul-10 (n=177)
Aug-10 (n=173)
Sep-10 (n=177)
Oct-10 (n=184)
Nov-10 (n=156)
Month - Year



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Questions?