



eMAR Design Standards to Improve Patient Safety

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Nurses' UX Paint Points

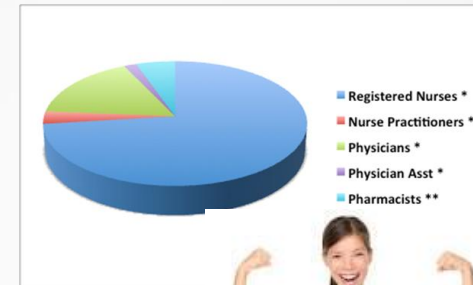




Message #1: Design for Nurses

Design for Nurses

- 3.6 million nurses in the U.S.¹
 - Most work in acute care, long term care
 - National health IT focus to date has been on ambulatory care and supporting physicians
- Nurses are closest to patients
 - Transform design to person-centered HIT
- First line of defense for patient safety
 - A main role is monitoring patient status
 - Supporting nurses is a vote to supporting patients and their safety
 - **Nurses' information needs are unique** with some common elements





**Message #2:
Design for the Ecosystem**

eMAR Current Process

Patient Summary: Fish, Broiled - 00010918 Opened by Train,190. MRN: 00010918, DOB: 5/17/1988, Age: 21 years. Allergies: None listed.

Time View (Clinical Range: 28 November 2010 14:43 - 30 November 2010 14:43):

Medications	11/28/2010 17:00	11/28/2010 21:00	11/28/2010 22:10
Scheduled			
albuterol (albuterol Neb) 2.5 mg, NEB, SOLUTION, QID, 11/27/10 12:00, except when sleeping			ending Validati
albuterol 2.5 mg, PO, TAB, BID, 11/27/10 14:00	Not Done: Patient I		2.5 mg NEB Un
aspirin 81 mg, PO, TAB, BID, 11/27/10 14:00			
captopril 12.5 mg, PO, TAB, BID, 11/27/10 14:00			
pratropium (pratropium Neb) 0.5 mg, NEB, SOLUTION, QID, 11/27/10 12:00, except when sleeping			ending Validati
ipratropium 0.5 mg, NEB, SOLUTION, QID, 11/27/10 12:00, except when sleeping	Not Done: Patient I		0.5 mg NEB Un
metoprolol 25 mg, PO, TAB, BID, 11/28/10 21:00			
metoprolol 25 mg, PO, TAB, BID, 11/28/10 21:00			25 mg PO Final
simvastatin 20 mg, PO, TAB, BID, 11/27/10 14:00			
simvastatin 20 mg, PO, TAB, BID, 11/27/10 14:00			20 mg PO Final

Medication Administration Log (Detailed View):

Order	Medication	Infusion Rate	Route	Admin Time	Last Action	Last Site
5.8	ALBUTEROL 2.5 MG/3ML, NEB, SOLN	2.5mg	INTRAVENOUS	11/28/2010 17:00	GIVEN	4/4/2014282401
5.8	ALBUTEROL 2.5 MG/3ML, NEB, SOLN	2.5mg	INTRAVENOUS	11/28/2010 21:00	GIVEN	4/4/2014282401
5.8	ALBUTEROL 2.5 MG/3ML, NEB, SOLN	2.5mg	INTRAVENOUS	11/28/2010 22:10	GIVEN	4/4/2014282401

Annotations:

- As Of button:** Located in the top right of the medication administration log window.
- Icon indicates orders for nurse review:** A yellow icon in the Time View grid.
- Icon indicates a patient's care plan:** A blue icon in the Time View grid.
- Icon indicates a temporary notation:** A green icon in the Time View grid.

Current Process

Silo'ed with a thread of orders



Ordering provider



Pharmacist



Nurse



Patient



Design for the Ecosystem

Silo'ed... with disconnected information



Design for the Ecosystem

Understand the interdisciplinary work, provide cognitive support, integrate processes





**Message #3:
Design for Situation Awareness**

eMAR Current Process

The screenshot displays the eMAR (Electronic Medication Administration Record) interface. It features a patient information header for 'Fish, Broiled' (MNO 00010918) and a 'Medications' section. The medication list includes:

- Levodopa** (Levodopa Meds): 25 mg PO, TAB, BID, 11/20/19 12:00. A red icon indicates orders for nurse review.
- Levodopa** (Levodopa Meds): 25 mg PO, TAB, BID, 11/20/19 21:00. A red icon indicates a patient's care plan.
- Levodopa** (Levodopa Meds): 25 mg PO, TAB, BID, 11/20/19 21:00. A red icon indicates a temporary rotation.

Other visible elements include a 'Patient Case Summary' menu, a 'Medications' table with columns for Name, Strength, Route, and Frequency, and a 'Medication Administration' table with columns for Date, Time, and Status. A 'Patient Care Summary' window is also open, showing a list of medications and their administration status.



Nurse



Patient

Orders



eMAR Current Process

Nurse forages for information

Handoff Info

Med Info

Fish, Broiled MWN 00018918 DOB 5/17/1988 Age 21 years Sex Female

20 November 2010 14:43 - 30 November 2010 14:43 (Clinical Hanger)

Time View	Medications	11/29/2010 17:00	11/29/2010 21:00	11/29/2010 01:30	11/29/2010 07:30
Schedule	Chlorzoxiprone (Chlorzoxiprone Meds)				
Chlorzoxiprone	25 mg PO, SOLUTION QID, 11/29/10 12:00, except when sleeping				
Continuous Infusions	Albuterol				
Albuterol	2.5 mg NEB, Ureaq, 11/29/10 07:30				
Medications	Metoprolol (Metoprolol Meds)				
Metoprolol	25 mg PO, TAB, BID, 11/28/10 21:00				
Metoprolol	25 mg PO, TAB, BID, 11/28/10 21:00				
Metoprolol	25 mg PO, TAB, BID, 11/28/10 21:00				

Annotations:
- Icon indicates orders for nurse review
- Icon indicates a patient's care plan
- Icon indicates a temporary rotation

Patient & EHR Info (labs, vital signs, etc.)



Patient Status

Nurse

Patient

Orders



Design for Situation Awareness

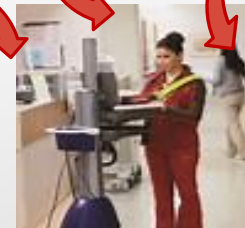
- Support situation awareness
 - What is my patient's status *now*?
 - What is the status of my patient's meds *now*?
 - What is **pertinent information**?
 - For this activity?
 - For this unit, patient, setting?
 - What is the **intersection**?

Patient Info (labs, vital signs, etc.)

Handoff Info



Med Info

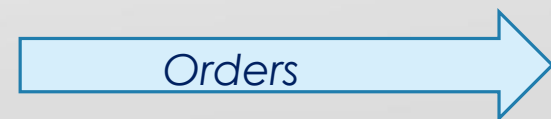


Patient Status

Nurse

Patient

Orders



Start with Workflow and Best Practices

The image displays two tablets illustrating a medication administration workflow. The left tablet shows a patient list for 'NEW HEAVEN CARE CENTER' with details for Marie Occam, Jim Snow, Bruce Lee, and Saul Bass. A medication schedule grid is visible below, with a callout highlighting a medication icon and status indicators (warning, lock, and clock). The right tablet shows a detailed medication schedule for Saul Bass, with callouts highlighting the medication name 'Insulin, aspart 10UN/ML', dosage instructions 'Dosage: per Prototol, QID-100', and a schedule control interface for 8:00 and 11:00 AM.

Medication Administration Interface (Left Tablet):

- NEW HEAVEN CARE CENTER Medication Administration Jane Moore
- June 10, 2014 08:00 - June 10, 2014 20:00
- Marie Occam 21 SSN: 12312455342 DOB: 1/1/1936 (89) Height: 163cm, Weight = 77.96kg
- Jim Snow 22 SSN: 12312455342 DOB: 1/1/1936 (89) Height: 163cm, Weight = 77.96kg
- Bruce Lee 24 SSN: 12312455342 DOB: 1/1/1936 (89) Height: 163cm, Weight = 77.96kg
- Saul Bass 25 SSN: 12312455342 DOB: 1/1/1936 (89) Height: 163cm, Weight = 77.96kg

Medication Schedule (Right Tablet):

- NEW HEAVEN CARE CENTER Medication Administration 8:08 AM
- Saul Bass 25 SSN: 12312455342 DOB: 1/1/1936 (89) Height: 163cm, Weight = 77.96kg
- Insulin, aspart 10UN/ML
Dosage: per Prototol, QID-100
BS: <140=none
140-179=1 Unit
180-219=2 Units
220-259=3 Units
260-299=4 Units
300-339=5 Units
340-379=6 Units
380-419=7 Units
420-459=8 Units
>460 = 9 Units
- Docusate NA 50mg/Sc
Dosage: TWO (2) 1

Schedule Control (Right Tablet Callout):

- Schedule
- 8:00 [Medication Icon] [Toggle]
- 11:00 [Medication Icon] [Toggle]
- 14:00 [Medication Icon] Insulin, aspart 10
Dosage: per Pr
BS: <140=no
140-179=

Design for Situation Awareness

Data Visualization

The screenshot displays a complex medical software interface for patient care. The main window shows a patient's name, 'Fish, Broiled', and a list of medications. A 'Time View' section on the left shows a timeline of events, with icons indicating orders for nurse review, patient care plan, and temporary notation. The interface includes various data tables, charts, and navigation menus, illustrating the need for clear data visualization in a high-stakes environment.



Contact Information

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