

Re-Design of EHR Screens and Data Elements to Optimize Use by Providers

ABSTRACT

Data quality issues are a major obstacle to the effective implementation and use of new EHR clinical data sources in the Vermont Children's Hospital (VCH), which is a National Association for Children's Hospitals and Related Institutions-accredited children's hospital within Fletcher Allen Health Care. An interdisciplinary EHR User Group partnered with the Jeffords Quality Institute to identify and address data quality and consistency issues for newborns and infants within the EHR as well as within their own clinical processes. The means and mechanism to overcome these data quality problems included:

- Identification of inconsistencies in data field use through manual and electronic matching audits (human factors analysis);
- Created a data field documentation tool to track and compare data element use throughout the various screens, flow sheets and outputs used by nurses and physicians (design element tracking);
- Identified the need for comparison reports to track inconsistent data recording patterns (data content quality); and
- Development of a structure for ongoing data extracts for patient results to use for education of residents and attending physicians to improve clinical quality (data quality process improvement).

BIOGRAPHY

Paul T. Rosenau

Vermont Children's Hospital Director for Quality
Vermont Children's Hospital at Fletcher Allen Health Care

Paul Rosenau is the Vermont Children's Hospital Director for Quality and a practicing pediatric hospitalist in the University of Vermont Medical Group. He received his Doctorate of Medicine from Harvard Medical School in 2004, his Master of Science degree in Pollution Prevention and Cleaner Production from University of Massachusetts Lowell in 2003 and his Bachelor of Arts degree from Middlebury College in 1995. He completed his pediatric training with the University of Vermont Pediatric Residency Program in 2007.



Michael E. Nix

Clinical/Operations Measurement Group Manager
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Michael Nix is Manager of the Clinical and Operations Measurement Group of the James M. Jeffords Institute for Quality and Operational Effectiveness at Fletcher Allen Health Care, Burlington Vermont. With an academic background in Industrial Management (University of Alabama) and Systems Management (University of Southern California) he has worked for thirty one years in healthcare including quantitative analysis, quality management, clinical operations analysis, consulting, material management as well as general hospital data collection and distribution. He has also taught a variety of business, management and finance courses at the college level for over 24 years and is currently a Graduate Faculty member as well as a part-time Adjunct instructor at Champlain College in Burlington Vermont teaching Financial and Economic Modeling in both their undergraduate and MBA programs.

Hannah Avarraschild

Measurement Support Associate
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Hannah Avarraschild is a Measurement Support Associate within the Clinical and Operations Measurement Group of the Jeffords Institute for Quality at Fletcher Allen Health Care who provided technical support for the project. She came to the Measurement Group in 2004 after retirement from IBM and prior to that a career in the US Army. She is a 2007 winner of the Jeffords Institute Quality Cup Award as the outstanding member of the Institute staff. She also active in a number of community and national charities as well as being a long time volunteer at Fletcher Allen Health Care.

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Fletcher Allen Health Care
Burlington, Vermont



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Our Vision

Fletcher Allen Health Care

Is committed to being a national model for the delivery of high-quality academic health care for a rural region



About Fletcher Allen

- 620 Licensed Bed Academic Tertiary Care Medical Center located in Burlington, Vermont
- Affiliated with University of Vermont College of Medicine
- Operates the **Vermont Children's Hospital** as a "Hospital within a Hospital"
- EPIC based EHR system "Inpatient go live" – June 2009 – our system is named **"PRISM"**
- **"PRISM"** implementation completed in Clinic settings in November, 2010



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Statement of EHR Challenges

- EHR's systems are inherently complex
- A classic clash of cultures & tribal approaches (clinical vs. computer personalities)
- EHR screens tend to be very intense and visually overwhelming
- Inconsistencies in data identification can lead to very diverse issues
- EHR's are configured by humans!



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EHR Design & Build Considerations

“To err is human, but to really foul things up requires a computer.”

~*Farmer's Almanac*, 1978



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Our Situation

- Pediatric clinicians were having trouble with certain aspects of PRISM
- Intuitive understanding that data wasn't consistently accurate due to design inconsistencies
- Hospital still in roll out mode – couldn't devote EHR implementation resources to fixes yet
- Decided to figure out the solutions themselves



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What Does a Typical EHR Screen Look Like? - A Sample Flow Sheet

Acetate, Lucy DOB: 9/20/1984 Rm-Bed: * B5CNOL/ * Att MD: STITCH, MART * Code: Full Code Isolation: MRN: 71218 Age/Sex: 15 y.o./F Pt Class: * IP Visit #: None Allergies: No Known All * Infection: (None)

Doc Flowsheets

File Add Row Add Group Add LDA Cascade Add Col Insert Col Device Compact Last Filed Graph Details Go to Date More

Flowsheet: Peds VS Simple Peds VS Simple Peds Assessment Peds I/O IV Assessment Daily Care Transfusion

		Admission (Current) 04/23/10 Current Unit: Fletcher Allen VT Children's			
		4/23/10		4/24/10	
		1958	2030	0000	0359
Vital Signs					
Temp		38.1 (100.5)	37.7 (99.8)		37.4 (99.4)
Temp src		*Oral	*Oral		*Oral
Pulse		70	66		72
Pulse / HR source					
Resp		22	22		24
BP		112/72	108/68		110/68
BP Device					
Patient Position		Sitting	Supine		Supine
BP Cuff Location					
Height and Weight					
Height					
Weight					
Type of Scale					
Head Cir					
BSA (Calculated - sq m)					
BMI (Calculated)					
Print Calculation.Weight					

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Another Typical Screen A Sample Medication Administration Record (MAR)

Acetate, Lucy DOB: 9/20/1984 Rm-Bed: * B5CNOL/ * Att MD: STITCH, MART * Code: Full Code Isolation: MRN: 71218 Age/Sex: 15 y.o./F Pt Class: * IP Visit #: None Allergies: No Known All * Infection: (None)

Arrivals

Peds Arrival Manage Orders

Patient Arrival

New Reading | Go to Doc Flowsheets

No data found.

Active LDAs

Go to Doc Flowsheets

All Active LDAs Remove All Now

Wound 01/29/09 Incision Umbilicus:

Wound Properties Date First Assessed/Time First Assessed: 01/29/09 1000 Wound Remove Now
 Type: Incision Location: Umbilicus

Wound 01/29/09 Incision Abdomen Mid/Low:

Wound Properties Date First Assessed/Time First Assessed: 01/29/09 1000 Wound Remove Now
 Type: Incision Location: Abdomen Wound Location Orientation: Mid/Low

Wound 01/29/09 Incision Abdomen Lower/Right:

Wound Properties Date First Assessed/Time First Assessed: 01/29/09 1000 Wound Remove Now
 Type: Incision Location: Abdomen Wound Location Orientation: Lower/Right

Peripheral IV 01/29/09 Left:

IV Properties Placement Date/Time: 01/29/09 0600 Orientation: Left Location: Remove Now
 Hand Inserted by: Inserted by RN Insertion attempts: 1 Local Anesthetic: None

Go to Doc Flowsheets

Patient Profile

Patient Profile

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VCH Director for Quality

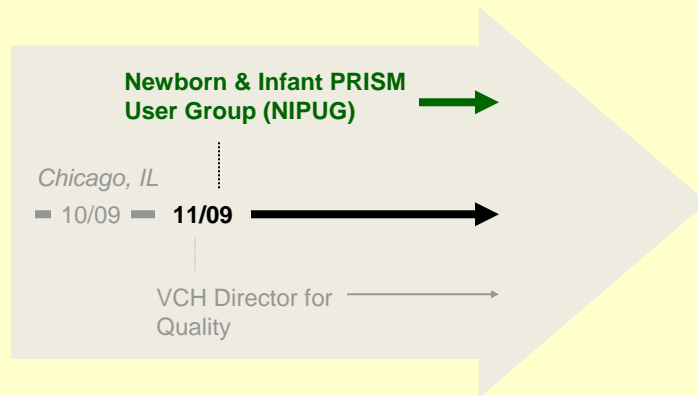


Tell me this isn't happening...

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First Activities



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So What Was The Issue?

- Elements in different places and they were not always the same data!
- A simple example
 - The head circumference of a newborn is very important information but doctors and nurses were not seeing the same information
 - When MDs saw blanks they thought data wasn't recorded or available
 - Nurses saw data that MD's didn't & vice versa!!



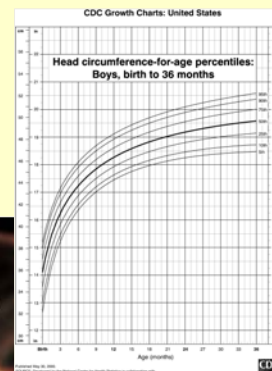
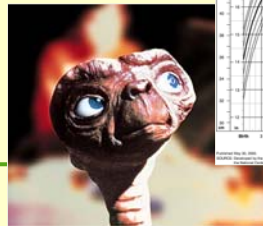
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Row Harmonization

What is this infant's head circumference?
An operational/informatics challenge

- Standard measurement for all infants
- Frequently does not appear in the growth chart
- Does not appear in commonly used PRISM reports



PRD-Fletcher Allen - SVC PEDIATRICS

Desktop Action Patient Care HIM Reports Tools Help Reference Links

Patient Lists Schedule In Basket Patient Station Chart Today's Pts Pre-Proc

Epic Home

MRN: Age/Sex: Rm-Bed: Pt Class: Visit #: *Code: not on le Allergies: No Known All

Doc Flowsheets

File Add Row Add Group Add LDA Cascade Details Values By Refresh Legend Chart Correction

Flowsheet Expected Discharge Peds VS Simple Peds Assessment Peds I/O IV Assessment

Expected Discharge Admission PAM
3/14/10 3/24/10
Expected Discharge

It is difficult to find where *head circumference* is documented

It is not in:

- NB Assessment
- NB Daily Care
- NB VS

PEWS
Combined Critical Care
Shift Check - ICU
Adult ICU Head to Toe
Patient Arrival
First Contact Information
Q2H Check - ICU
Ventilator **RT ONLY**
Pediatric ICU Assessment
Family Communication
Fall Risk Interventions
Unit Orientation
Psychosocial
ADL Screen
Immunizations
Nutrition
Peds Elimination
RT Treatments **RT ONLY**
RT Assessments **RT ONLY**
Discharge Planning
PICU Shift
Pediatric ICU Vitals
I/O
Pediatric ICU Daily Cares
PICU Hourly
RT/RN Admin
Spiritual Care
First Central Line Insertion - RN
Peds LNA Vitals, I/O
Adult Combined Assessment
Devices Testing Template
Adult ICU Vitals
Restraints - Med/Surg
PICU Hourly

Understanding the Problem Was Crucial To Solving It

- Complexity of the screens was a factor – many screens had 50+ elements (fields, labels, tabs, drop downs, etc.)
- Sheer number of different screens in pediatric medicine environment made visualization difficult
- Diversity of care providers environments – Nurse screens looked different than MD screens, etc.

You Can't Fix What You Can't Describe

- The EHR system didn't have utilities to cross reference fields (limited Meta data)
- Pressing Needs:
 - To identify where same data elements were used in multiple locations
 - To identify when identically labeled elements were not same data
 - To understand hierarchy of data structures in screens used by caregivers
 - Understanding the differences in how various care providers were accessing data differently



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The Start – A Manual Inventory In Excel

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
EPIC Row ID	Consensus Action	New FlowSheets t1	New FlowSheets t2	New FlowSheets t3	PilotOut ordinal	FlowSheet ordinal	Keyword	ier	est	er	er	er	er	er	er	er	er	er	er	er	er	er	er	er	er	er	er	er	er	er	er
6	Keep					1	Vitals	Temp												Temp	n/a	85.6 °C	n/a								
7	Keep					2	Vitals	Temp												Temp	sto	n/a		Tympanic-T							
8						3	Assessm	CY												Pulse	n/a	Min	n/a								
30220						4	Assessm	CY												HEART RATE	source	n/a	n/a	Carotid,							
30240	Keep					5	Vitals	HR												HEART RATE	Heart Rate (monitor)	n/a	Min	n/a							
9	Keep					6	Vitals	PR												Resp	n/a	Min	n/a								
5						7	Vitals	CY												BP	n/a	Max Value 90	n/a								
30400388	Keep					8	Vitals	BP												BP Device	n/a	n/a			Machine,						



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Sample Clinical Data Element Analysis – Manual Excel Format

Flow Sheet Num	Flow Sheet Name	Grp ID	Group Name	Row ID	Row Name	Comments	
3041004058	Lactation Assessment	12155	Breast/Nipples	12156	Breast/Nipples (WDL)	Duplicate numbers due to row start removes	
3041004058	Lactation Assessment	12155	Breast/Nipples	12157	Left Breast		
3041004058	Lactation Assessment	12155	Breast/Nipples	12157	Left Breast		
3041004058	Lactation Assessment	12155	Breast/Nipples	12158	Right Breast		
3041004058	Lactation Assessment	12155	Breast/Nipples	12158	Right Breast		
3041004058	Lactation Assessment	12155	Breast/Nipples	12159	Left Nipple/Areola		
3041004058	Lactation Assessment	12155	Breast/Nipples	12159	Left Nipple/Areola		
3041004058	Lactation Assessment	12155	Breast/Nipples	12165	Right Nipple/Areola		
3041004058	Lactation Assessment	12155	Breast/Nipples	12165	Right Nipple/Areola		
3041004058	Lactation Assessment	12155	Breast/Nipples	12166	Intervention		
3041004058	Lactation Assessment	3041000474	Latch	3041000474	Latch		OK
3041004058	Lactation Assessment	3041000825	Feeding Assistance	3041000825	Feeding Assistance		OK
3041004058	Lactation Assessment	3041000840	Position	3041000840	Position		OK



The Excel Approach

- Enabled working team to collaborate on specifics – a big plus!!
- Allowed a lot of technical system “build” knowledge to develop
- Became a focal point for identifying issues
- The Big Negative - Quickly became cumbersome, not very good for advanced needs (queries, sorts, etc.) even when refined!!



The Next Step – An Interactive Database

Main Switchboard

Pedi Prism

- Rows Associated Paths
- Open Rows 1
- Open Rows 2
- Edit Rows Dictionary Table
- Edit Can Change Users Table
- Edit Keywords
- Exit Access



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Building A Structure To Understand The Data

Pedi Prism Path Form

Flow Sheets: 21,209

Groups Associated with Selected Flow Sheet

ID	Display Name	OSR	Gr	Ord	Int
305510	Assessment	N	1	1	No
2960	Unit to collect Blood?	N	1	2	No
2942	Post Op Drw	N	1	3	No
3041000149	Neurological (WDL)	N	1	4	No
3041000148	Neurological	Y	1	5	No
495050	Seizure Activity	Y	1	6	No
481500	Reflexes	Y	1	7	No
180349	Glasgow Coma Scale (0 to 12 mo)	Y	1	8	No
180348	Glasgow Coma Scale (12-36 mo)	Y	1	9	No
17051	Glasgow Coma Scale (>36 months)	Y	1	10	No
304450	HEENT (WDL)	N	1	11	No
1988	Cardiac	N	1	12	No
300230	Edema	Y	1	13	No
1917	Peripheral Pulse	Y	1	14	No
1934	Cardiac Monitoring	Y	1	15	No
305410	Respiratory (WDL)	N	1	16	No
300900	Respiratory	Y	1	17	No
305490	Cough	Y	1	18	No
305490	Cough	N	1	19	No
305491	Cough Description	Y	1	20	No
400636	Non-Surgical Airway	Y	1	21	No
7070173	Surgical Airway	Y	1	22	No
3041000175	Airway Suction	Y	1	23	No
1945	Gastrointestinal (WDL)	N	1	24	No
1981	Gastrointestinal	Y	1	25	No
3041000144	Bowel Sounds	Y	1	26	No
1947	Gastrointestinal	N	1	27	Yes
400427	CVA Tenderness	Y	1	28	No
204420	Musculoskeletal (WDL)	N	1	29	No
300050	Musculoskeletal	Y	1	30	No
300040	Musculoskeletal Details	N	1	31	No
2007	Musculoskeletal Cast/Splint	Y	1	32	No
2014	Musculoskeletal Cast/Splint 2	Y	1	33	No
2024	Musculoskeletal Cast/Splint 3	Y	1	34	No
2101	Fracture Device	Y	1	35	No
7073830	CPM Left Knee	Y	1	36	No
7073840	CPM Right Knee	Y	1	37	No

Rows Associated Selected Flow Sheet/Group Combination

ID	Display Name	OSR	Gr	Ord	Int	
305410	Respiratory (WDL)	N	1	1	No	
305410	Respiratory	N	1	2	No	
305490	Cough	N	Y	1	3	No
305491	Cough Description	N	Y	1	4	No
3041000175	Airway Suction	N	Y	1	5	No

Sub Rows Associated Selected Flow Sheet/Group/Row Combination

ID	Display Name	OSR	Gr	Ord	Int
302570	Respiratory Pattern	N	1	1	No
302580	Chest Assessment	N	1	2	No
302590	Breath Sounds Bilateral	N	1	3	No
302610	Breath Sounds L	N	1	4	No
302600	Breath Sounds R	N	1	5	No



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On the **Newborn Assessment** flowsheet...

in the **Newborn Vitals** group...

is a row called **"Head Cir"**, where one can chart head circumference

Microsoft Access - [Pedi Prism Main Form]

File Edit View Insert Format Records Tools Window Help

Flow Sheets FlowSheetNumber 304100165001 Add FS Remove Selected FS Edit Selected FS Access Rows Dictionary Close Form an

Add Group to Selected FS Remove Selected Grp from Selected FS Rows/Sub Rows Row Associations Duplicate Disp Names Row Data Keywords

Groups Associated with Selected Flow Sheet		
ID	Display Name	GSR
3041000846	Bottle Feeding	0
3041000475	Breast Feeding?	0
3041000475	Breast Feeding?	0
3041000857	Breast Pump?	0
3041000871	Chest/Abdomen	0
3041000876	Extremities	0
3041000874	Genitalia/Perianal	0
3041000867	HEENT	0
3041000862	Integument	0
3041000860	Neurological	0
304100170601	Newborn Discharge Criteria	0
304100170101	Newborn General	0
3041003419	Newborn Spine	0
3041003421	Newborn Trunk	0
3041000469	Newborn Vitals	0
3041000478	Output	0
3041000864	Reflexes	0

Rows Associated Selected Flow Sheet/Group	
ID	Display Name
5	BP
301300	BP Cuff Location
301360	BP MAP
16	Head Cir
11	Height
3041000470	Isolette Temp
3041003740	Mom/Baby Bracelet #
8	Pulse
9	Resp
10	SpO2
3041000471	State
6	Temp
7	Temp src
14	Wt - Scale

Add Sub Row to Sel FS/Grp/Row Remove Sel Sub Row from Sel FS

On the **Newborn Assessment** flowsheet...

in the **Newborn General** group...

is a row called **"Head Circumference"**, where one can chart head circumference

Microsoft Access - [Pedi Prism Main Form]

File Edit View Insert Format Records Tools Window Help

Flow Sheets FlowSheetNumber 304100165001 Add FS Remove Selected FS Edit Selected FS Access Rows Dictionary Close Form an

Add Group to Selected FS Remove Selected Grp from Selected FS Rows/Sub Rows Row Associations Duplicate Disp Names Row Data Keywords

Groups Associated with Selected Flow Sheet		
ID	Display Name	GSR
3041000846	Bottle Feeding	0
3041000475	Breast Feeding?	0
3041000475	Breast Feeding?	0
3041000857	Breast Pump?	0
3041000871	Chest/Abdomen	0
3041000876	Extremities	0
3041000874	Genitalia/Perianal	0
3041000867	HEENT	0
3041000862	Integument	0
3041000860	Neurological	0
304100170601	Newborn Discharge Criteria	0
304100170101	Newborn General	0
3041003419	Newborn Spine	0
3041003421	Newborn Trunk	0
3041000469	Newborn Vitals	0
3041000478	Output	0
3041000864	Reflexes	0

Rows Associated Selected Flow Sheet/Group	
ID	Display Name
304100170201	Circumcision Performed
12236	Head Circumference
12235	Length
12234	Weight

Add Sub Row to Sel FS/Grp/Row Remove Sel Sub Row from Sel FS

Actually **"Head Cir"** occurs on 5 flowsheets

under 3 different group names...

...one of which is hidden at flowsheet startup

Grp ID	Grp Disp. Name	Grp S/R	FS ID	FS Disp. Name
3041000465	Measurement and Growth		46613	NICU VS
3041000469	Newborn Vitals		304100000011	NB VS
3041000469	Newborn Vitals		304100165001	Newborn Assessment
344310	Height and Weight		304100150801	Pediatric ICU Vitals
344310	Height and Weight		33070	Peds VS Simple



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NIPUG reviewers have found a true redundancy in competing rows

Similar Row Group Name	ID	Display Name
Head Circumferences	16	Head Cir
Head Circumferences	12236	Head Circumference



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Tracking That "Head Circumference" Problem

Logging the inconsistency

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Detailing the "Details"

Drilling into one of the head circumference data elements

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Blowup of Catalog of Field Uses & Properties

Dictionary Row Comments

Row Description
Head circumference (or occipital frontal circumference) is measured over the most prominent part on the occiput, just above the supraorbital ridges.

Project Comments
Unclear if this one or 16 ("Head Cir") has the preferred data properties [PTR]

Min Value: 0 Max Value:

UNIT:

Clinical Contact:

Keep: Status: 1

Unit(s) where used routinely	Unit(s) where rarely, if ever, used
<ul style="list-style-type: none"> Baird 5 Children's Specialty Center Comfort Zone Emergency Department Labor and Delivery Newborn Nursery NICU NTS Operating Room PACU PICU Procedure Room University Pediatrics 	<ul style="list-style-type: none"> Baird 5 Children's Specialty Center Comfort Zone Emergency Department Labor and Delivery Newborn Nursery NICU NTS Operating Room PACU PICU Procedure Room University Pediatrics

Developing Detail



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Developing A Data Hierarchy Model

Rows 1

Close Form Search by ID: 12236 Search by Name: Head Circumference

Lists and comments Row Data Keywords Similar Rows Comments by Path Program use fields

Category	Tier 1	Tier 2	Tier 3
<ul style="list-style-type: none"> Patient Assessment Patient Demographics, History, and Care Patient Measurement Patient Treatment Processes of Care Quality Measurement Unit/Hospital Intervention 	<ul style="list-style-type: none"> Cognitive Equipment Pain Physiologic system/Problem/Physical ex. POC labs Safety Screening tests Specimen/sample assessment 	<ul style="list-style-type: none"> Gastrointestinal General Genitourinary Lactation Mental status Mobility, non-ADL Musculoskeletal (not spine) Neonatal abstinence syndrome Neurological (not spine) Nutritional Dental/orofacial 	<ul style="list-style-type: none"> Neurological index

Add Selected Hierarchy to Row

Category	Tier 1	Tier 2	Tier 3
▶ Patient Measurement	Size	Body part measurement	
▶ Patient Measurement	Size	Head circumference	
*			

Record: 14 of 2



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Making Recommendations for Changes

Add Group to Flow Sheet

Epic Row ID:

Epic Display Name:

Group Start Remove: Ordinal:

Add Existing Group to Flow Sheet

Epic Row ID:

Epic Display Name:

Pick Group UID:



Display of User Designed Flow Sheets

Pedi Prflm Path Form

Flow Sheets: FlowSheetNumber: Add FS Retrive Selected FS Edit Selected FS View Row Related Details Open Rows Dictionary Table Close Form

Build Gp to Select FS Existing Gp to Select FS Gp (FS) Ordinals Select Gp Select FS

Groups Associated with Selected Flow Sheet

ID	Display Name	Grp	Ord	Act
7096360	Provider Notification	N	1	No
309510	Assessment	N	2	No
2961	Unit to collect Blood?	N	3	No
3943	Post Op Day	N	4	No
P-2915	Neurological	N	5	No
30410017001	Glasgow Coma Scale	N	6	No
P-3029	HEED	N	7	No
P-2960	Cardiac	N	7	No
P-2963	Respiratory/Chest Assessment	N	8	No
P-2964	Gastrointestinal	N	9	No
P-2986	Genitourinary	N	10	No
P-2967	Musculoskeletal	N	11	No
336003	Skin (WCL)	N	12	No
P-2966	Psychosocial	N	13	No
7091930	Braden Q Scale	N	14	No
3041000325	Morley's Fall Assessment	N	15	No
3041000381	Fall Risk Interventions	N	16	No
30403004001	Cardiac Monitor	N	17	No
7060290	Precautions	N	18	No
70600100	Safe Environment	N	19	No
7060810	Safety Equipment at Bedside	N	20	No
3041000382	Mobility	N	21	No
340360	Comfort and Hygiene	N	22	No
706040	Nutrition	N	23	No
7060430	Family/Significant Other Communication	N	24	No
P-2902	Education and Care Plan	N	25	No
7070003	Entertainment	N	26	No
7070004	Hospital Schooling	N	27	No

Rows/Sub Rows Comments by Path Program Use Only Fields

Create P Row & Add to Sel FS/Grp Add Existing Row to Sel FS/Grp Row (Grp) Ordinals Remove Sel Row from Sel FS/Grp

Rows Associated Selected Flow Sheet/Group Combination

ID	Display Name	Grp	Ord	Act
304100176001	Glasgow Coma Scale	N	1	No
160249	Glasgow Coma Scale (0 to 12 mos)	N	1	No
160345	Glasgow Coma Scale (12-36 mos)	N	1	No
17051	Glasgow Coma Scale (>36 months)	N	1	No

Add Sub Row to Sel FS/Grp/Row Sub Row (Row) Ordinals Remove Sel Sub Row from Sel FS/Grp/Row

Sub Rows Associated Selected Flow Sheet/Group/Row Combination

ID	Display Name	Grp	Ord	Act



Lessons Learned

- Figuring out problems after EHR build and implementation depends on systematic analysis – data quality must be “built”
- Sometimes you have to build your own analysis tools to understand data structures
- Clinician can understand data structures and problems associated with data structures in EHR’s (shock)!!



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Lessons Learned (cont)

- Hindsight is 20/20 – accept it and use it because “Foresight” is pretty much a white cane – get over it!!
- Understanding complex data systems requires people who understand data structures – not a common trait of clinicians when being asked to make configuration decisions
- You can’t anticipate the ramifications of all build decisions



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Lessons Learned (cont)

- The process of building a data structure cataloging tools helped expand understanding of data needs – the journey shapes the final approach
- Good EHR configuration design is inherently an iterative process between computer types and clinicians – neither can dominate!



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Lessons Learned (cont)

- Each EHR environment is somewhat unique so no one has a complete “out of box” solution – **how you make it your own is important to the ultimate success of the system !!**



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Thank You For Your Attention

Questions??



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Contact Information

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