

# Dawning of a New Epoch in Harm Measurement

From Paleolithic Hunter Gathers  
to Holocene Farmers

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(This presenter has nothing to disclose)



# Objectives

- Implement strategies to leverage new EMRs to make action on harm visible and actionable within 48 hours or less
- Share a cutting-edge method for comprehensive, near real-time harm measurement
- Engage you in a journey to re-invent harm measurement

# Goal of HARM 2.0

- Comprehensive tracking of harm by Oct 2015 with data within 48 hours of triggering documentation with no human intervention.
- Harm may include iatrogenic vulnerability as well as harm requiring additional treatment

# Real Goal of Program

- Give tools for insight and action to front line staff and middle management.
- Make gaps in care visible and actionable
- Make not testing changes seem very uncomfortable.

# What is Comprehensive?

- **Medication**
  - Hypoglycemia
  - Anticoagulation issues (INR > 5)
  - Narcan
  - Diuretics causing adverse effects
  - Allergic Reaction not POA
  - C-diff toxin positive
  - Delirium
  - GI Bleed not POA
- **Environment**
  - Pressure Ulcer
  - Falls
  - Patient Trauma
- **Other**
  - DVT
  - Acute Renal Failure
  - Blue Alert
- **Procedural Complications**
  - Pneumothorax
  - Puncture/Laceration
  - Unexpected blood use post Procedure
  - Aspiration Pneumonia
  - Other Procedural complications
- **Infections**
  - SSI
  - CAUTI
  - CLABSI
  - Pneumonia
    - VAE
    - Other Pneumonia Not POA
- **Perinatal**
  - Ideal Delivery

# Meaningful Use and Available Data

## Traditional

- ICD9 Dx
- ICD9 PX
- Cpt4 (maybe)
- Limited Labs/cultures
- LOS
- Charges
- ADT locations
- Individual Charge master items

## EMR Era

- All Traditional
- Problem lists (maybe)
- Orders
- Medication Administration
- Vital Signs (limited)
- Flow sheet data
- Equipment feeds (maybe)

# What is Special about HFHS

- Problem based charting
- Long History of Quality Improvement
- Open Data Environment
  - Data Reporting & Analytics are not part of IT
- New EMR with all hospitals on the same build



# Problems in Paradise

- Definitions are far more complicated
- Audiences are different for data with new distribution channels
- Choices for where to find data
  - Comorbid Edema (from Flow Sheet?, problem list? Past ICD9 code, Medications?)



# What Have We Learned So Far?

- Timely delivery changes the intervention from the ground up
  - Related opportunities appear in the process
  - Some traditional measures not useful
- Predictive Analytics are not as valuable as actionable analytics
- Weakness in the data usually uncover other interesting opportunities in Patient Care

# What We are Learning

- Measurement becomes tightly coupled to the care-giving
- Design of the documentation is profoundly linked to data possibilities

# Delivery and Follow up

## Traditional

- Monthly reports to leadership
- Detail lists for deep dives
- Teams built around project and data from team out to staff

## EMR Advanced

- Detail to front-line
- Roll up with analysis to leadership
- Detail can be both for team and front line real time

# Detail from the Beginning

Pressure Ulcer Detailed Investigation on Hospital Acquired Pressure Ulcers							
Date of Review:		MRN:		Room #:			
Hospital Admit Date:		Unit Admit Date:		Date PU 1st documented:			
Pt had a PU on admission?		Admitting diagnosis:					
Unit discovered:		Unit acquired:		2 person assessment?			
Comorbidities: <input type="checkbox"/> Diabetes <input type="checkbox"/> HTN <input type="checkbox"/> ARF <input type="checkbox"/> Dementia <input type="checkbox"/> Steroids <input type="checkbox"/> HF <input type="checkbox"/> Radiation <input type="checkbox"/> Vasopressors <input type="checkbox"/> FIO2 > 50% <input type="checkbox"/> Vented <input type="checkbox"/> Other _____ <input type="checkbox"/> Edema: Location _____							
Site of Ulcer:	Stage at first	Stage today	Comments	Site of Ulcer:	Stage at first	Stage today	Comments
<input type="checkbox"/> Heel R	<input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> DTI <input type="checkbox"/> UTS	<input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> DTI <input type="checkbox"/> UTS		<input type="checkbox"/> Heel L	<input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> DTI <input type="checkbox"/> UTS	<input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> DTI <input type="checkbox"/> UTS	
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<input type="checkbox"/> Scrotum	<input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> DTI <input type="checkbox"/> UTS	<input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> DTI <input type="checkbox"/> UTS		What is the device? If ETT, what held it in place?			
Was patient off floor for >2 consecutive hours in 3 days prior to PU?			Date/time off unit/comment				
	Total Braden	Sensory	Moisture	Activity	Mobility	Nutrition	Friction
Day of PU							
PU -1							
PU -2							
PU -3							
Nutrition	Prevention Protocol Initiated? <input type="checkbox"/> Yes <input type="checkbox"/> No			Diet:			
	Nutritional Consult: <input type="checkbox"/> Yes <input type="checkbox"/> No			NPO for _____ hours (total)			
	TF @ goal: <input type="checkbox"/> Yes <input type="checkbox"/> No			Why?			
	Nutritional supplements ordered? <input type="checkbox"/> Yes <input type="checkbox"/> No						
Bed in Use:	Type of Surface Used: <input type="checkbox"/> Temperpedic <input type="checkbox"/> Flexicare <input type="checkbox"/> Versacare Foam <input type="checkbox"/> Versacare Air						
	Incontinent: <input type="checkbox"/> Urine <input type="checkbox"/> Stool <input type="checkbox"/> Foley?: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Diaper						
Turning:	Turned Q 2 hrs: _____ If no...why _____ <input type="checkbox"/> Wedge used for turns						
Heel Ulcer:	<input type="checkbox"/> Waffle Boots <input type="checkbox"/> Prevalon <input type="checkbox"/> Pillows						
Mobility:	<input type="checkbox"/> Pt was mobilizing to fullest <input type="checkbox"/> Pt was bedrest <input type="checkbox"/> PT/OT <input type="checkbox"/> Chair <input type="checkbox"/> Up with Assist <input type="checkbox"/> Up ad lib						
Conclusion:	<input type="checkbox"/> Were there obvious gaps in care? Specify: <input type="checkbox"/> Ulcer most likely began when pt off unit & where? <input type="checkbox"/> Other:						

# Example VTE Harm:

- Problem list (Added during stay)
  - *low resolution, non-Deep Vein, “at risk for vs real”, POA reliability*
- Treatment received (Heparin drip, etc)
  - *Logic to weed out a-fib, etc. used for Drip*
- Imaging results (CT, Venous Doppler and duplex) → *Order but No results available in Clarity*
- Heart problems (*Problem list ICD9 codes 410.xx and 427.xx*)
- Billing data (ICD9 code) *Not used in logic*
- Lab results *N/A*

# VTE is Really Complicated

- No single variable is good enough
- Treatment overlaps with other problems
- Numerous patients with Heparin or Lovenox and no legitimate problem on problem list

# Real-Time Method: Review

- Identification within 48 hours of documentation
- Real time identification through the artifacts of care
  - Problems list
  - Ordering a treatment/medication
  - Lab value
- Accuracy and reliability
- Insight into the variation of practice
- Organic system allows faster response to change

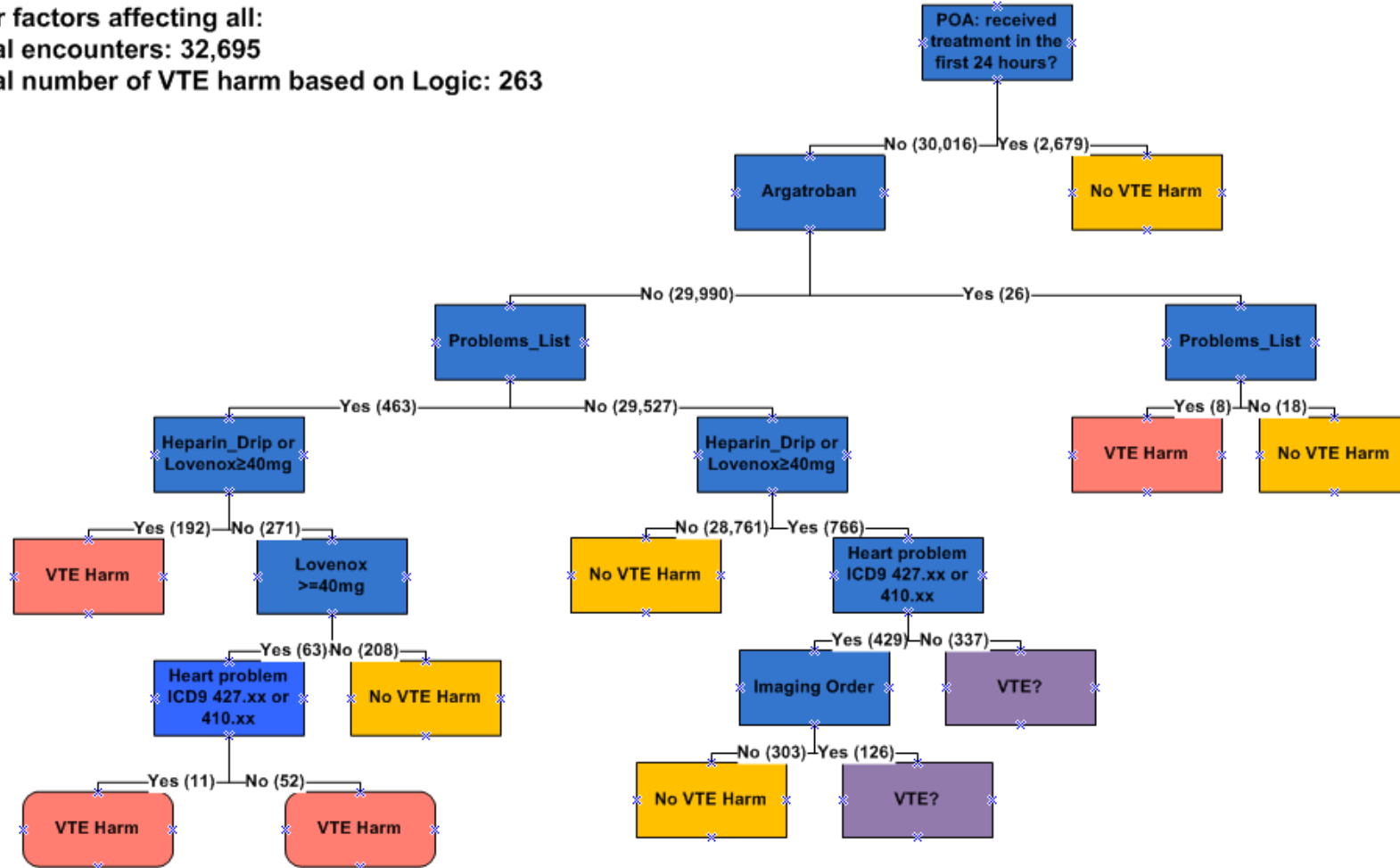


# DVT/PE Harm: Logic

Other factors affecting all:

- Total encounters: 32,695

- Total number of VTE harm based on Logic: 263



# VTE: Chart Reviews

- 427 Chart Reviews were done
- Comparison:

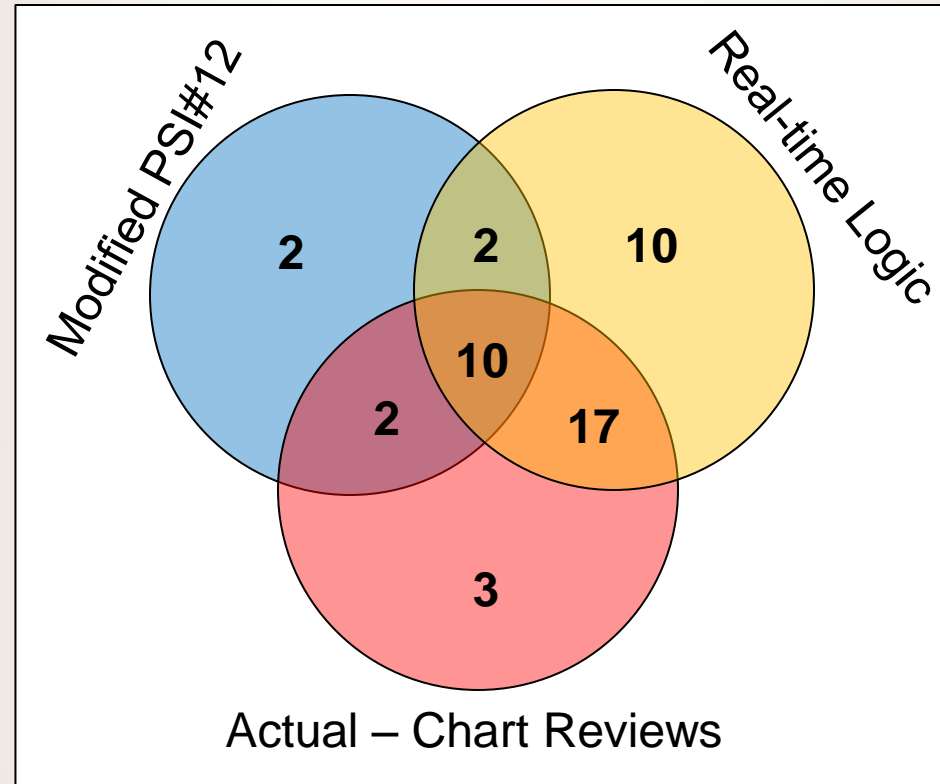
	Real Time Logic	Modified AHRQ PSI 12
Sensitivity	84%	37.5%
Specificity	97%	99.0%
PPV	69%	75%
NPV	99%	95%

- We are finding a little bit more, but wait!

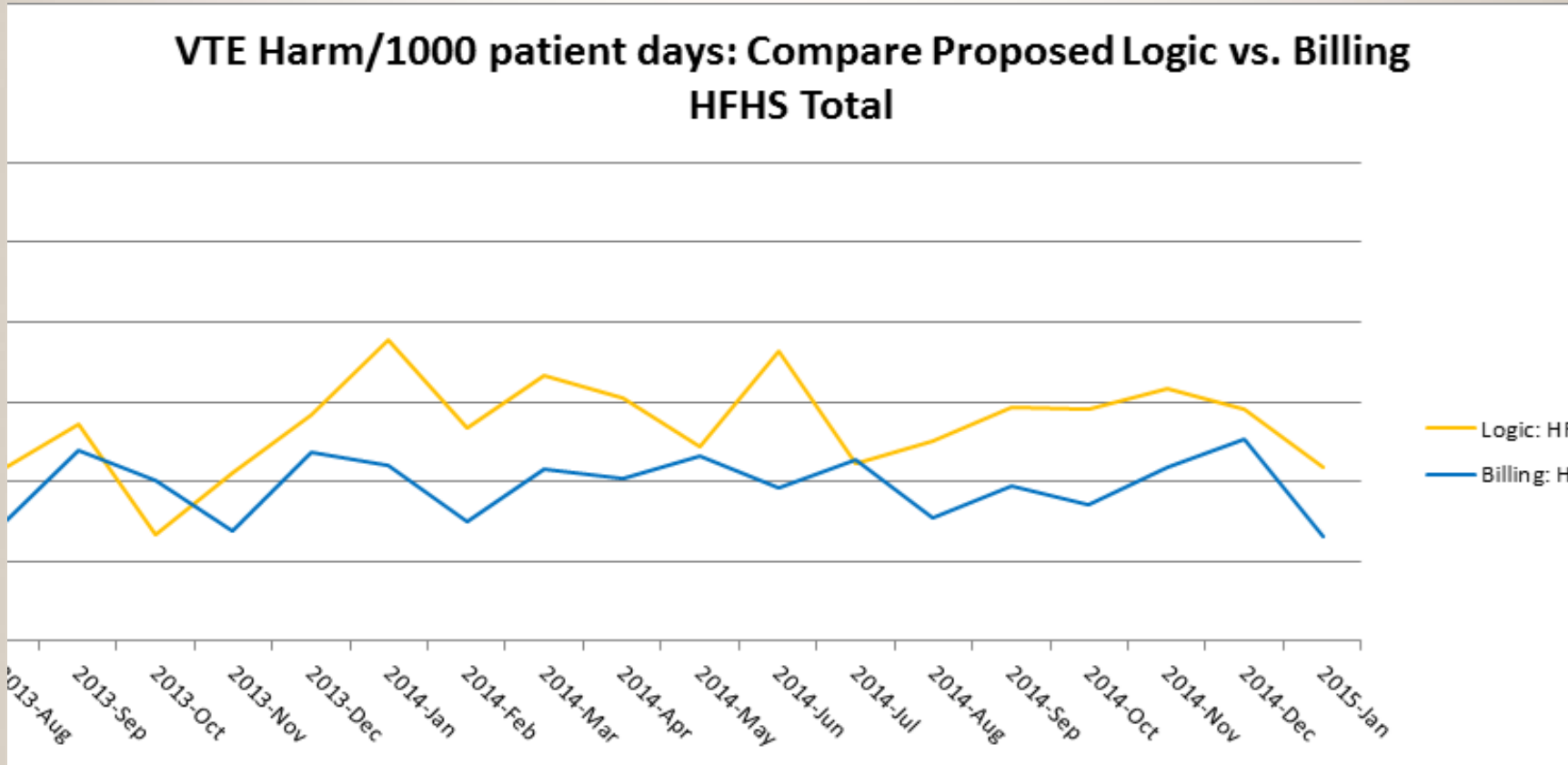
	Total	Dif.
Chart Reviews	32	0%
Proposed Logic	39	22%
Billing	16	-50%

- Improvement in documentation can significantly improve accuracy

# VTE Harm: Actual vs. Modified PSI#12 vs. Logic



# VTE Harm/1000 patient days: HFHS Total

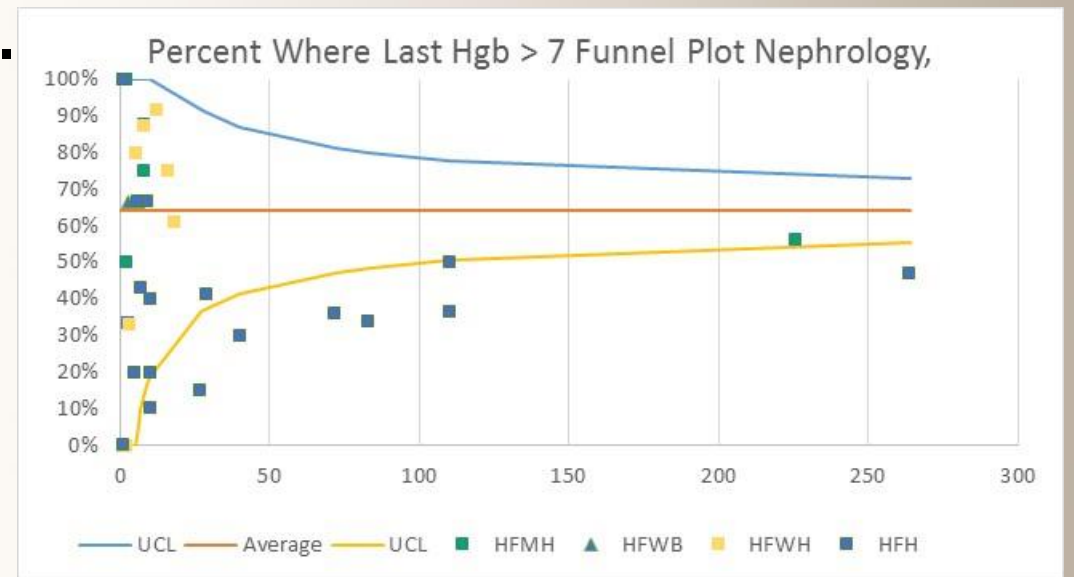


# Other Lessons and Data

- Failures in the measurement of DVT are tightly connected to practice issues
  - Building reports on use of Doppler & CT scans per found DVT (*resident project*)
  - Continued treatment of superficial vein clots needs feedback loop  
(*reached out to program director for resident education*)
- Timelines don't match
  - Date of discharge vs Date of problem in hospital
- Built estimate of Padua score from existing documentation

# Blood and Bleeding

- Teasing out unexpected drop in Hgb or blood use
- Linking bleeding with anticoagulants (INR > 5)
- Attempting to integrate tracking of bleeding with good management of blood products.



# Questions, Thoughts

- What excites you about this work?



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