The Ability of SNOMED CT to Capture Perinatal Process Concepts

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The State of Perinatal Care

• More than 4 million annual births
• Annual cost approximately $16 billion
• Current issues:
  – National focus on safety and quality
  – Increased medical intervention
• Tools to assess perinatal quality, such as P-FTR
Perinatal Data

• Complex medical records
• Customizable electronic systems
• No comprehensive source of perinatal data for research or quality assessment
Healthcare IT Agenda

• Meaningful use
  – Reimbursement vs. penalties
  – Focus on quality
  – Standards for electronic documentation
    • Use of standard terminologies
Standard Nursing Terminologies

- 12 are ANA-approved
- None widely deployed
- Little concentration on perinatal nursing concepts
  - Little identified research on standard language use in perinatal nursing
Failure to Rescue for Perinatal Care

• AHRQ endorsed process measurement tool
• Only 1 published study using the tool
  – Noted limitation inability to retrieve data
• Processes measured in 3 areas:
  – Expectations for careful monitoring and timely identification (of problems)
  – Appropriate interventions
  – Timely activation of a team response
Evaluating Appropriate Responses to Clinical Situations based on AHRQ’s (2003) Failure to Rescue Patient Safety Indicator (Adapted to Perinatal Care)

<table>
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<tr>
<th>Rescue Process Components</th>
<th>Yes</th>
<th>No</th>
<th>UTBD</th>
<th>NA</th>
<th>Comments/Additional Descriptions of Processes</th>
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<tr>
<td><strong>Expectations for careful monitoring</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For women/fetuses without identified risk factors</td>
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<tr>
<td>Every 30 min during the active phase of first stage labor</td>
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<td>% of 30 min time frames with assessment data</td>
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<td>Every 15 min during the active pushing phase of second stage labor</td>
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<tr>
<td>Every 15 min during the active phase of first stage labor</td>
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<td>Every 5 min during the active pushing phase of second stage labor</td>
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<td></td>
<td>% of 5 min time frames with assessment data or summary notes q 15 min indicating continuous bedside attendance and assessment during pushing</td>
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</table>

**Score**

<table>
<thead>
<tr>
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<th>1</th>
<th>2</th>
</tr>
</thead>
</table>

**Timely identification**

Within the timeframe outlined in the expectations for careful monitoring (e.g. q 30 min, 15 min or 5 min based on identified risk factors)

Time:

Accurate interpretation and appreciation of the implications of the clinical data displayed (based on agreement between medical record documentation and fetal monitoring strip)

Time:

Nonreassuring (indeterminate/abnormal) characteristics of the FHR pattern

List characteristics:

**Score**

<table>
<thead>
<tr>
<th></th>
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<th>1</th>
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</thead>
</table>

Kathleen R. Simpson, PhD, RNC, FAAN
Research Questions

• What are consensus definitions of the elements included in P-FTR?
• Can P-FTR elements be mapped to four ANA-recognized standard languages?
Study Design

• Exploratory study, with mixed methods
• Phase I: consensus definitions for P-FTR
  – Modified Delphi study
• Phase II: cross-mapping of defined P-FTR elements to ANA terminologies
  – Validation by expert panel
Results

• 29 participants in Phase I, 27 completed all three study rounds
  – 27 submitted demographic information

• At least 75% consensus on most P-FTR elements. Noted exceptions:
  – Laterality, provider notification, MVUs, documentation of non-reassuring fetal status
Phase II

- P-FTR elements (defined in Phase I) mapped to 4 nursing terminologies
  - Clinical Care Classification™ (CCC)
  - International Classification of Nursing Practice (ICNP®)
  - Logical Observation Identifiers, Names, & Codes (LOINC®)
  - Systemized Nomenclature of Medicine-Clinical Terms (SNOMED-CT®)
Rationale for Terminology Selection

• Previous use in nursing informatics research
• Defined semantic structure
• Specific search strategy
• Ability to access at no charge for research purposes
Cross-Mapping Results

- 76 individual concepts mapped
  - 63 (> 80%) in SNOMED-CT
  - 26 in ICNP
  - 21 in LOINC
  - 11 in CCC
Expectations for Careful Monitoring/Timely Identification

• 58 total concepts
• Consensus definitions for:
  – High and low risk maternal and fetal characteristics
  – Use of NICHD terminology
  – Uterine monitoring characteristics
  – Active labor elements
• No consensus for:
  – Terms to describe non-reassuring fetal status
  – Use of MVUs to describe contraction strength
Notable SNOMED Findings

- Hyperstimulation vs. tachysystole
- “Reassuring” as an intervention rather than a clinical finding
- NICHD Categories
- The concept of gestation
Appropriate Intervention

- 13 concepts
- Consensus definitions for:
  - Oxygen administration
  - IV bolus
  - Discontinuation of Oxytocin
  - Administration of Terbutaline
  - Amnioinfusion
  - Modified pushing efforts
- No consensus for
  - Laterality, provider notification
# Appropriate Intervention

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<th>Concept</th>
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<th>Column3</th>
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Activation of Team Response

• 5 Concepts
• Consensus definitions for:
  – Notification of provider
  – Decision for cesarean section
  – Notification of transport team
## Activation of Team Response

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<tr>
<th>Name</th>
<th>Value</th>
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<th>Definition Code</th>
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Expert Panel Validation

- Perinatal and informatics nursing experts
  - P-FTR author
  - Perinatal nurse participant from Phase I
  - Informatics nurse with perinatal clinical experience
  - Representative from SNOMED-CT responsible for perinatal content
  - Nursing informatics researcher with expertise in standard terminologies
Validation Sessions

• Mapping results sent to experts one week in advance
• Scheduling facilitated by Doodle®
• Virtual meetings facilitated by SCOPIA
  – Webcam and headset provided to panel members on request. Support through VICTR
Expert Panel Validation

- Participants asked to validate findings for:
  - Accuracy
  - Context
- 100% of findings validated, without exception
Implications

• SNOMED-CT may best represent P-FTR elements
  – Most elements related to intrapartum care are present
• Standardization essential for data retrieval and benchmarking
Next Steps

- Formal request to SNOMED-CT for incorporation of missing P-FTR elements
- Pilot testing for the ability to retrieve concepts from existing EDW
- Modeling and testing of P-FTR in electronic system
  - real time use of P-FTR for decision support
  - Process measurement vs. process validation tool
- Similar study format for other perinatal nursing elements
Questions?