Improving Patient Surveillance: Instituting a Respiratory Risk Screening Tool

Wyoming Medical Center

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Purpose

To share an evidence-based protocol that has been successfully embedded into the EMR to avert respiratory failure in patients who display signs and symptoms of respiratory compromise.
Problem

In 2010, a serious safety event occurred as a result of not intervening before the patient died from respiratory compromise.

Failure to Rescue Episode
Significance

Respiratory Failure is a life-threatening condition. As early as eight hours prior to a respiratory failure event, symptoms can be detected warning care providers that the patient is entering a crisis situation.
At Risk Populations

- ETOH/substance abuse
- Post sedation/anesthesia
- OSA (obstructive sleep apnea)
- Enteral feedings
- Vomiting and/or failure to manage secretions
- Sepsis, pancreatitis, heart failure, shock, blunt chest & abdominal trauma
- Smoke inhalation, burns and long bone injury or surgery
- Asthmatics, COPD, myopathies
- Recent respiratory infections
- Other due to anatomy anomalies
  - Down’s Syndrome, obesity, s/p cervical fusion & open airways (tracheostomy)
Applying the Evidence

- Review the literature
- Define the parameters for screening
- Write the protocol
- Embed the screening tool in EMR
Exclusion Criteria

- Those with endotracheal tubes
- Comfort care patients
- Emergency room patients
- Those actively undergoing moderate and deep sedation
- PACU patients
Key Assessments

- Respiratory Rate
- Oxygenation
- Work of Breathing
- Airway and Secretions
- Mentation
- Skin
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respiratory Rate</strong></td>
<td>Respiratory Rate 12-20 per min (0)</td>
<td>Less than 12 or Greater than 20 (2)</td>
<td>Less than 8 or Greater than 26 (10)</td>
</tr>
<tr>
<td><strong>Oxygenation</strong></td>
<td>R/A - 2LPM (0) 3-4 LMP (1) SpO2 Greater than or equal to 90% (0)</td>
<td>5-9LPM (2) SpO2 85-89% (1)</td>
<td>10+LPM (3) Trach/stoma (10) Artificial Airway* (10) NIVT* (16) SpO2 Less than 85% (3)</td>
</tr>
<tr>
<td><strong>Work of Breathing</strong></td>
<td>Full sentences (0) No accessory muscle use (0)</td>
<td>Partial Sentences (1) Upright position (1) Pursed Lips (1) Labored breathing (1) Chest tubes (5)</td>
<td>Single Words (2) Tripod position (2) Accessory muscle use (2)</td>
</tr>
<tr>
<td><strong>Airway and Secretions</strong></td>
<td>Able to manage secretions (0)</td>
<td>Structural abnormalities* (2) Difficulty managing secretions (2)</td>
<td>Para/Quads (4) Unable to manage secretions (4)</td>
</tr>
</tbody>
</table>
## Screening Parameters cont.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Low</th>
<th>Moderate</th>
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<tbody>
<tr>
<td>Mentation</td>
<td>LOC at baseline (0)</td>
<td>Agitation/Restlessness/Anxiety (1)</td>
<td>Lethargic (2)</td>
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<tr>
<td></td>
<td>Appears at ease (0)</td>
<td>Frequent narcotics (every 4 hours or less) (2)</td>
<td>Obtunded (4)</td>
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<td></td>
<td>PCA (3)</td>
<td>Benzodiazepines (every 4 hours or less) (2)</td>
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<td>Post sedation/anesthesia in the last 4hrs (2)</td>
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<td>Epidural (3)</td>
<td></td>
</tr>
<tr>
<td>Skin</td>
<td>At Baseline (0)</td>
<td>Pale (1)</td>
<td>Cool (2)</td>
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<tr>
<td></td>
<td></td>
<td>Diaphoretic (1)</td>
<td>Clammy (2)</td>
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<td></td>
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<td>Cap Refill greater than 3 seconds (1)</td>
<td>Cyanotic (3)</td>
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<tr>
<td></td>
<td></td>
<td>Peripheral mottling (1)</td>
<td>Central mottling (4)</td>
</tr>
<tr>
<td>SCORE</td>
<td>Low Risk = 0 - 3</td>
<td>Moderate Risk = 4 - 25</td>
<td>High Risk = Greater than 25</td>
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Reliability & Validity of Screen

- **Reliability (consistent)**
  - Inter-rater first 25 in neonate, pediatrics, & adults

- **Validity (accurate)**
  - Content by nursing, respiratory, & medical experts
  - Content validity via Root Cause Analysis
    - Evaluated scoring and ability to detect respiratory decompensating
  - Used in over 75,000 observations

- Formal statistical reliability and validity testing of the tool is indicated as the next step
When to Screen

- On admission
- Each shift
- When transferred between units
- Accepted from procedural areas after receiving anesthesia
### Embedded Protocol

#### Adult Systems Assessment
- Vital Signs
- Mental Status
- Pupils Assessment
- Neurological
- Swallow Screen
- Neuromuscular/Extremities Assessment
- Seizure Documentation
- Psychological - Emotional
- Sadpersons Suicide Risk
- Breath Sounds Assessment
- Oxygenation Results
- Incentive Spirometry
- Mechanical Ventilation
- Respiratory

#### Respiratory

<table>
<thead>
<tr>
<th>RRST</th>
<th>Description</th>
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<tbody>
<tr>
<td>Respiratory Rate RRST</td>
<td>12 to 20 per minute</td>
</tr>
<tr>
<td>Oxygenation RRST</td>
<td>Room air to 2L</td>
</tr>
<tr>
<td>Work of Breathing RRST</td>
<td>Able to lie down</td>
</tr>
<tr>
<td>Airway/Secretions RRST</td>
<td>Able to manage</td>
</tr>
<tr>
<td>Mentation RRST</td>
<td>Baseline level of</td>
</tr>
<tr>
<td>Skin RRST</td>
<td>At baseline</td>
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</tbody>
</table>

#### Total Score RRST

- **Respiratory Rate RRST** + **Oxygenation RRST** + **Work of Breathing RRST** + **Airway/Secretions RRST** + **Mentation RRST** + **Skin RRST**

#### Reference Text

Hyperlinked directly to written protocol
Key Points in the Protocol

- **Critical Juncture** - the stage at which the patient transitions to the next risk level
- **Cross monitoring** - a second independent assessment to validate symptomology
- **Review best practice** - interventions to recover or prevent deterioration
Low Risk Interventions
Score: 0 - 3

- Continue to monitor every shift and review early warning signs of increased oxygen demand
- Give pneumovax as appropriate
- Give flu vaccination as appropriate
- Treat underlying disease state per orders
- Educate patient/family of options for assistance (i.e., Condition H)
Critical Juncture: Low to Moderate Risk

- **Critical Juncture:** *Change in device to accommodate O2 demand or oxygen flow of up to 4 LPM from baseline in less than four hours or greater than 6 LPM.*

- Charge nurse and RT notified that patient moved to **Moderate Risk**
- At the discretion of the nurse to have cross-monitor
# Critical Juncture Documentation

<table>
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<td>Total Score RRST</td>
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<td>RRST Values</td>
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<td>Critical Juncture</td>
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<td>Actions</td>
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- Change in Device
- Increased O2 of up 4L in 4 Hrs
- O2 Demand Greater than 6L
- Requires O2 Greater Than 10L
- Other
Moderate Risk Interventions
Score: 4-25

In addition to low risk interventions:

- Titrate oxygen to 88-90% (except those who live below)
- Keep patient in position to maintain optimal lung expansion
- Monitor for fluid volume overload
- Consult RT
- Increase observation and assessment frequency Q4
Critical Juncture: Moderate to High Risk

- **Critical Juncture:** *Change in device* to accommodate O₂ demand or oxygen flow greater than **10 LPM**

- Notify physician/designee of **High Risk** using SBAR
- Notify Charge of high Risk & need for cross monitoring
- Call Rapid Response if:
  - No MD response to RN within 15 minutes
  - Condition worsens
  - Need immediate assistance (code blue for intubation)
- Transfer to higher level of care if patient requires cardiac monitoring/centrally monitored continuous oximetry or specialized nursing care
# Actions Documentation

## Respiratory

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## RRST

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## Actions

- Notify MD using SBAR
- Called for Cross Monitoring
- Called Rapid Response
- Called Code Blue
High Risk Interventions
Score: 26+

In addition to Moderate Risk Interventions:
- Increase surveillance Q2 (room placement)
- Notify charge nurse
- Collaborate with RT
- Move to higher level of care with fluctuation in symptoms
- Provide emotional support and stay with patient until stabilized
- Consider Morphine or Anxiolytic in acute phase
- All high risk patients **REQUIRE** RN/RT presence during transport
- Call Code Blue, if airway or oxygen status compromised
Nine Month Measurement

Q2 2011
- 26 Respiratory Events initiating Code Actions

Q3 2011
- 12 Respiratory Events initiating Code Actions

Q4 2011
- 8 Respiratory Events initiating Code Actions
Clinical Outcome

- **70%** reduction in respiratory events triggering code situations:
  - Rapid Response
  - Code Blue
  - Condition H

- No failure to rescue episodes since implementation
Mini-Root Cause Analysis

- For each code situation (Blue, RRT, Condition H)
- Conduct an incident description
- Determine if compromised respiratory status was a contributing factor to the incident
- Review RRST scores and interventions to verify standard of practice adherence
- Initially coached staff during first year of implementation
- Now when standard not met incident sent to Peer Review
IMPLICATIONS FOR PRACTICE

- Nurses play a significant role in patient rescue
- The RRST is easy to use and sensitive in detecting early respiratory failure
- The EMR serves as a platform for standardizing practice and guiding nurses to early detection & intervention