prospective

retrospective

system

unit

team

individual

cause analysis

lessons-learned

learning boards

metrics

debrief

rapid chain

daily check-in

safety huddle

watch standers

RRT

STEP

cross monitoring

situational awareness

role change

wellness

questioning attitude

anticipatory thinking
Dynamic Safety Model (Rasmussen 1997)
Early Warning Systems

Watch standers
Monitor patient condition – and adapts care provider response

Real-time surveillance using automated GTT
Monitors patient condition – and adapts care provider response

Harm Early Warning System (HEWS)
Monitors provider condition mismatches – and adapts unit /service line response
Rothman Index

Sons Michael and Steven Rothman developed a single measure of a patient’s overall condition – based on 26 inputs - that can be trended to make decline visible to clinicians. This avoids the *shifting baseline effect* where subtle rates of decline are difficult to detect for clinicians who see a patient for only one or two days before being relieved.

(Methodist (Houston), Shands, and Yale-New Haven are among those who use the Rothman Index within their EHR.)
Voluntary Reporting

- GTT
- Claims
- Outside

Filtering

Preventability

Severity

Measuring

Serious Safety Event Rate Per 10,000 Adjusted Patient Days January 2003 – March 2007
Voluntary Reporting

- eMr-GTT-PSO

- Claims

- Outside

Reporting → Filtering → Measuring

Preventability → Severity

SSER: Serious Safety Event Rate Per 10,000 Adjusted Patient Days (January 2003 – March 2007)

HPI®
Harm Early Warning System (HEWS)

A Harm Early Warning System provides *timely and meaningful information* to appropriate individuals when an *increased level of risk is present* due to one or more factors.

An effective Harm Early Warning System *suggests potential mitigating actions or risk reduction strategies* to reduce the probability or consequence of harm.

A Harm Early Warning System includes four key activities:

1. **Monitoring:** Periodic and PRN evaluation of factors that increase risk
2. **Quantification:** Analysis and quantification of factors that increase risk
3. **Dissemination:** Communication of alerts and warnings to appropriate individuals
4. **Mitigation:** Prescribed actions in response to minimize the risk
Comprehensive Four-Level HEWS

Hospital HEWS

Unit HEWS

Team HEWS

Individual HEWS

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# HEWS Factors to Consider

<table>
<thead>
<tr>
<th>Factors</th>
<th>Individual HEWS</th>
<th>Team HEWS</th>
<th>Unit HEWS</th>
</tr>
</thead>
</table>
| **Environmental**| • new or non-routine work location  
• equipment (shortages, new equipment)  
• noise, light, heat, distractions  
• others | • new or non-routine work location  
• equipment (shortages, new equipment)  
• noise, light, heat, distractions  
• others | • equipment (shortages, new equipment)  
• noise, light, heat, distractions  
• others |
| **Task/Activity**| • infrequently performed or high-risk tasks  
• complex tasks  
• others | • infrequently performed or high-risk tasks  
• complex tasks  
• changes in policies and/or procedures  
• others | • infrequently performed or high-risk tasks  
• complex tasks  
• changes in policies, procedures, equipment  
• others |
| **Individual/Personnel** | • workload (heavy or light)  
• ill/sick  
• fatigued  
• others | • new team members  
• task duration (requires turnover of staff or may impact fatigue or attention)  
• aggregate Individual HEWS scores  
• authority gradient  
• others | • new team members  
• new team leader  
• aggregate patient acuity  
• staffing, census, ratios  
• aggregate Individual HEWS scores  
• others |
### Hospital HEWS

1. Demonstration of “Safety as a Core Value” (e.g. executive messaging is absent, etc.)
2. Serious Safety Event Rate trends (increasing or stable)
3. Precursor or Near Miss Safety Events reporting (declining reporting rates)
4. Use of Benchmarking Data (accolades and comparing to floor vs. ceiling)
5. Medical staff ownership of safety culture (low level of tone, tools, commitment)
6. Leadership Method deployment (low reliability in Daily Huddle, RTI, Fair & Just, Top 10 List at all levels, etc.)
7. Morale and/or Employee Engagement Surveys (declining trends)
8. Cause Analysis Program (declining quality & frequency of CCA and RCA)
9. Lessons-Learned Process (declining quality & frequency)
10. “Group Think” (symptoms in evidence)
### Potential Risk Mitigation Strategies

<table>
<thead>
<tr>
<th>Individual HEWS</th>
<th>Team HEWS</th>
</tr>
</thead>
</table>
| • increased focus/attention on specific human error prevention techniques (e.g. STAR, team member checking/coaching, etc.)
  • escalation to leadership for risk mitigation strategies (e.g. increased leadership involvement, delay/cancelling of specific activities, etc.)
  • others |
| • increased focus/attention on specific human error prevention techniques
  • Increased focus/attention on specific leadership methods (e.g. thorough pre-job brief, increased leadership oversight, formalized handoffs, etc.)
  • conduct formalized job/task hazard analysis including risk mitigation assessment
  • in-situ simulation
  • delay/cancelling of specific activities
  • others |
## Potential Risk Mitigation Strategies

<table>
<thead>
<tr>
<th>Unit HEWS</th>
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</thead>
<tbody>
<tr>
<td>• increased focus/attention on specific human error prevention techniques (e.g. STAR, team member checking/coaching, etc.)</td>
<td></td>
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<tr>
<td>• in-situ simulation</td>
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<tr>
<td>• increased focus/attention on specific leadership methods (e.g. thorough pre-job brief, increased leadership oversight, formalized handoffs, etc.)</td>
<td></td>
</tr>
<tr>
<td>• escalation to senior leadership for risk mitigation strategies (e.g. increased staffing, delay/cancelling of specific activities, etc.)</td>
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<tr>
<td>• others</td>
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<th>Hospital HEWS</th>
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<td>• engagement of Board, Senior Leadership and Medical Staff Leadership resulting in a formalized risk mitigation assessment &amp; plan</td>
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<tr>
<td>• others</td>
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</table>
Dynamic Safety Model  (Rasmussen 1997)