Patient Assessment: Why one look is not enough

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Disclosures

• I have no conflicts of interest
Patient Assessment and Monitoring

• Risk Assessment
  – High
  – Medium
  – Low
  • *Is NEWS the best?*

• Trends
  – Up or down
  – Rate of change
  • *Is NEWS the best?*
Assessing Mortality Risk

Stable

• Date of birth
• Past History
• Hospital admission
• Co-morbidity
  – COPD
  – CHF
  – Diabetes
  – Dementia
  – Stroke
  – Renal failure
• Functional status
• Medication

Volatile

• How patient feels
• Vital signs
• Mental status
• Mobility (Frailty)
• ECG status
• Hydration status
• Pain
• Breathlessness
• Skin
• Bleeding
• Vomiting/Diarrhoea
• Medication
• Diagnosis
• Lab data
One picture is 1000 words
One picture is 1000 words

10 out of 10 pain
One picture is 1000 words

Social admission
**Clinical Frailty Scale**

- **Fit**: 80% 5 year survival
- **Well**: 55% 5 year survival
- **Managing well**: 45% 5 year survival
- **Vulnerable**: 40% 5 year survival
- **Mildly frail**: 40% 5 year survival
- **Moderately frail**: 35% 5 year survival
- **Severely frail**: 25% 5 year survival

**Canadian Study of Health and Aging 2**
- 10,000 patients
- >70 years old

**Functional status**
Validation of the VitalPAC™ Early Warning Score (ViEWS) in acutely ill medical patients attending a resource-poor hospital in sub-Saharan Africa

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\textsuperscript{b} Medical Wards, St. Joseph’s Kitovu Health Care Complex, Masaka, Uganda
\textsuperscript{c} Thunder Bay Regional Health Sciences Center, Thunder Bay, Ontario, Canada

<table>
<thead>
<tr>
<th>Activity</th>
<th>Total (n=844)</th>
<th>Alive (n=778)</th>
<th>Dead (n=66)</th>
<th>p</th>
<th>Odds ratio</th>
<th>95% CI</th>
<th>Chi-square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking unaided</td>
<td>506 (60.0%)</td>
<td>495</td>
<td>11 (2.2%)</td>
<td>–</td>
<td>1.0</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Walking with help</td>
<td>198 (23.5%)</td>
<td>179</td>
<td>19 (9.6%)</td>
<td>0.000003</td>
<td>4.78</td>
<td>2.11–10.95</td>
<td>17.44</td>
</tr>
<tr>
<td>Bed ridden</td>
<td>140 (16.6%)</td>
<td>104</td>
<td>36 (25.7%)</td>
<td>&lt;0.00001</td>
<td>15.58</td>
<td>7.35–33.70</td>
<td>86.62</td>
</tr>
</tbody>
</table>

OR 1.0  OR 4.8  OR 15.6
Research paper

A four item scale based on gait for the immediate global assessment of acutely ill medical patients – one look is more than 1000 words

J. Kellett a,*, M. Clifford b, A. Ridley c, A. Murray d, M. Gleeson e

<table>
<thead>
<tr>
<th>SUHB scale</th>
<th>Stable gait</th>
<th>Unstable gait</th>
<th>Help walking</th>
<th>Bedridden</th>
<th>C statistic SUHB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>1726 (58.4%)</td>
<td>712 (24.1%)</td>
<td>466 (15.8%)</td>
<td>50 (1.7%)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>55.0 SD 15.6</td>
<td>75.3 SD 12.7</td>
<td>80.1 SD 11.8</td>
<td>79.3 SD 13.2</td>
<td></td>
</tr>
<tr>
<td>Male sex</td>
<td>52%</td>
<td>52%</td>
<td>56%</td>
<td>54%</td>
<td></td>
</tr>
<tr>
<td>30-day mortality</td>
<td>2 (0.1%)</td>
<td>12 (1.7%)</td>
<td>24 (5.2%)</td>
<td>9 (18.0%)</td>
<td>0.85 SE 0.04</td>
</tr>
<tr>
<td>History of falls a</td>
<td>21 (1.2%)</td>
<td>46 (6.5%)</td>
<td>86 (18.5%)</td>
<td>4 (8.0%)</td>
<td>0.79 SE 0.02</td>
</tr>
<tr>
<td>Pressure sore/ulcer</td>
<td>18 (1.0%)</td>
<td>43 (6.0%)</td>
<td>82 (17.6%)</td>
<td>14 (28.0%)</td>
<td>0.80 SE 0.02</td>
</tr>
<tr>
<td>Altered mental status</td>
<td>5 (0.3%)</td>
<td>2 (0.3%)</td>
<td>7 (1.5%)</td>
<td>9 (18.0%)</td>
<td>0.79 SE 0.06</td>
</tr>
<tr>
<td>Probable dementia</td>
<td>10 (0.6%)</td>
<td>30 (4.2%)</td>
<td>108 (23.2%)</td>
<td>18 (36.0%)</td>
<td>0.86 SE 0.02</td>
</tr>
<tr>
<td>Urinary incontinence</td>
<td>3 (0.2%)</td>
<td>13 (1.8%)</td>
<td>74 (15.9%)</td>
<td>12 (24.0%)</td>
<td>0.88 SE 0.02</td>
</tr>
<tr>
<td>Faecal incontinence</td>
<td>5 (0.3%)</td>
<td>8 (1.1%)</td>
<td>73 (15.7%)</td>
<td>15 (30.0%)</td>
<td>0.88 SE 0.02</td>
</tr>
<tr>
<td>Catheter</td>
<td>9 (0.5%)</td>
<td>11 (1.5%)</td>
<td>45 (9.7%)</td>
<td>12 (24.0%)</td>
<td>0.83 SE 0.03</td>
</tr>
<tr>
<td>Transfer ≥ 2 staff</td>
<td>1 (0.1%)</td>
<td>5 (0.7%)</td>
<td>56 (12.5%)</td>
<td>47 (94.0%)</td>
<td>0.94 SE 0.02</td>
</tr>
</tbody>
</table>

Activities daily living Needs help with

| Stairs                      | 51 (3.0%)   | 173 (24.3%)   | 315 (67.6%)  | 48 (96.0%) | 0.87 SE 0.01     |
| Toilet                      | 12 (0.7%)   | 33 (4.6%)     | 286 (61.4%)  | 47 (94.0%) | 0.93 SE 0.01     |
| Bathing                     | 13 (0.8%)   | 39 (5.5%)     | 428 (91.9%)  | 45 (90.0%) | 0.96 SE 0.01     |
| Feeding                     | 8 (0.5%)    | 34 (4.8%)     | 259 (55.6%)  | 47 (94.0%) | 0.93 SE 0.01     |
| Dressing                    | 12 (0.7%)   | 31 (4.4%)     | 290 (62.2%)  | 46 (92.0%) | 0.94 SE 0.01     |
| Grooming                    | 16 (0.9%)   | 97 (13.6%)    | 305 (65.5%)  | 45 (90.0%) | 0.92 SE 0.01     |
What is your NEWS?
### Escalation Protocol Flow Chart

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Minimum Observation Frequency</th>
<th>ALERT</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12 Hourly</td>
<td>Nurse in charge</td>
<td>Nurse in charge to review if new score 1</td>
</tr>
<tr>
<td>2</td>
<td>6 Hourly</td>
<td>Nurse in charge</td>
<td>Nurse in charge to review</td>
</tr>
<tr>
<td>3</td>
<td>4 Hourly</td>
<td>Nurse in charge &amp; Team/On-call SHO</td>
<td>1. SHO to review within 1 hour</td>
</tr>
</tbody>
</table>
| 4-6         | 1 Hourly                      | Nurse in charge & Team/On-call SHO | 1. SHO to review within 1/2 hour  
2. If no response to treatment within 1 hour contact Registrar  
3. Consider continuous patient monitoring  
4. Consider transfer to higher level of care |
| ≥ 7         | 1/2 Hourly                    | Nurse in charge & Team/On-Call Registrar Inform Team/On-Call Consultant | 1. Registrar to review immediately  
2. Continuous patient monitoring recommended  
3. Plan to transfer to higher level of care  
4. Activate Emergency Response System (ERS) (as appropriate to hospital model) |

**Note: Single Score triggers**

<table>
<thead>
<tr>
<th>Score of 2 HR ≤ 40 (Bradycardia)</th>
<th>1/2 Hourly</th>
<th>Nurse in charge &amp; Team/On-call SHO</th>
<th>1. SHO to review immediately</th>
</tr>
</thead>
</table>
| *Score of 3 in any single parameter | 1/2 Hourly or as indicated by patient’s condition | Nurse in charge & Team/On-call SHO | 1. SHO to review immediately  
2. If no response to treatment or still concerned contact Registrar  
3. Consider activating ERS |
Assumptions

- Sick patients are more likely to get worse
  - therefore need more monitoring
- Well patients are less likely to get worse
  - therefore need less monitoring

If its high lower it
If its low raise it
All vital signs since 2005 recorded in Hospital IT System
No mental status recorded
Therefore could only calculate Abbreviated ViEWS

“AbEWS”

>8 million vital signs
44,531 acutely ill medical patients

- 1.4% for 0-2 AbEWS
- 5.6% for 3-6 AbEWS
- 20.3% for >=7 AbEWS

Murray et al. Resuscitation 2014;85:544-548
Average AbEWS within 24 hours of death
Who do you call?
Who do you call?

Cumulative total of patients

Average AbEWS

Unsalvable?
Who do you call? 

Unsalvageable?
Who do you call?

Unsalvageable?

Cumulative total of patients

Average AbEWS

[Graph showing the cumulative distribution of patients with varying average AbEWS scores, with a question mark at the bottom and a title at the top.]
What is your NEWS?

Good

Bad
Proportion of patients after admission

- Dead
- Increase
- Unchanged
- Decrease
- Discharged

Admission AbEWS: 0-2

Murray et al. Resuscitation 2014;85:544-548
Odds ratio of In-hospital mortality for a decreased AbEWS after admission
AbEWS

Length of stay (days)
Survived: 8.3 SD 6.2
Died: 5.9 SD 6.5

Admission AbEWS >=7
AbEWS

Length of stay (days)
Survived: 7.5 SD 6.0
Died: 8.6 SD 7.3
Length of stay (days)
Survived: 6.4 SD 5.7
Died: 10.6 SD 7.5
• How long to make a prediction?
  – *Risk assessment*
    • Co-morbidity/Frailty/Severity
  – *Monitoring*
    • 24-48 hours
    • What about 3\textsuperscript{rd} day?

• Escalation Protocols
  – Must consider EWS relative change
One size does not fit all!

Low risk are High risk!
Editorial

Not getting better means getting worse – Trends in Early Warning Scores suggest that there might only be a short time span to rescue those threatening to fall off a “physiological” cliff?

Subbe, Thorpe and Hancock

Happy 0-2 land
Happy 0-2 land
Patient Assessment and Monitoring

- **Risk**
  - High
  - Medium
  - Low

- **Trends**
  - Up or down
  - Rate of change

*How to respond?*
A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population

Alex B. Haynes, M.D., M.P.H., Thomas G. Weiser, M.D., M.P.H.,
William R. Berry, M.D., M.P.H., Stuart R. Lipsitz, Sc.D.,
Abdel-Hadi S. Breizat, M.D., Ph.D., E. Patchen Dellinger, M.D.,
Teodoro Herbosa, M.D., Sudhir Joseph, M.S., Pascience L. Kibatala, M.D.,
Marie Carmela M. Lapitan, M.D., Alan F. Merry, M.B., Ch.B., F.A.N.Z.C.A., F.R.C.A.,
Krishna Moorthy, M.D., F.R.C.S., Richard K. Reznick, M.D., M.Ed., Bryce Taylor, M.D.,
and Atul A. Gawande, M.D., M.P.H., for the Safe Surgery Saves Lives Study Group*

RESULTS

The rate of death was 1.5% before the checklist was introduced and declined to 0.8% afterward (P=0.003). Inpatient complications occurred in 11.0% of patients at baseline and in 7.0% after introduction of the checklist (P<0.001).


Crisis Collaborative Checklists

Twitter account is @CrisisChecklist
Thanks to...

• Alan Murray - Cork
• Simon Woodworth - Cork
• Wendy Huang – Thunder Bay
• Mary Clifford - Nenagh
• Annette Ridley - Nenagh
• Margaret Gleeson - Nenagh
Thank you