# INTRODUCING A NURSE-EMPOWERED EARLY WARNING SCORE

Witte TAGM de,[a] Berkom P van,[a] Paulussen I,[b] Noordergraaf GJ,[b] Nat G van der.[a]

## BACKGROUND & PURPOSE

In-hospital patients are often at risk for acute deterioration, which can lead to many adverse outcomes including death. It is a challenge to identify these patients in time and to provide proper care to prevent these outcomes. For this goal, many hospitals employ an **Early Warning Score** (EWS).

We aimed to introduce an integrated EWS to our 1100 bed hospital to improve the identification of patients at risk for acute deterioration, and to find a way to empower our nurses in providing optimal care for these patients.

## METHODS & PROCESS

- Development of new EWS using available literature: the **EWS-MB**.

- Phase 1: Nurses on two surgical and two medical wards scored their patients, also reporting on their clinical perception of the patient and their idea of appropriate clinical actions.

- Assessment of clinical outcome of the patients scored.

- Phase 2: Development of **treatment guidelines** based on the outcome of phase 1.

- Gathering of new measurements and feedback.

Interventions were defined as: call for rapid response team, the need for resuscitation, admission to the ICU, immediate (revision) surgery, or death.

**EWS-MB (Early Warning Score - Midden Brabant)**

| | | 3 | 2 | 1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|---|
| A | **respiratory rate** | ≤ 6 or obstructive | 7 - 9 | | 10 - 14 | 15 - 20 | 21 - 29 | ≥ 30 |
| B | **$SpO_2$** | ≤ 90 | 91 - 93 | | ≥ 94 | | | |
| B | **$O_2$ supplements** | | | | none | nasal | NRM | |
| C | **heart rate** | ≤ 40 | 41 - 50 | 51 - 60 | 61 - 100 | 101 - 110 | 111 - 129 | ≥ 130 |
| C | **systolic BP** | ≤ 70 | 71 - 80 | 81 - 100 | 101 - 180 | 181 - 200 | 201 - 219 | ≥ 220 |
| D | **consciousness** | | | | A | V | P | U |
| D | **acute confusion** | | | yes | no | | | |
| E | **temperature** | | ≤ 35 | 35.1 - 36 | 36.1 - 38.3 | 38.4 - 39.5 | ≥ 39.5 | |
| N | **nurse** | doubt / gut feeling | | | unconcerned | | | |

| EWS | repeat | Treatment Guidelines |
|---|---|---|
| 0 - 1 | ≤ 24 h | Continue vitals once per 24 hours. Goal: Early recognition of deterioration. |
| 2 - 3 | ≤ 12 h | Intention is to discover a trend that is / is not corresponding with reason of admission. Documentation of score aimed at ABCDE and abnormal vital signs. |
| 4 | ≤ 8 h | - Check vitals every shift (including nights) to discover trend.<br>- Mandatory consulting of resident physician / physician assistant during shift and evaluation of treatment. Consult resident physician / PA in case new concerns arise.<br>- Set goals for next 24 hours and monitor progress. Realize interventions don't need to have immediate effect (i.e.: antibiotics) but be suspicious. |
| 5 - 6 | ≤ 4 h | - Mandatory consultation of attending physician during shift. Consult resident physician / PA immediately if new concerns arise.<br>- Start therapy / additional diagnostics and evaluate within 4 hours.<br>- Set goals for next 24 hours and monitor progress. Assess whether level of care is appropriate.<br>- PM: Contact QRT (88888) for support if EWS score does not decrease. |
| 7+ | ≤ 2 h | - **Immediate consultation of RRT (88888).** Exceptions only by specific order.<br>- Mandatory consultation of attending physician.<br>- Start therapy and assess whether transfer to MCU / ICU is indicated.<br>- Evaluation of treatment within 2 hours. Immediate communication of new concerns. |

## RESULTS

In total 897 measurements were taken of 365 patients. In 93.4% of all cases nurses agreed with the recommended treatment guidelines for their patient.

**Identification and prediction: EWS-MB vs nurses' assessment**

| | Nurse | EWS-MB ≥ 4 |
|---|---|---|
| Identification of patients who had intervention | 85,7% | 100% |
| Correct prediction of intervention (y / n) in patients scoring ≥ 4 on EWS-MB | 83,9% | 53,7% |

## CONCLUSIONS

A score of ≥ 4 on the EWS-MB is useful in **identifying** patients who are at risk for deterioration and who might be missed or diagnosed too late based on nurses' assessment alone.

However, nurses' **clinical assessment** of patients that score ≥ 4 on the EWS-MB is more accurate in predicting the actual need for intervention than just using a score of ≥ 4.

A **combination** of routinely scoring the EWS-MB and empowering nurses to take appropriate action for patients identified as being at risk, with the help of treatment guidelines, can therefore be an efficient strategy to provide optimal treatment.

Since our treatment guidelines were developed with nurses' feedback and have a high rate of approval, we are convinced these will help in **empowering nurses** to provide proper care for our patients.

## TAKE HOME MESSAGE

A combination of an EWS and empowering nurses to take appropriate action based on their clinical perception of patients can be a good method of identifying and taking care of patients at risk for acute deterioration.

[a] *Dept of Intensive Care, Elisabeth-Tweesteden Hospital. Hilvarenbeekseweg 60, 5022 Gc Tilburg (NL) t.dewitte@etz.nl)*
[b] *Dept of Anesthesiology, Resuscitation and Pain Management. Elisabeth-Tweesteden Hospital*

ERC conference, Bologna I, 20-22 sept. 2018, AP238