Patient Monitoring - Early Warning Scoring System (MEWS and NEWS2 systems)

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Introduction

Early warning scoring system (EWS) is a guide used by medical services to quickly determine the degree of illness of a patient.

It is derived by using patients physiologic parameters.

Scores where developed in the late 1990's where studies showed that in-hospital deterioration and cardiac arrest where often proceeded by a period of increasing abnormalities in the vital signs.

Overview

Modified Early Warning Score (MEWS)

- MEWS determines the degree of illness of a patient using 4 physiological parameters

National Early Warning Score (NEWS)2

- NEWS2 is the latest version of the National Warning Score (NEWS), first produced in 2012 and developed by the Royal College of Physicians which improves the detection and response to clinical deterioration in adult patients and is a key element of patient safety and improving patient outcomes.

Presentation Sources: NICE Guidelines, Royal College of Physicians

How it works

The MEWS/NEWS2 is based on a simple aggregate scoring system in which a score is allocated to physiological measurements, already recorded in routine practice, when are patients present to, or are being monitored in hospital.

Six simple physiological parameters form the basis of the scoring system:

- Respiration rate
- Pulse Rate
- Oxygen Saturation
- Temperature
- Level of consciousness or new-onset confusion (ACVPU)
- Systolic Blood Pressure

Physiological Parameter	3	2	1	0	1	2	3
Reparation rate (per minute)	≤8		9-11	12-20		21-24	≥25
SpO2 Scale 1 (1%)	≤91	92-93	94-95	≥96			
SpO2 Scale 2 (%)	≤83	84-85	86-87	88-92 ≥93 on air	93-94 on oxygen	95-96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91-100	101-110	111-219			≥220
Pulse (per minute)	≤40		41-50	51-90	91-110	111-130	≥131
Consciousness				Alert			CVPU
Temperature	≤35		35.1-36.0	36.1-38.0	38.1-39.0	≥39.1	

The Benefits of NEWS2

- Provide a single standardised early warning system across the UK for early detection of acutely unwell patient.
- Provide a standardised score to determine illness severity to support consistent clinical decision making and an appropriate clinical response
- Provides a vehicle for the adoption of a standardised scoring system throughout the acute hospital, not solely in the context of acute clinical deterioration, but also for continuous monitoring of all patients (Track and Trigger)
- Ensures a standardised means of identifying and responding to patients with unanticipated acute deterioration in their clinical condition whilst in hospital

Exemptions

- NEWS2 is designed for adults aged 16 and over and is not recommended for use in children or during pregnancy.

- Baseline physiologic parameters differ in children and in pregnancy where the magnitude and character of the physiological response to acute illness also differ

- NEWS2 may be unreliable in patient will spinal cord injury, owing to functional disturbances of the autonomic nervous system.

The Process

During clinical assessment, six NEWS2 physiological parameters are recorded. Each allocated a score reflecting the magnitude of disturbance to each of the parameters.

Step 1 - Measure

Step 2 – Record

Step 3 – Calculate

Clinical Response

A score of 0, 1, 2 or 3 is allocated to each parameter. A higher score means the parameter is further from the normal range. Appropriate clinical responses are given for threshold (trigger) levels, with a recommendation to review and agree these locally:

- **Low risk** (aggregate score 1 to 4)
- **Low to medium risk** (score of 3 in any single parameter)
- **Medium risk** (aggregate score 5 to 6)
- **High risk** (aggregate score of 7 or over)

Corresponding Clinical Response

0	Minimum 12 hourly	• Continue routine NEWS2 monitoring
Total 1-4	Minimum 4–6 hourly	• Inform registered nurse, who must assess the patient • Registered nurse decides whether increased frequency of monitoring and/or escalation of care is required
3 in single parameter	Minimum 1 hourly	• Registered nurse to inform medical team caring for the patient, who will review and decide whether escalation of care is necessary
Total 5 or more Urgent response threshold	Minimum 1 hourly	• Registered nurse to immediately inform the medical team caring for the patient. • Registered nurse to request urgent assessment by a clinician or team with core competencies in the care of acutely ill patients. • Provide clinical care in an environment with monitoring facilities.

Score Cards

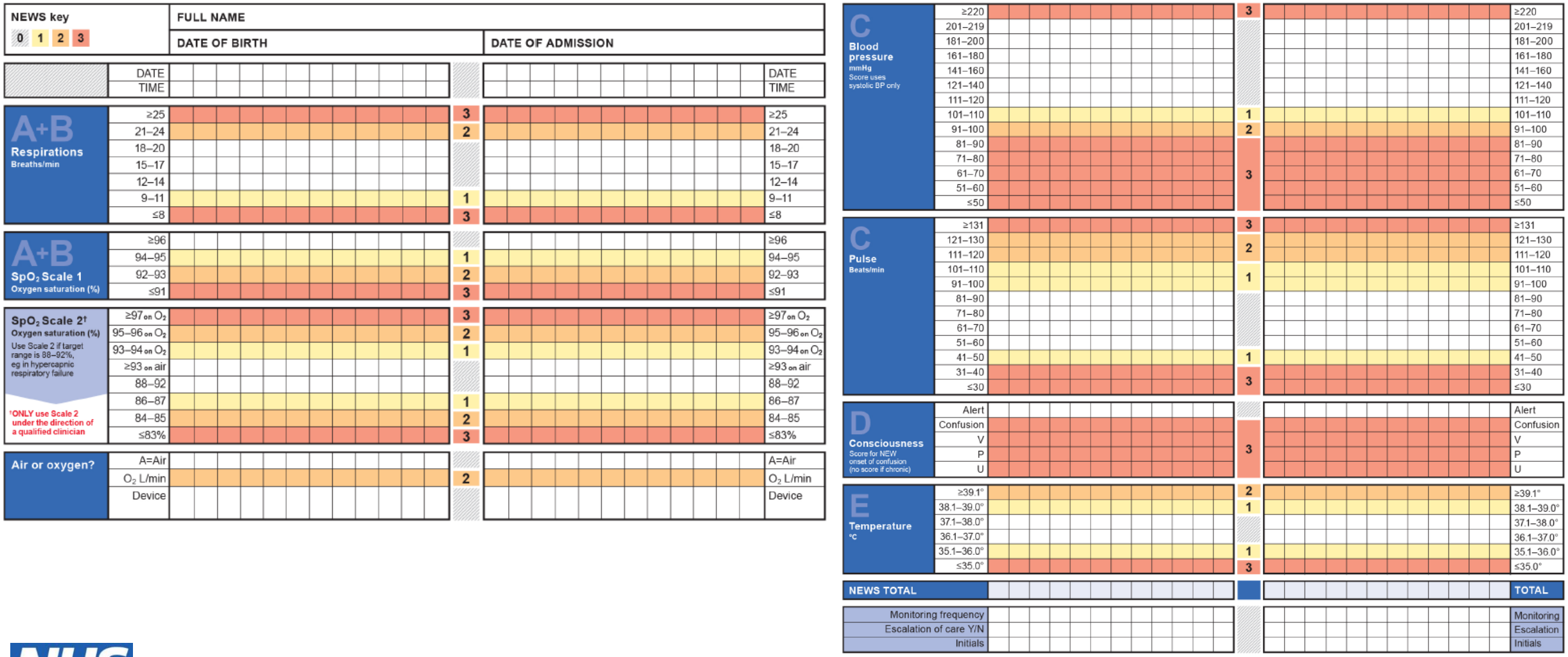
MEWS

Physiological Parameter	3	2	1	0	1	2	3
Heart Rate (HR)		≤40	41-50	51-100	101-110	111-129	≥130
Systolic blood pressure (mmHg)	≤70	71-80	81-100	101-199		≥200	
Reparation rate (per minute)		<9		9-14	15-20	21-29	≥30
Temperature		<35		35-3.8.4		≥38.5	
Consciousness				A	V	P	U

NEWS2

Physiological Parameter	3	2	1	0	1	2	3
Reparation rate (per minute)	≤8		9-11	12-20		21-24	≥25
SpO2 Scale 1 (1%)	≤91	92-93	94-95	≥96			
SpO2 Scale 2 (%)	≤83	84-85	86-87	88-92 ≥93 on air	93-94 on oxygen	95-96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91-100	101-110	111-219			≥220
Pulse (per minute)	≤40		41-50	51-90	91-110	111-130	≥131
Consciousness				Alert			CVPU
Temperature	≤35		35.1-36.0	36.1-38.0	38.1-39.0	≥39.1	

NEWS2 Observation Chart



NEWS key 0 1 2 3	FULL NAME		DATE OF ADMISSION	
		DATE OF BIRTH		
	DATE			DATE
	TIME			TIME
A+B Respirations Breaths/min	≥25	3		≥25
	21–24	2		21–24
	18–20			18–20
	15–17			15–17
	12–14			12–14
	9–11	1		9–11
	≤8	3		≤8
A+B SpO_2 Scale 1 Oxygen saturation (%)	≥96			≥96
	94–95	1		94–95
	92–93	2		92–93
	≤91	3		≤91
SpO_2 Scale 2† Oxygen saturation (%) Use Scale 2 if target range is 88–92%, eg in hypercapnic respiratory failure †ONLY use Scale 2 under the direction of a qualified clinician	≥97 on O_2	3		≥97 on O_2
	95–96 on O_2	2		95–96 on O_2
	93–94 on O_2	1		93–94 on O_2
	≥93 on air			≥93 on air
	88–92			88–92
	86–87	1		86–87
	84–85	2		84–85
	≤83%	3		≤83%
Air or oxygen?	A=Air			A=Air
	O_2 L/min	2		O_2 L/min
	Device			Device
C Blood pressure mmHg Score uses systolic BP only	≥220	3		≥220
	201–219			201–219
	181–200			181–200
	161–180			161–180
	141–160			141–160
	121–140			121–140
	111–120			111–120
	101–110	1		101–110
	91–100	2		91–100
	81–90	3		81–90
	71–80			71–80
	61–70			61–70
	51–60			51–60
	≤50			≤50
C Pulse Beats/min	≥131	3		≥131
	121–130	2		121–130
	111–120			111–120
	101–110	1		101–110
	91–100			91–100
	81–90			81–90
	71–80			71–80
	61–70			61–70
	51–60			51–60
	41–50	1		41–50
	31–40	3		31–40
	≤30			≤30
D Consciousness Score for NEW onset of confusion (no score if chronic)	Alert			Alert
	Confusion	3		Confusion
	V			V
	P			P
	U			U
E Temperature °C	≥39.1°	2		≥39.1°
	38.1–39.0°	1		38.1–39.0°
	37.1–38.0°			37.1–38.0°
	36.1–37.0°			36.1–37.0°
	35.1–36.0°	1		35.1–36.0°
	≤35.0°	3		≤35.0°
NEWS TOTAL				TOTAL
Monitoring frequency				Monitoring
Escalation of care Y/N				Escalation
Initials				Initials

Current Guidance

Total NEWS2 score of 5 or more

Score of 3 in a single parameter

Think Sepsis!

Case Study

- A 55 year old lady who has been admitted to the medical ward with possible community acquired pneumonia.

Observation reported		Score
Reparatory rate	26	3
Oxygen saturation	95%	1
Supplemental Oxygen	No	0
Systolic blood pressure	111	0
Pulse	104	1
Consciousness	A	0
Temperature	38.C	0
	Calculate	**5**

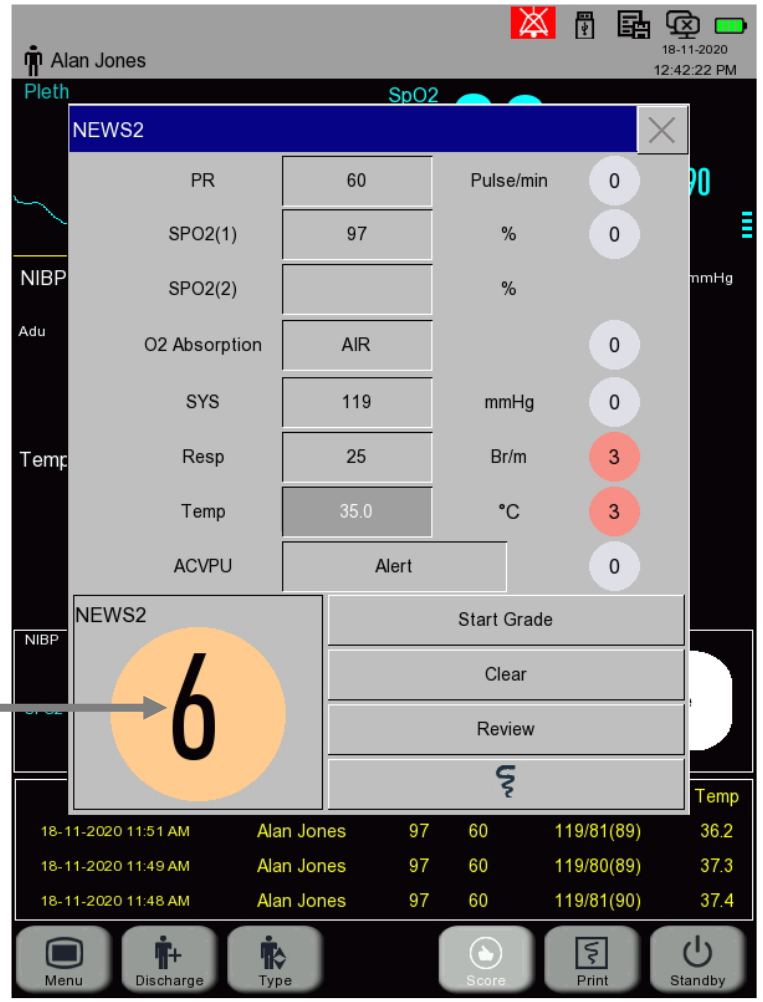
Individual score of 3 or a total score of 5 or more should consider Sepsis

Vital Signs Monitors

(MEWS & NEWS 2 Built-in)

- MEWS / NEWS2 scoring systems are built into some Vital Signs Monitors
- MEWS / NEWS scoring system is built into the Huntleigh Smartsigns SC500 Vital Signs Monitor, as standard.
- Input variables are calculate automatically
- Aggregated score generated

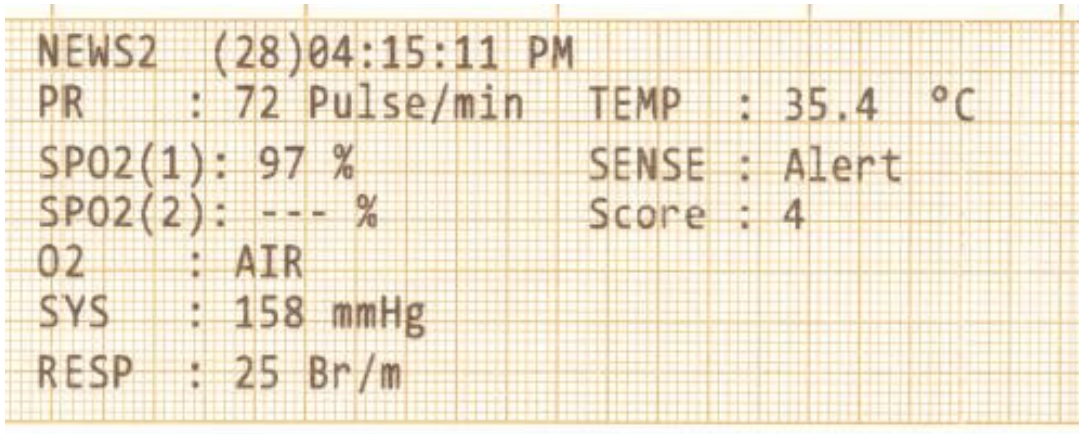
Aggregated NEWS2 Score

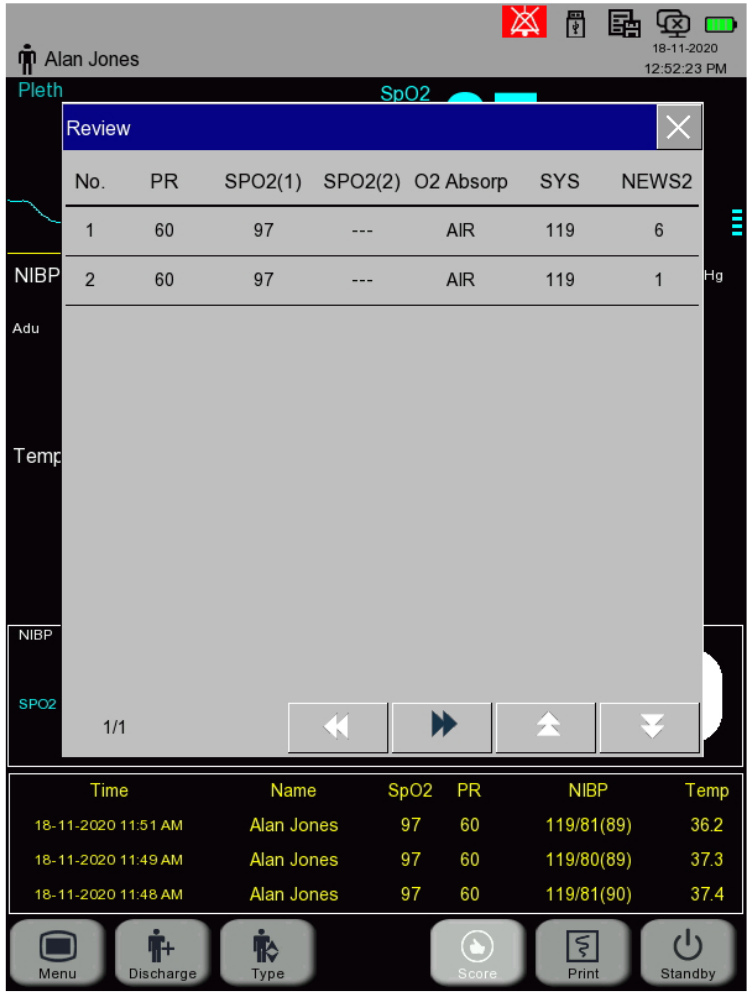


Vital Signs Monitors

(MEWS & NEWS 2 Built-in)

- Review of calculated scores can be displayed.
- Scores can be printed and added to patient notes





Summary

- MEWS/NEWS2 Improves the detection and response to clinical deterioration in adult patients and is a key element of patient safety and improving patient outcomes.
- Standardisation across the NHS
- Only applies to ages 16 +
- A single score of 3 or aggregate score of 5, consider sepsis
- The SC500 provides a basic automatic scoring system

Thank You