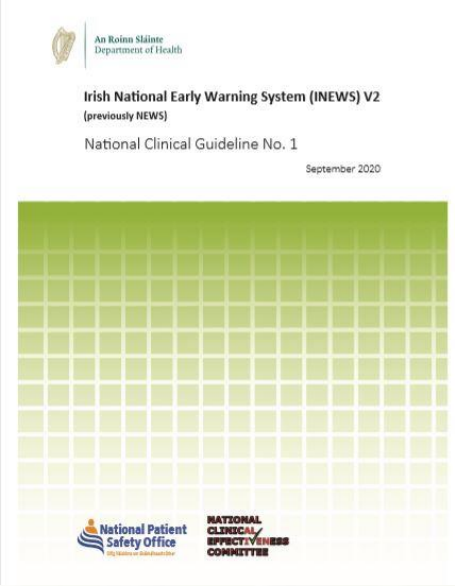
Deteriorating Patient Improvement Programme

Clinical Design & Innovation
Person-centred, co-ordinated care

NCEC National Clinical Guideline No. 1. INEWS V2 (September 2020) – Changes and updates



Facilitators Slide-deck

Developed by Ronan O'Cathasaigh,
Project Lead Education, DPIP

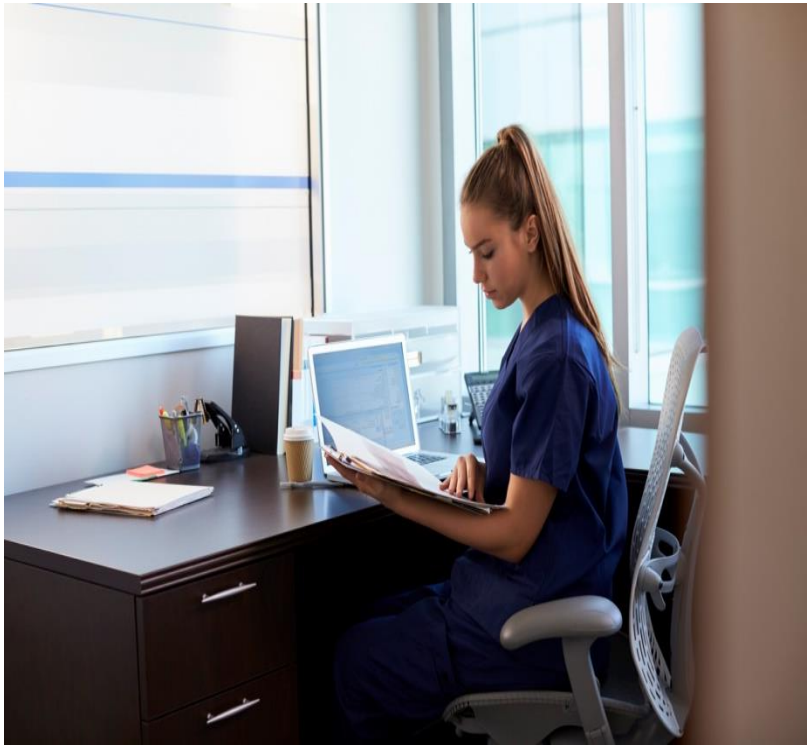
Table of Contents

Irish Early Warning Systems

Deteriorating Patient Improvement Programme

Participant Learning Outcomes

- Recognise that INEWS is an adjunct to clinical judgement
- Anticipate the potential for deterioration
- Recognise and escalate care for a deteriorating patient
- Recognise role of ISBAR in effective communication
- Become familiar with using the new INEWS observation chart
- Understand when the escalation and response protocol can be modified



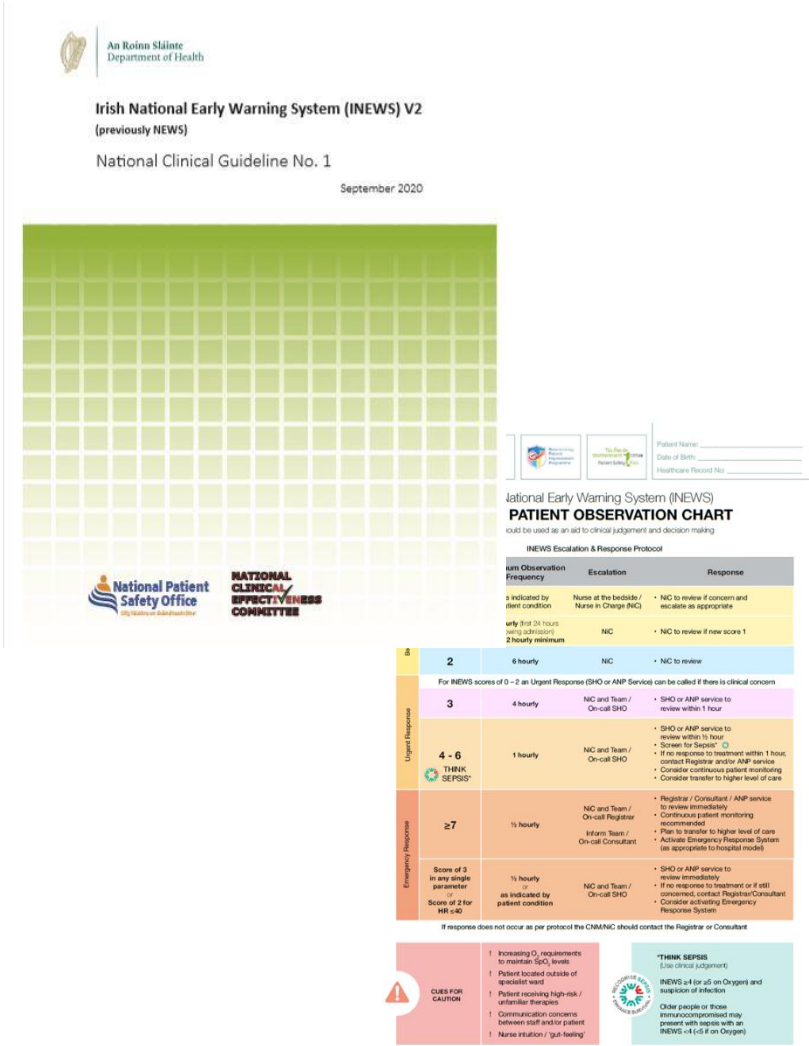
Deteriorating Patient Improvement Programme

What is INEWS?

INEWS is an early warning system to assist staff to recognise and respond to clinical deterioration.

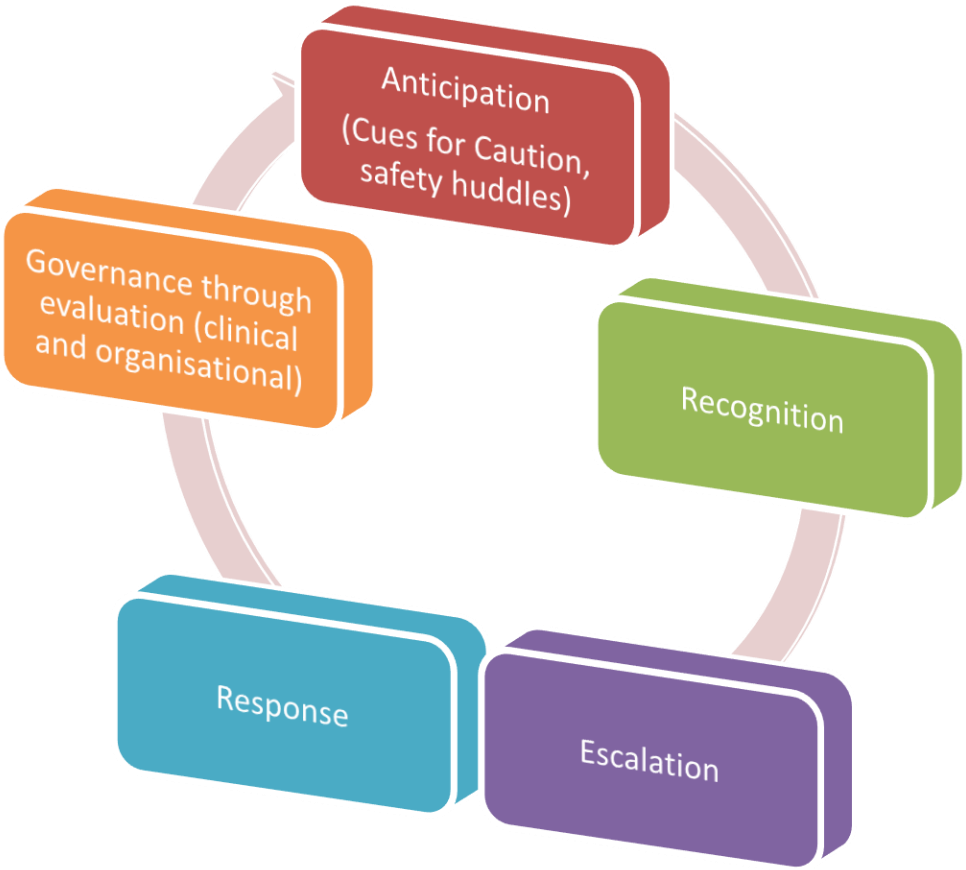
Early recognition of deterioration can prevent:

- Unanticipated cardiac arrest
- Unplanned ICU admission/readmission
- Delayed care resulting in prolonged length of stay, patient or family distress, or more complex interventions
- Requirement for more complex interventions



Deteriorating Patient Improvement Programme

The aim of this presentation is to provide an overview of the changes and updates in INEWS V2



Deteriorating Patient Improvement Programme

- INEWS education is mandatory for all relevant HCPs

- HCPs should be familiar with their hospitals INEWS Escalation and Response Protocol

- INEWS education is included in most clinical undergraduate programmes

Deteriorating Patient Improvement Programme

What's new in INEWS V2?

- NEWS to INEWS
- System versus Score
- Emphasis on clinical judgement
- Recognition of healthcare worker, patient and family concern as a key indicator of deterioration
- Increased emphasis on changes in respiratory rate as a key early indicator of deterioration

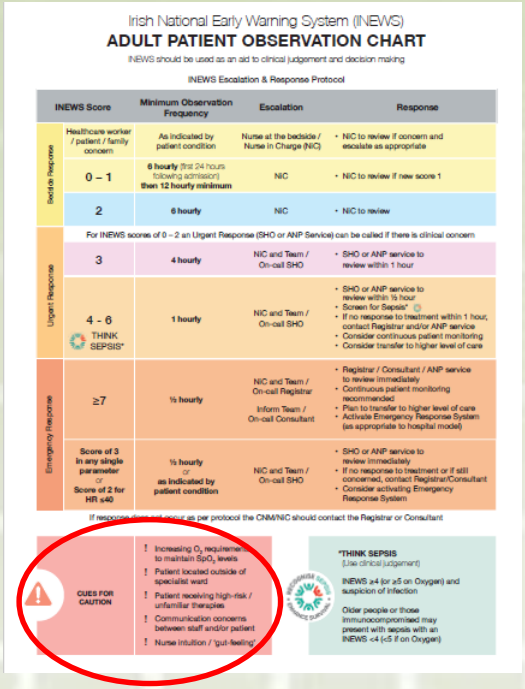
Deteriorating Patient Improvement Programme

What's new in INEWS V2?

'Cues for Caution'
as prompts for staff to consider when monitoring patients

CUES FOR CAUTION

- ! Increasing O_2 requirements to maintain SpO_2 levels
- ! Patient located outside of specialist ward
- ! Patient receiving high-risk / unfamiliar therapies
- ! Communication concerns between staff and/or patient
- ! Nurse intuition / 'gut-feeling'



Irish National Early Warning System (INEWS)

ADULT PATIENT OBSERVATION CHART

INEWS should be used as an aid to clinical judgement and decision making

INEWS Escalation & Response Protocol

	INEWS Score	Minimum Observation Frequency	Escalation	Response
Bedside Response	Healthcare worker / patient / family concern	As indicated by patient condition	Nurse at the bedside / Nurse in Charge (NIC)	• NIC to review if concern and escalate as appropriate
	0 – 1	**6 hourly** (first 24 hours following admission) **then 12 hourly minimum**	NIC	• NIC to review if new score 1
	2	**6 hourly**	NIC	• NIC to review
	For INEWS scores of 0 – 2 an Urgent Response (SHO or ANP Service) can be called if there is clinical concern			
Urgent Response	3	**4 hourly**	NIC and Team / On-call SHO	• SHO or ANP service to review within 1 hour
	4 - 6 THINK SEPSIS*	**1 hourly**	NIC and Team / On-call SHO	• SHO or ANP service to review within ½ hour • Screen for Sepsis* • If no response to treatment within 1 hour, contact Registrar and/or ANP service • Consider continuous patient monitoring • Consider transfer to higher level of care
Emergency Response	≥7	**½ hourly**	NIC and Team / On-call Registrar Inform Team / On-call Consultant	• Registrar / Consultant / ANP service to review immediately • Continuous patient monitoring recommended • Plan to transfer to higher level of care • Activate Emergency Response System (as appropriate to hospital model)
	Score of 3 in any single parameter or **Score of 2 for HR ≤40**	**½ hourly** or **as indicated by patient condition**	NIC and Team / On-call SHO	• SHO or ANP service to review immediately • If no response to treatment or if still concerned, contact Registrar/Consultant • Consider activating Emergency Response System

If response does not occur as per protocol the CNM/NIC should contact the Registrar or Consultant

CUES FOR CAUTION

! Increasing O_2 requirements to maintain SpO_2 levels
! Patient located outside of specialist ward
! Patient receiving high-risk / unfamiliar therapies
! Communication concerns between staff and/or patient
! Nurse intuition / 'gut-feeling'

*THINK SEPSIS (Use clinical judgement)

INEWS ≥4 (or ≥5 on Oxygen) and suspicion of infection

Older people or those immunocompromised may present with sepsis with an INEWS <4 (<5 if on Oxygen)

Deteriorating Patient Improvement Programme

What's new in INEWS V2?

- 'New confusion' a key early sign of deterioration…AVPU becomes A**C**VPU where '**C**' = 'new confusion/altered mental status/delirium'
- Minimum 6 hourly observations x 24 hours following admission
- Adjustments of INEWS parameters or score not permitted
- Modified Escalation and Response Protocol (Consultant or Registrar)
- Option for a short period of escalation deferral by an RGN

Deteriorating Patient Improvement Programme

What's new in INEWS V2?

- 3-tiered response model
- Consultant champions with protected time
- Closed loop governance
- Safety huddles
- Move towards digital INEWS
- Revised INEWS patient observation chart

The Significance of INEWS as a System explained

Anticipate

The use of clinical judgement combined with situation awareness using ‘cues for caution’, staff, patient and/or family concern and safety huddles to anticipate and manage the potential for deterioration in hospitalised patients.

Deteriorating Patient Improvement Programme

Recognise

- Clinical judgment plus…
- Patient assessment
- Supported by the bedside track-and-trigger tool i.e. the **INEWS patient observation chart**

Escalate and Respond

- INEWS Escalation and Response Protocol to guide decisions on escalation for nursing or medical review
- Provision of a structured mechanism for a tiered clinical response - bedside, urgent or emergency response
- A move towards an ANP-response service

Deteriorating Patient Improvement Programme

Evaluate

INEWS V2 supports a closed loop governance system involving:

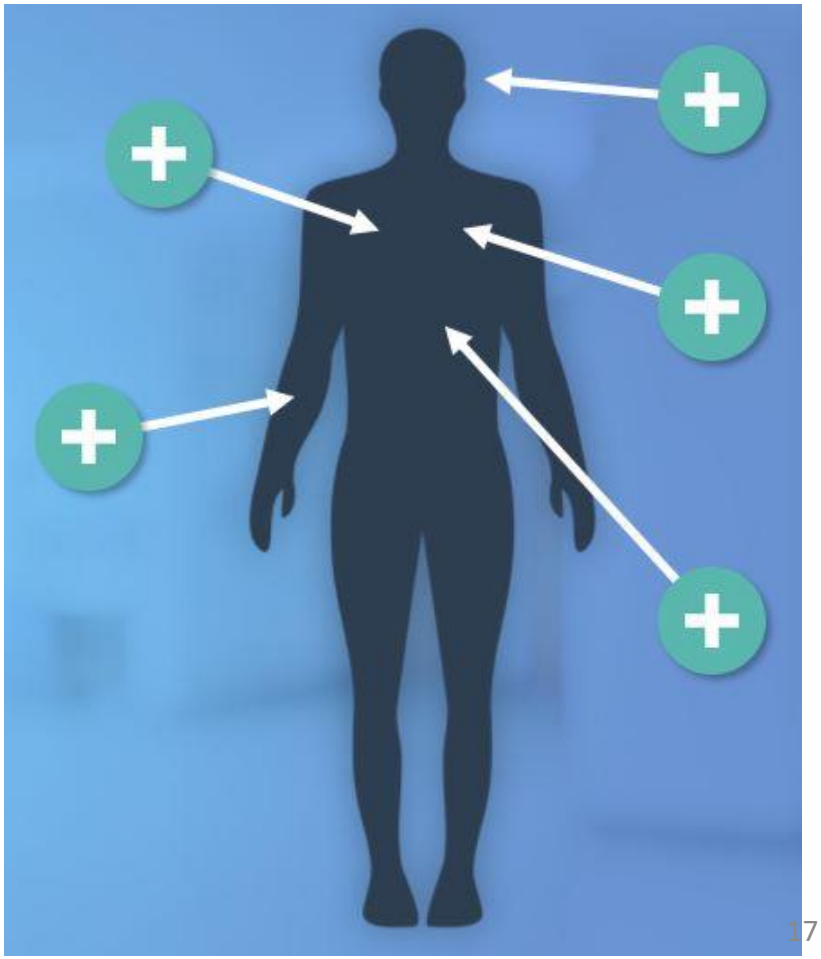
- Bedside clinical evaluation of the effectiveness of treatment interventions
- System-wide evaluation of the management of patient deterioration e.g after-action review, cycles of audit and improvement

Deteriorating Patient Improvement Programme

Quick review of physiological changes during deterioration

A systems approach to patient assessment helps ensure that you don't miss any of the subtle changes associated with deterioration

INEWS V2 emphasises changes in respiratory rate and new confusion/altered mental status/delirium as key early signs of deterioration



Deteriorating Patient Improvement Programme

Respiratory Rate (RR)

- Most neglected vital sign
- Often *estimated* by clinicians rather than counted
- Any change may be an early sign of deterioration
- Changes can be seen up to 24 hrs prior to cardiac arrest
- During early stages of deterioration SpO_2 may remain within normal range while RR may change

RR may be affected by

- Some medications (e.g. opiates)
- Altered level of consciousness

Deteriorating Patient Improvement Programme

Respiratory Rate monitoring

Two main determinants of blood oxygen (O_2) concentration are **ventilation** and **perfusion**

- Ventilation is the air that reaches the alveoli
- Perfusion is the blood that reaches the alveoli via the capillaries
- Respiratory rate measures ventilation
- Pulse oximetry measures oxygen saturation (SpO_2)

Deteriorating Patient Improvement Programme

Cardiovascular system

- Changes in heart rate (HR) can affect cardiac output
- High HR and low BP may reflect inadequate O_2 delivery to the tissues
- ↓BP can reflect a decrease in cardiac output
- Other signs include dizziness, syncope, nausea, chest pain and diaphoresis

Deteriorating Patient Improvement Programme

Neurological System

Early indicators of deterioration include:

- New confusion
- Altered mental status (Subtle or obvious)
- Delirium

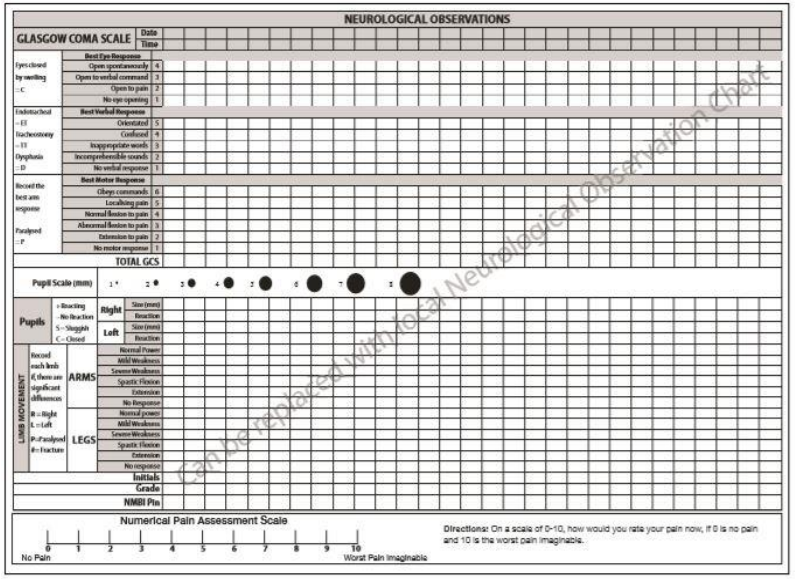
What's the patient's baseline status?

- Consult the patient's family or friends

Consider causes including:

- New environment
- Hypoxia
- Hypo/hyperglycaemia

If altered mental status or level of consciousness is noted, measure Glasgow Coma Scale and check blood glucose



Deteriorating Patient Improvement Programme

Thermoregulation System

- Both pyrexia and hypothermia are significant
- Immunocompromised and older persons may not produce a fever
- Patients with sepsis can present with any temperature
- Caution if anti-pyretic medication is given as it can mask signs of infection

RECOGNISE SEPSIS • ENHANCE SURVIVAL •

Deteriorating Patient Improvement Programme

Renal System

- Decreasing urine output (<0.5mL/kg/hr) is a sign of deterioration
- Monitor renal profile blood results

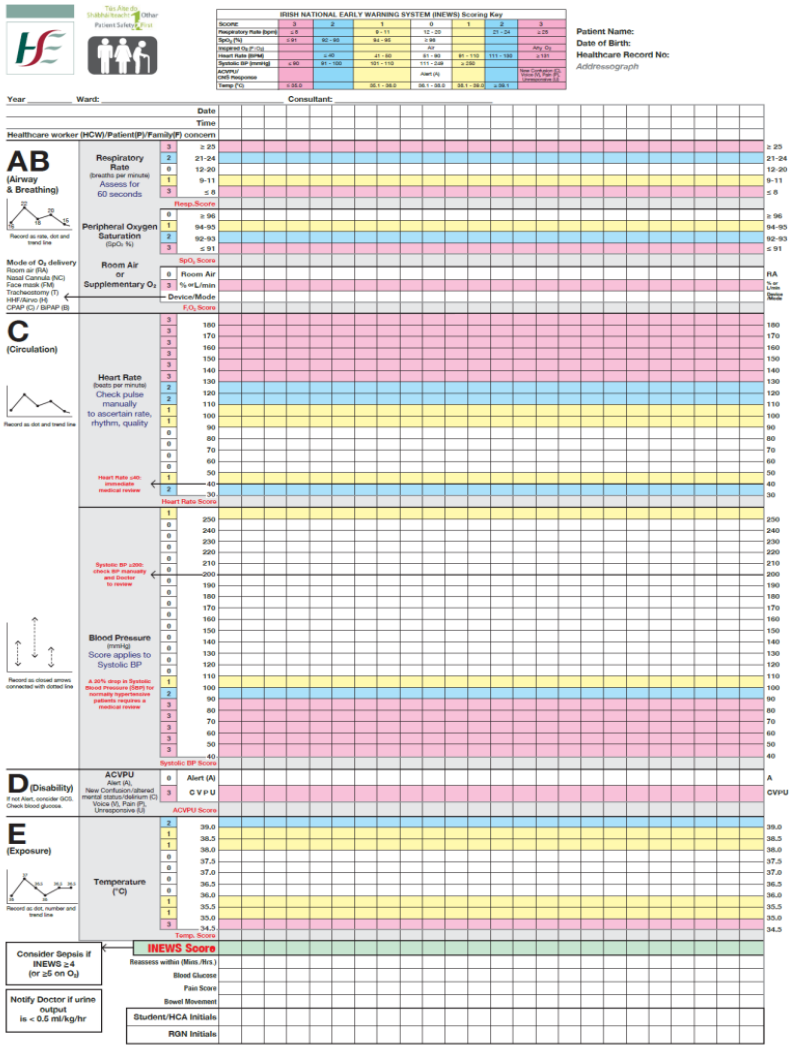
Knowledge check

Which of these observations are the best predictors of deterioration?

a. Altered mental state, such as new confusion or delirium
b. Increase or decrease in temperature
c. Altered respiratory rate
d. Change in urine output

Using the INEWS Patient Observation Chart

- How to document INEWS observations
- How to calculate a patient's INEWS score
- INEWS Escalation & Response Protocol

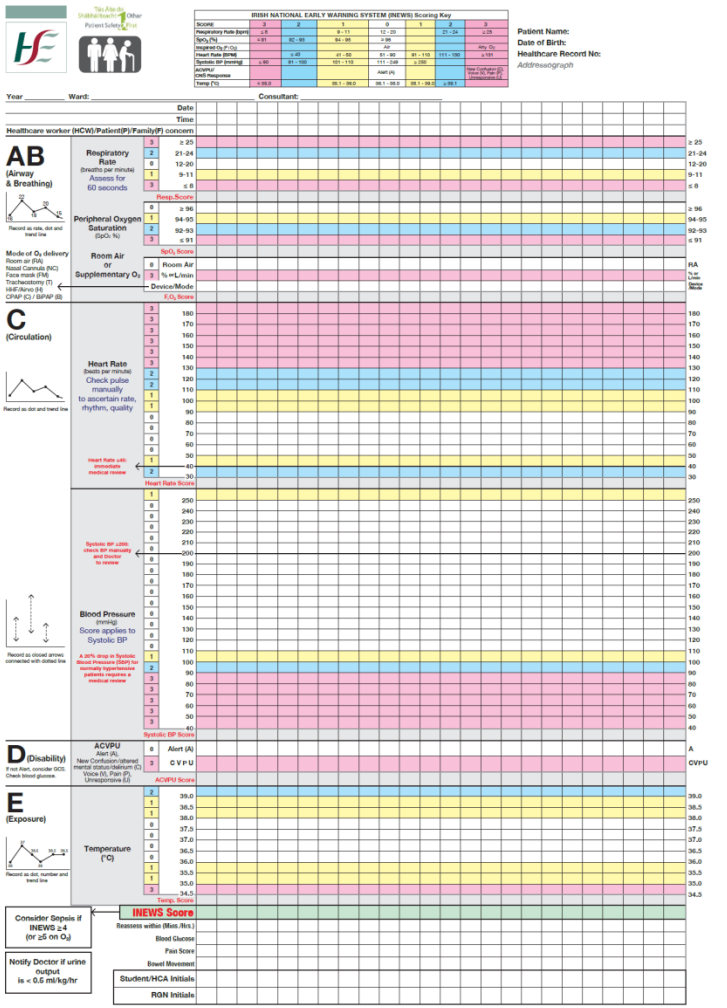


Deteriorating Patient Improvement Programme

Observe Coronavirus precautions at all times

The INEWS Physiological Observations are:

- Respiratory rate
- SpO_2
- FiO_2 (Room air or supplemental O_2)
- Heart rate
- Blood pressure
- Neurological response (or ACVPU, where C = new confusion)
- Temperature



Deteriorating Patient Improvement Programme

The INEWS Scoring Key

Irish National Early Warning System (INEWS) Scoring Key							
SCORE	**3**	**2**	**1**	**0**	**1**	**2**	**3**
Respiratory Rate (bpm)	≤ 8		9 - 11	12 - 20		21 - 24	≥ 25
SpO_2 (%)	≤ 91	92 - 93	94 - 95	≥ 96			
Inspired O_2 (Fi O_2)				Air			Any O_2
Heart Rate (BPM)		≤ 40	41 - 50	51 - 90	91 - 110	111 - 130	≥ 131
Systolic BP (mmHg)	≤ 90	91 - 100	101 - 110	111 - 249	≥ 250		
ACVPU/CNS Response				Alert (A)			Confusion (new) (C), Voice (V), Pain (P), Unresponsive (U)
Temp (°C)	≤ 35.0		35.1 - 36.0	36.1 - 38.0	38.1 - 39.0	≥ 39.1	

INEWS allocates 0-3 points to measurements of each of the 7 physiological parameters. A score of 0 represents least risk while a score of 3 represents highest risk

About recognising small changes

Documentation of observations over time demonstrates the patient's individual baseline and trends, which assist in the recognition of the small changes that may signal early deterioration.

Observe the patient

- Introduce yourself
- Situation awareness
  - Current concerns
  - Physiological observations
- Background/reason for admission
- Assessment of the patient
  - Is there a problem?
  - If yes, what IS the problem in your clinical judgement?
- Recommendation for action – what, if any, escalation is needed?

Healthcare worker (HCW), Patient, Family or Carer Concern

New in INEWS V2

- Concern is not scored but triggers patient review by a nurse or escalation for medical review, regardless of a low or no INEWS score. *Insert 'HCW' or 'H', 'P' or 'F' as appropriate*
- If a HCW, patient, family or carer reports concern, a full assessment and a complete set of INEWS observations should be undertaken

Respiratory Rate (RR)

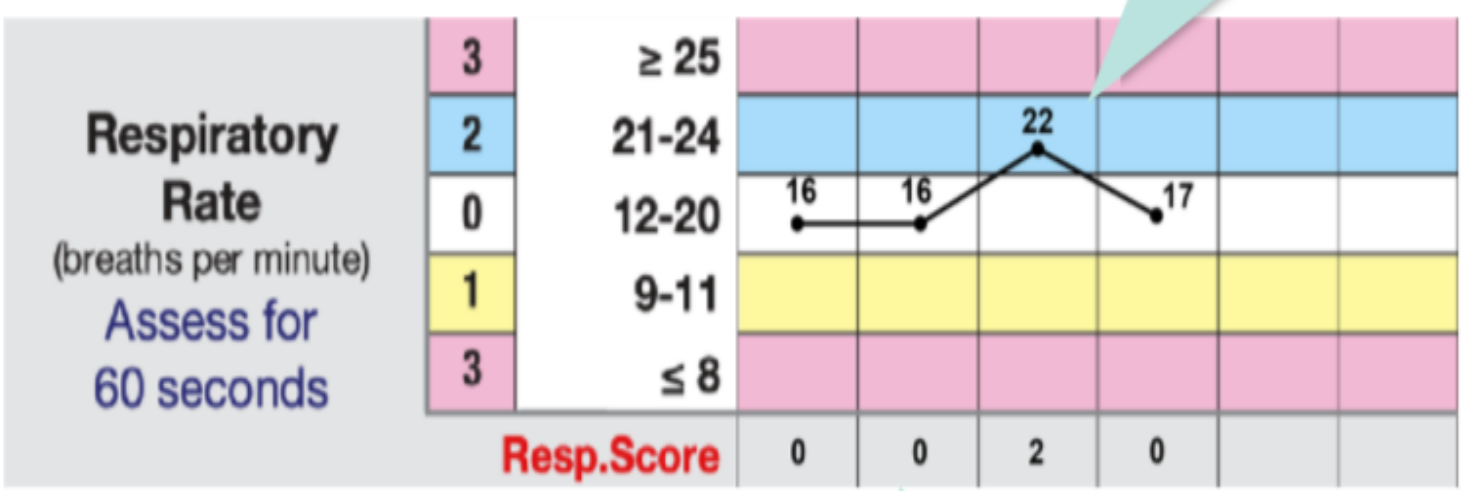
Changes in RR are the earliest sign of deterioration:

- Consider affect of patient position on respiration
- Count the RR for ***a full 60 seconds***
- Assess work of breathing including use of accessory muscles
- Is the chest moving bilaterally?
- Look at trends in RR
- Know the patient's baseline rate

Deteriorating Patient Improvement Programme

What is the normal rate?

Apply RR as a number and a dot and join with trend line.



Apply the INEWS score for RR as per the INEWS scoring key.

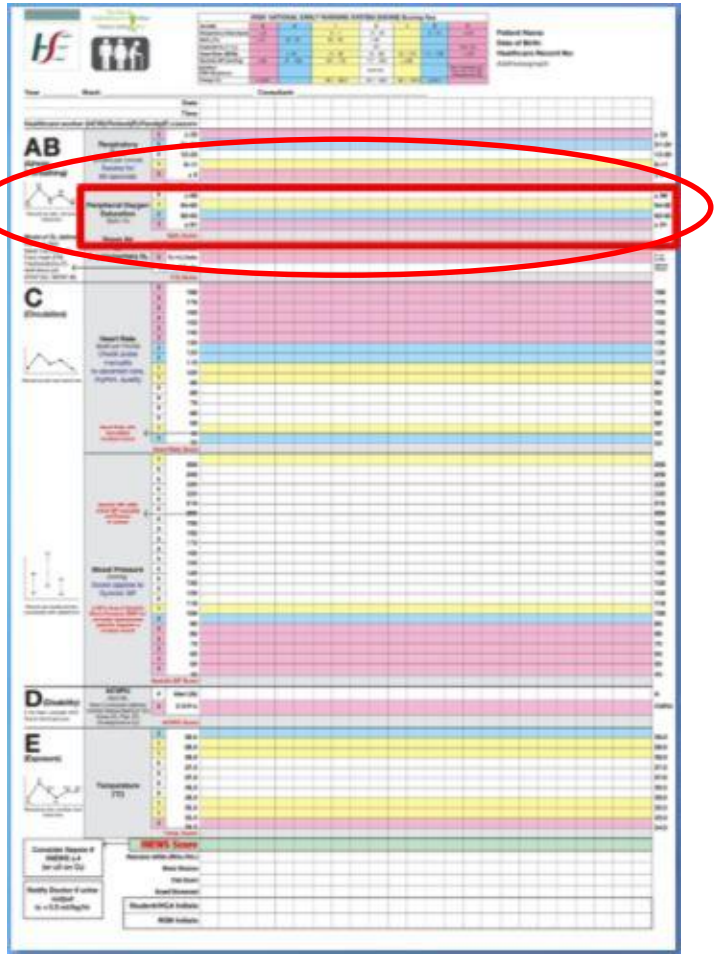
The normal respiratory rate in adults (as per INEWS parameter ranges) is 12-20 breaths per minute. Some patients with a confirmed diagnosis of chronic respiratory conditions may have a higher baseline respiratory rate.

Deteriorating Patient Improvement Programme

SpO_2

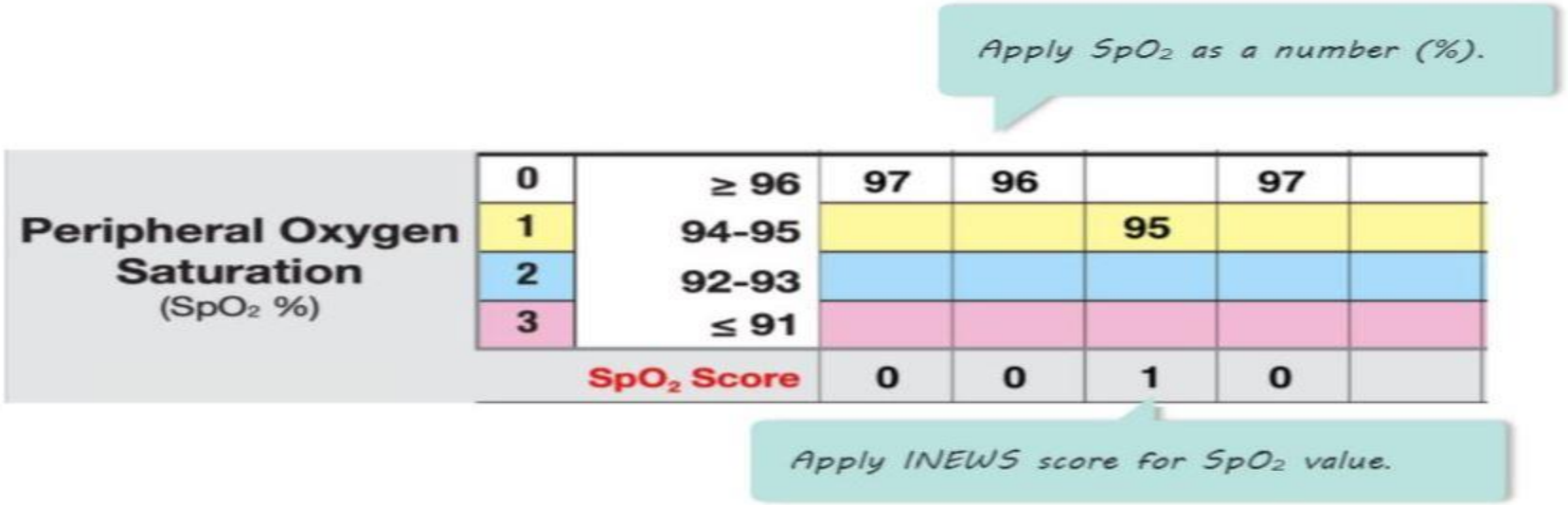
O_2 saturation (SpO_2) is recorded here

- SpO_2 is the '5th vital sign' and should be checked by trained staff using pulse oximetry in all breathless and acutely ill patients
- Increasing supplemental O_2 to maintain targeted SpO_2 indicates deterioration and should be escalated without delay



Deteriorating Patient Improvement Programme

Recording the SpO_2



- INEWS parameters identify normal SpO_2 as ≥96%
- Some patients with confirmed diagnosis of chronic respiratory conditions may have lower baseline SpO_2 levels and a specific plan of care may be required

Deteriorating Patient Improvement Programme

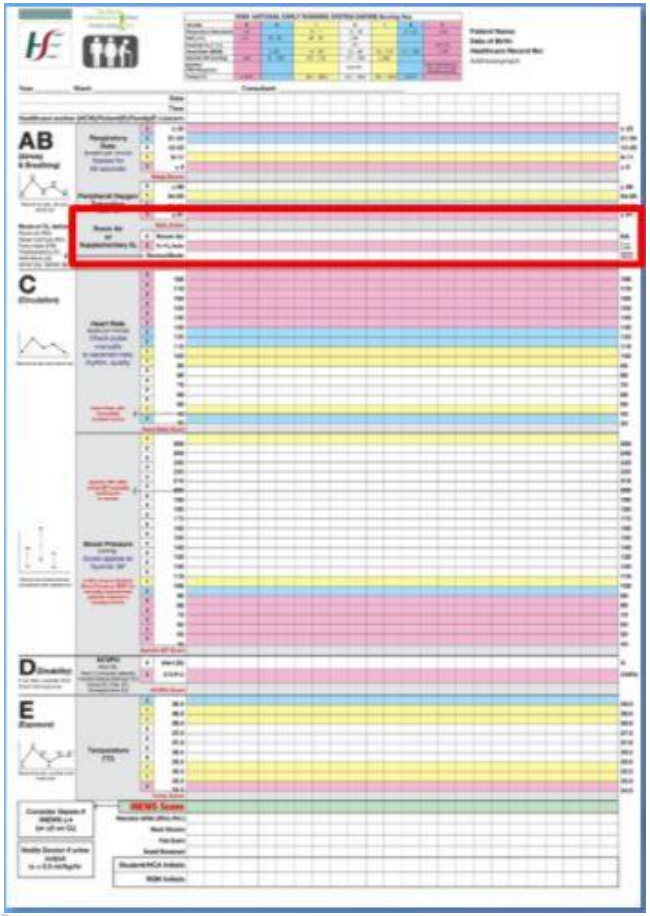
Causes of inaccurate SpO_2 readings

- Poor peripheral circulation
- Shivering or restlessness
- Carbon monoxide/smoke inhalation
- Nail varnish/synthetic nails
- Anaemia
- Inappropriately sized probes or dirty probe sensors

Deteriorating Patient Improvement Programme

Room Air/Supplemental O_2

Room air/Supplemental O_2 is recorded here.



Oxygen delivery devices are included in the chart.

- **All deteriorating patients should receive supplemental oxygen**
- **INEWS assigns a score of '3' to 'any O_2'**
- **The mode of O_2 delivery is documented**
- **When O_2 is prescribed the target SpO_2 should also be prescribed on the drug chart.**

Deteriorating Patient Improvement Programme

Measuring the heart rate

Count for 60 seconds.

Consider factors such as:

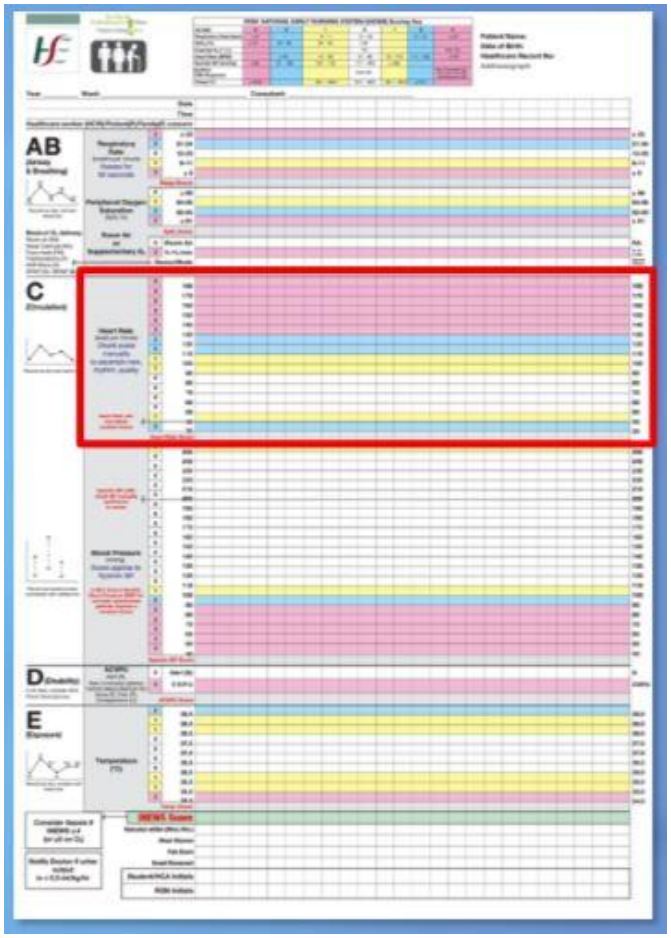
- Rhythm
- Volume
- Pulse quality (irregular, bounding or weak)
- Skin condition (dry, sweaty or clammy)

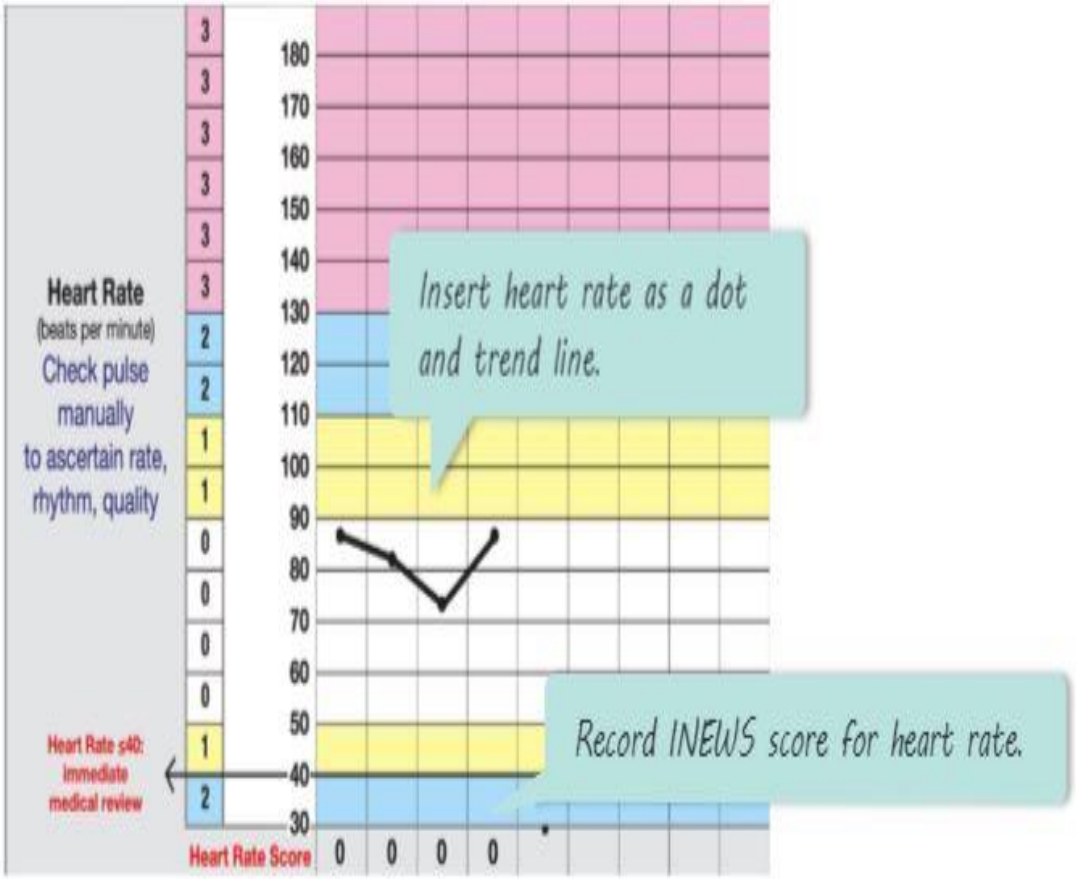
Measuring the heart rate

- Bradycardia of ≤40 requires immediate medical review and more frequent monitoring
- Patients being monitored electronically should have their HR checked manually on a regular basis to determine amplitude and volume (as well as rate and rhythm)

Heart Rate

Heart rate is recorded here



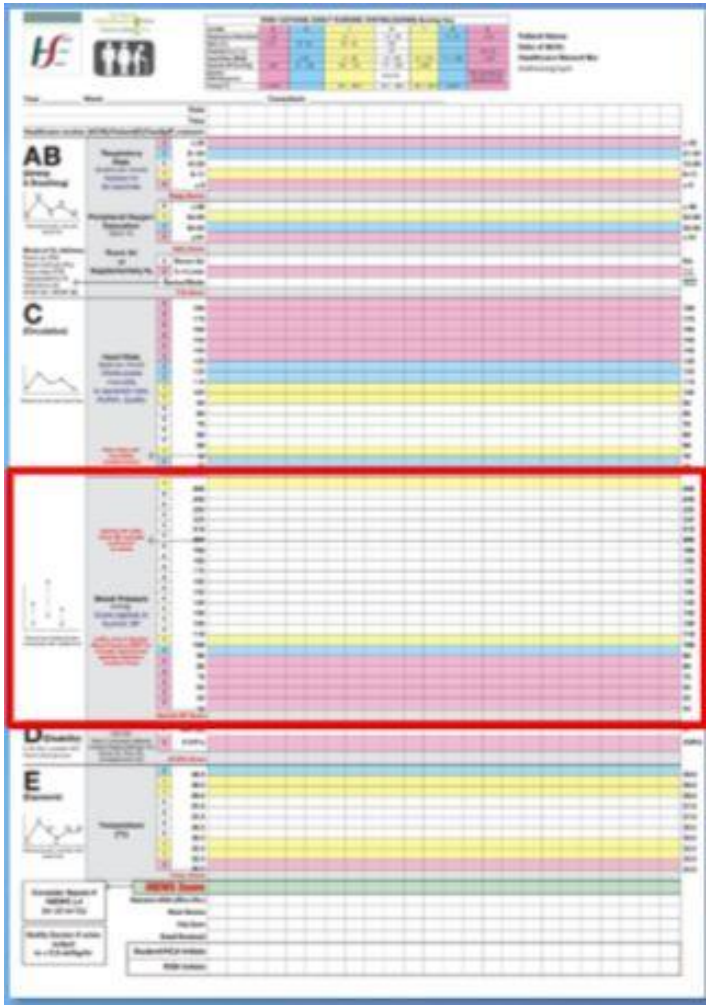


Deteriorating Patient Improvement Programme

Blood Pressure

BP is recorded here

- Establish baseline and identify trends over time
- A normally hypertensive patient may be relatively hypotensive even if their SBP is within normal INEWS parameters
- If systolic BP is ≥ 200 mmHg, urgent medical review is needed

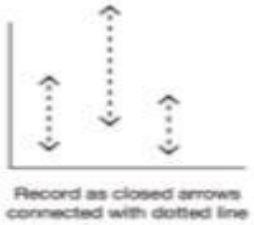


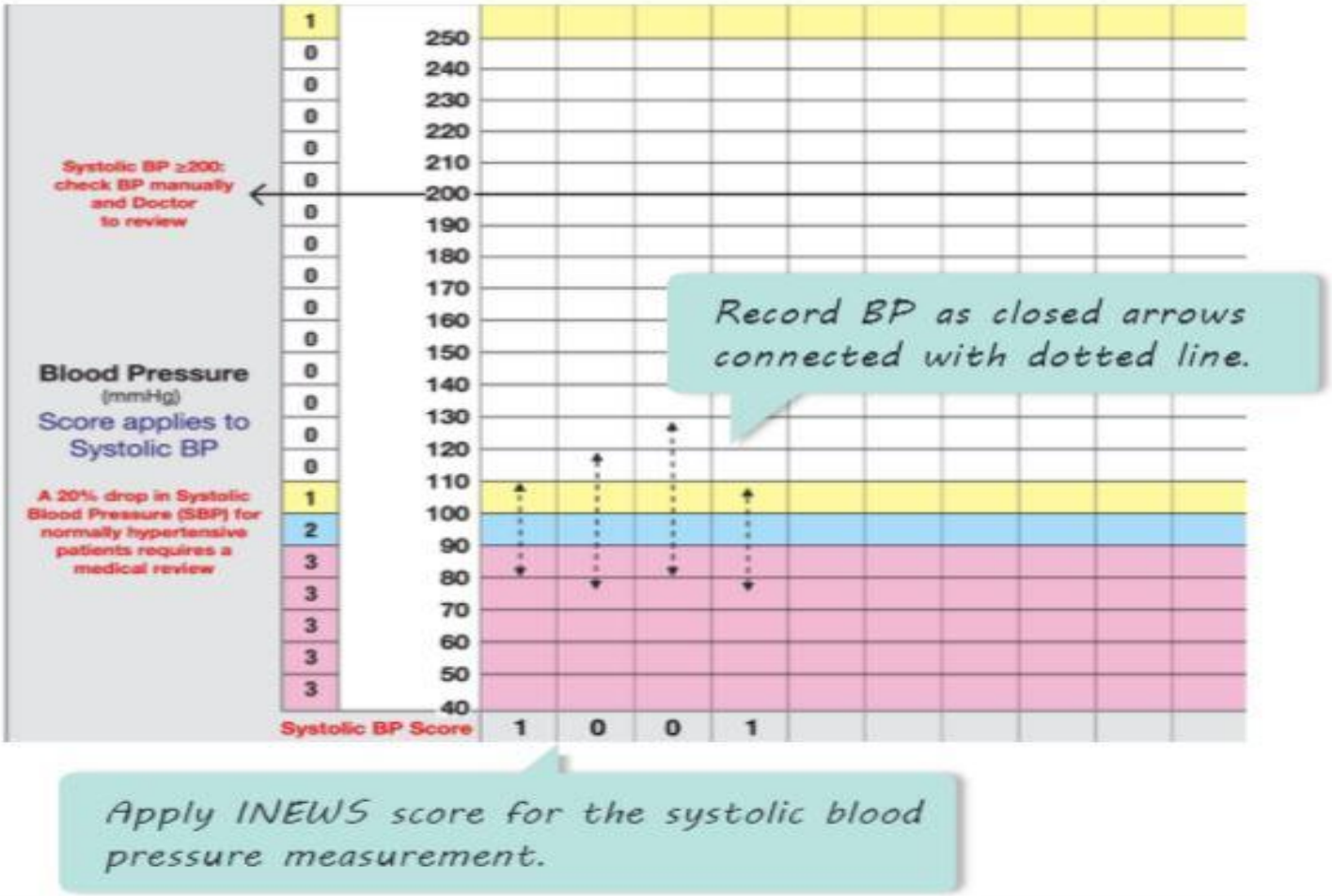
Deteriorating Patient Improvement Programme

Blood Pressure

- Patients having BP measured electronically should have BP checked manually on a regular basis
- Refer to primary physician for guidance on response to lying and standing BP recordings
- Following two failed attempts at electronic BP measurement, a manual BP should be measured
- Ensure correct cuff size

Blood Pressure





Deteriorating Patient Improvement Programme

Disability (Neurological Response)

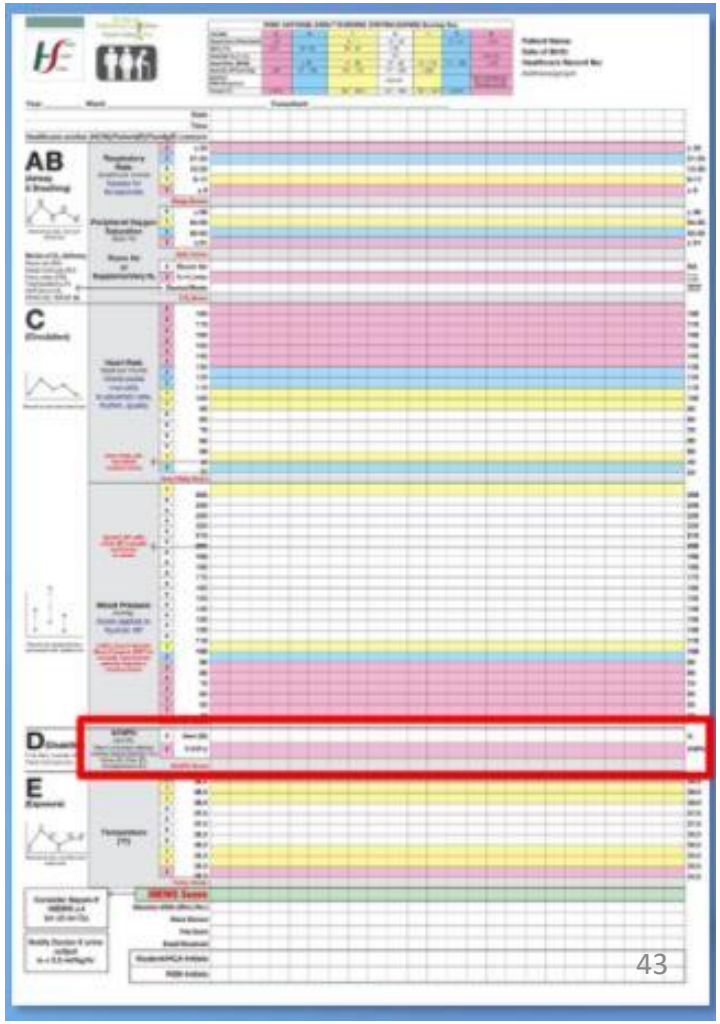
New in INEWS V2

ACVPU (C = new confusion)

Neurological response is measured here.

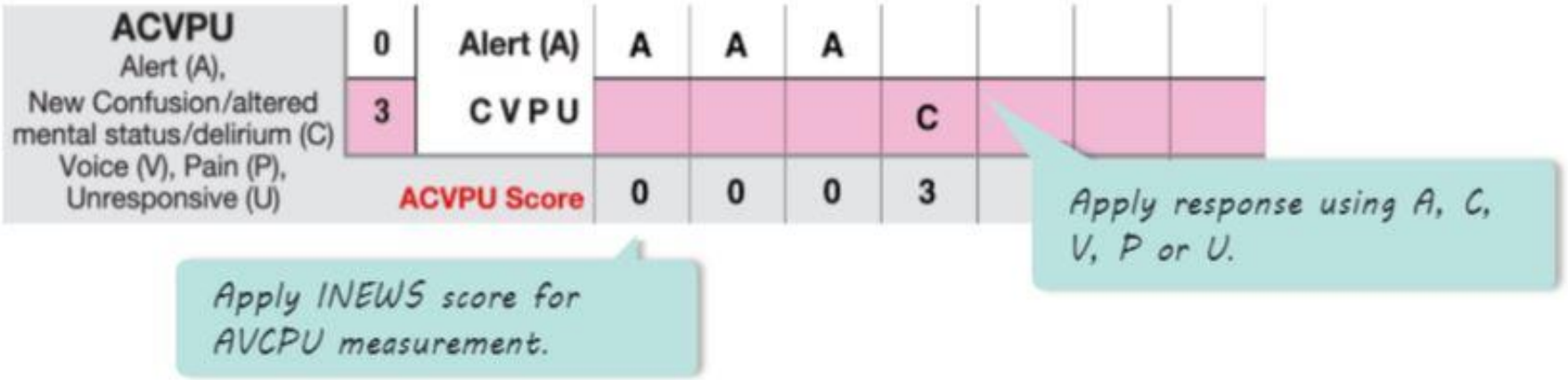
- ‘New’ confusion, altered mental status or delirium is a common finding in acute illness
- Hypoxia can cause confusion or depressed level of consciousness
- Check blood glucose
- Think Sepsis

Use ACVPU scale to assess neurological response. If ACVPU scores 3 complete the Glasgow Coma Scale



Deteriorating Patient Improvement Programme

Disability (Neurological Response)

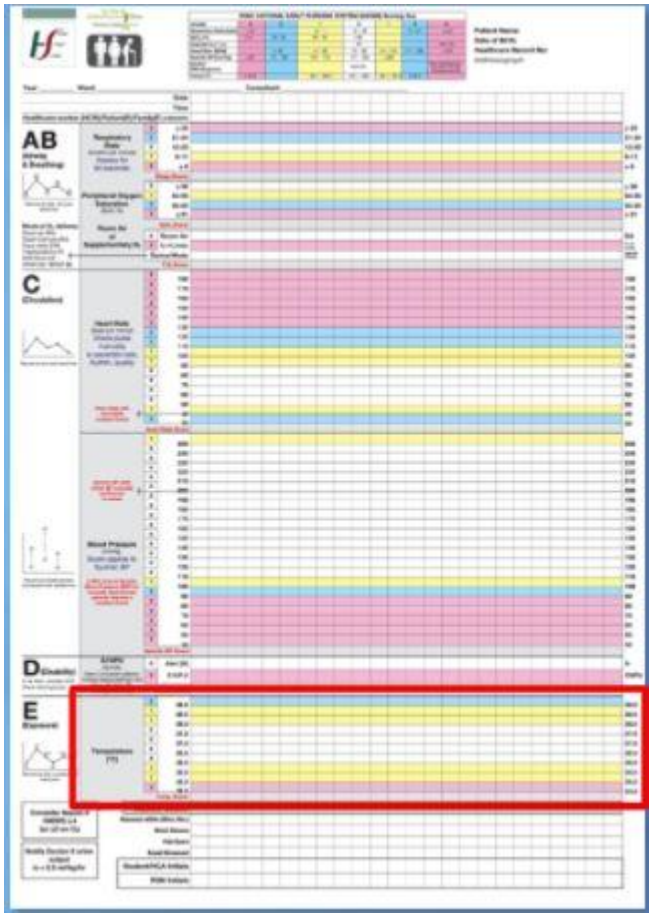


Notes about neurological response:

- **A (Alert):** Patient is alert and oriented to person, place, time and event.
- **C**: New confusion or altered mental status or delirium has been identified as an early sign of deterioration and is thus now included as 'C' in ACVPU. Consult family to establish the patient's baseline and assume the patient has new confusion until proven otherwise. A patient may respond to questions coherently, i.e., they may be orientated in person, place and time, but may still be confused or have altered mental status and/or agitation. If a patient's baseline is confirmed as 'confusion' (pre-existing/persistent) this is taken as their normal status and they are scored accordingly.
- **V (Voice)**: The patient responds to verbal stimuli only.
- **P (Pain)**: The patient responds to painful stimuli only with a purposeful or non-purposeful movement.
- **U (Unresponsive)**: The patient does not respond to stimuli.

Temperature

Temperature is recorded here.

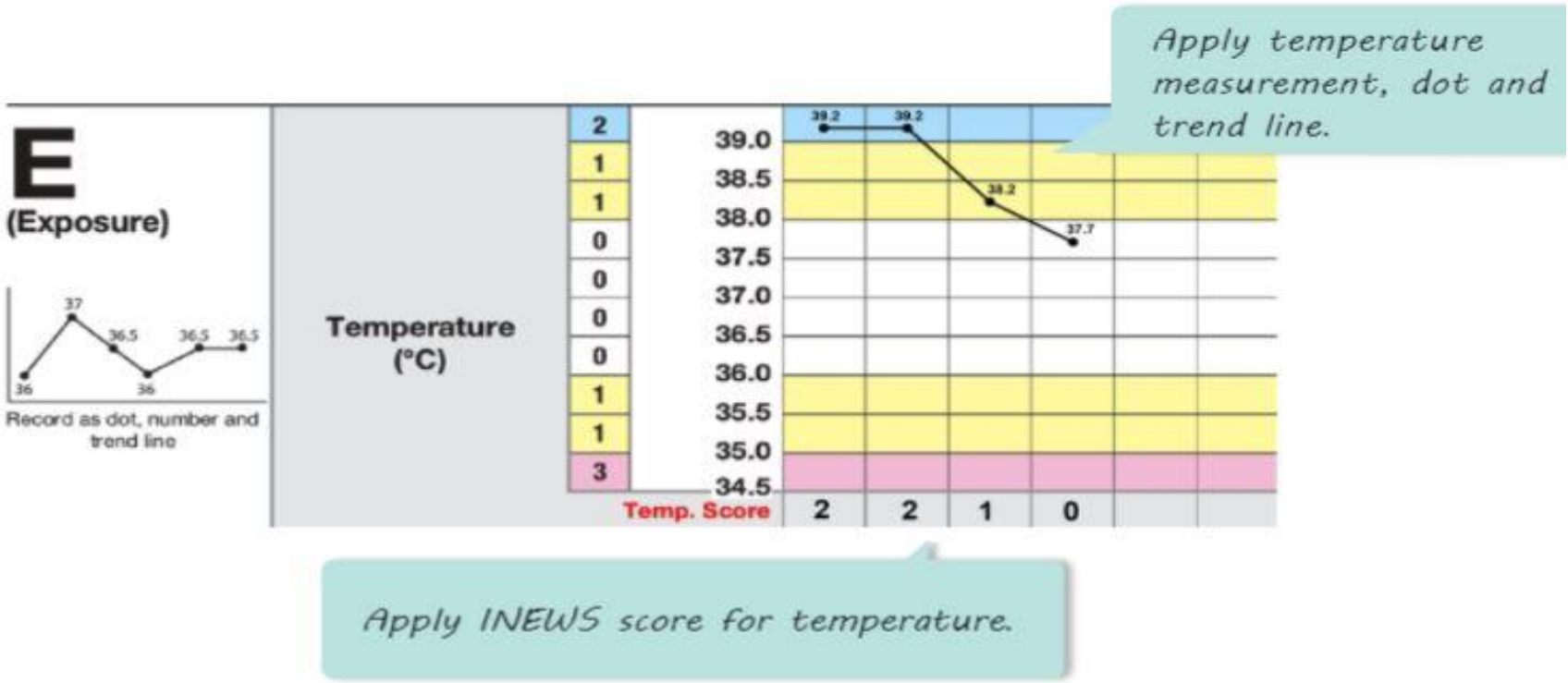


INEWS temperature parameter ranges are as follows

- **Normal range** is 36.1°C - 38°C
- **Hypothermia:** Core temperature of <35°C
- **Hyperthermia** extends from low grade pyrexia (38.1°C) to hyperpyrexia (≥40°C)

Deteriorating Patient Improvement Programme

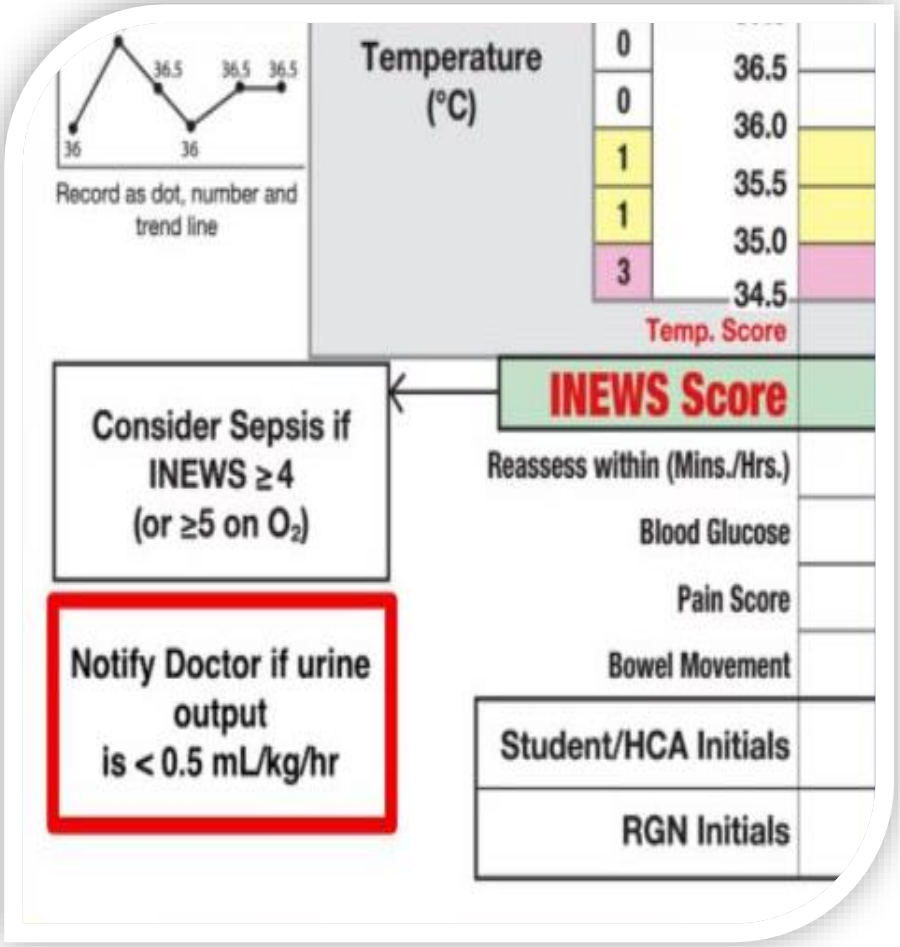
Temperature



Temperatures should be recorded at the appropriate site (e.g tympanic, axillary etc) according to your local hospital/acute setting guidelines. Ideally the same site should be used to allow for comparison.

Urine Output

- Small window of opportunity to recognise Acute Kidney Injury (AKI) to prevent acute renal failure
- Monitor fluid balance accurately



Deteriorating Patient Improvement Programme

Calculating the INEWS SCORE

Review the parameters

Here are the parameters with the scores as shown for the four sets of observations used in the earlier slides.

Resp.Score	0	0	2	0
SpO_2 Score	0	0	1	0
F_iO_2 Score	0	0	3	0
Heart Rate Score	0	0	0	0
Systolic BP Score	1	0	0	1
ACVPU Score	0	0	0	3
Temp. Score	2	2	1	0
INEWS Score	3	2	7	4

Add each column to calculate the INEWS score for each set of observations.

Deteriorating Patient Improvement Programme

Calculating the INEWS SCORE

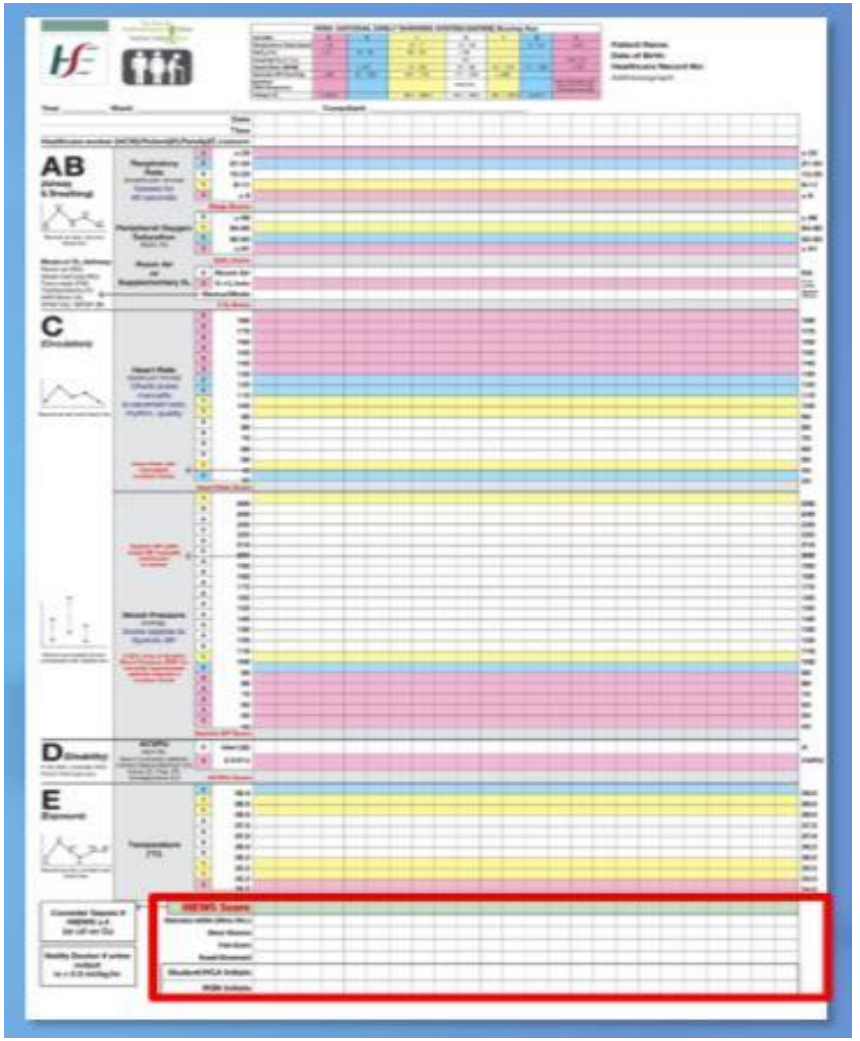
Add the score for each of the seven INEWS parameters to obtain INEWS Score

Enter the patient's INEWS score into the green 'INEWS Score' row

INEWS Score																								
Reassess within (Mins./Hrs.)																								
Blood Glucose																								
Pain Score																								
Bowel Movement																								
Student/HCA Initials																								
RGN Initials																								

Single-score triggers:

Score of 3 in any single parameter or a score of 2 for heart rate ≤ 40 requires immediate escalation and increase in monitoring frequency



Deteriorating Patient Improvement Programme

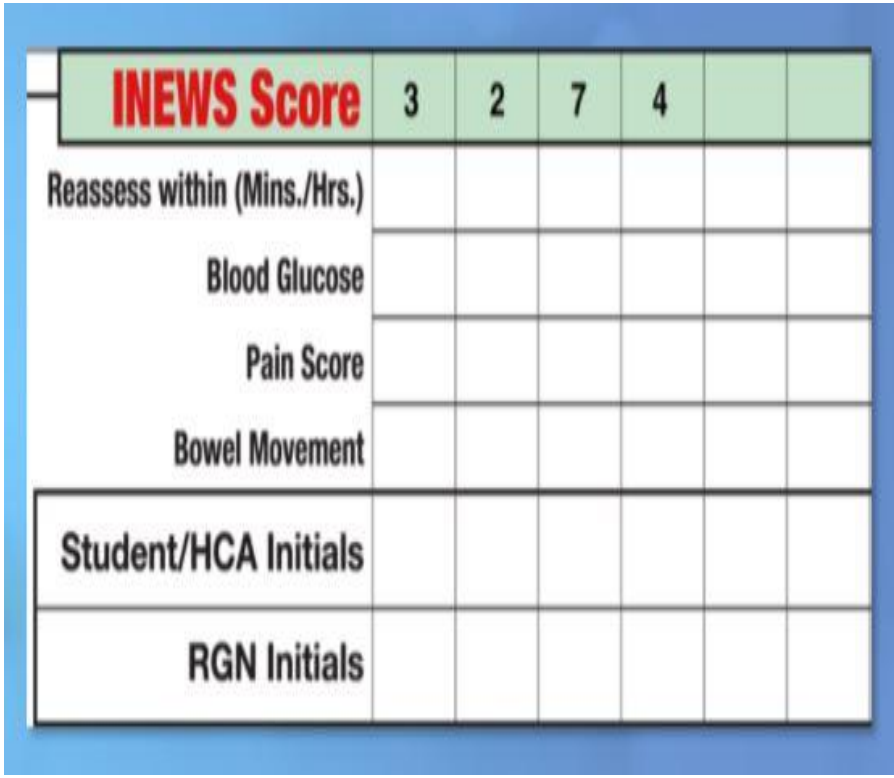
Reassess within (Mins/Hrs)

Frequency of patient monitoring is determined by:

- Patient's clinical condition
- Clinical judgement
- INEWS score

Document:

- When the next patient assessment is due



INEWS Score	3	2	7	4		
Reassess within (Mins./Hrs.)						
Blood Glucose						
Pain Score						
Bowel Movement						
Student/HCA Initials						
RGN Initials						

Knowledge Check

Which of the following statements are true?

a. Normal respiratory rate in adults as per INEWS is 12-20 breaths per minute

b. Normal SpO_2 is ≥96%

c. For FiO_2 if a patient is on any inspired oxygen, a sco is inserted

d. When measuring heart rate, count for 30 seconds

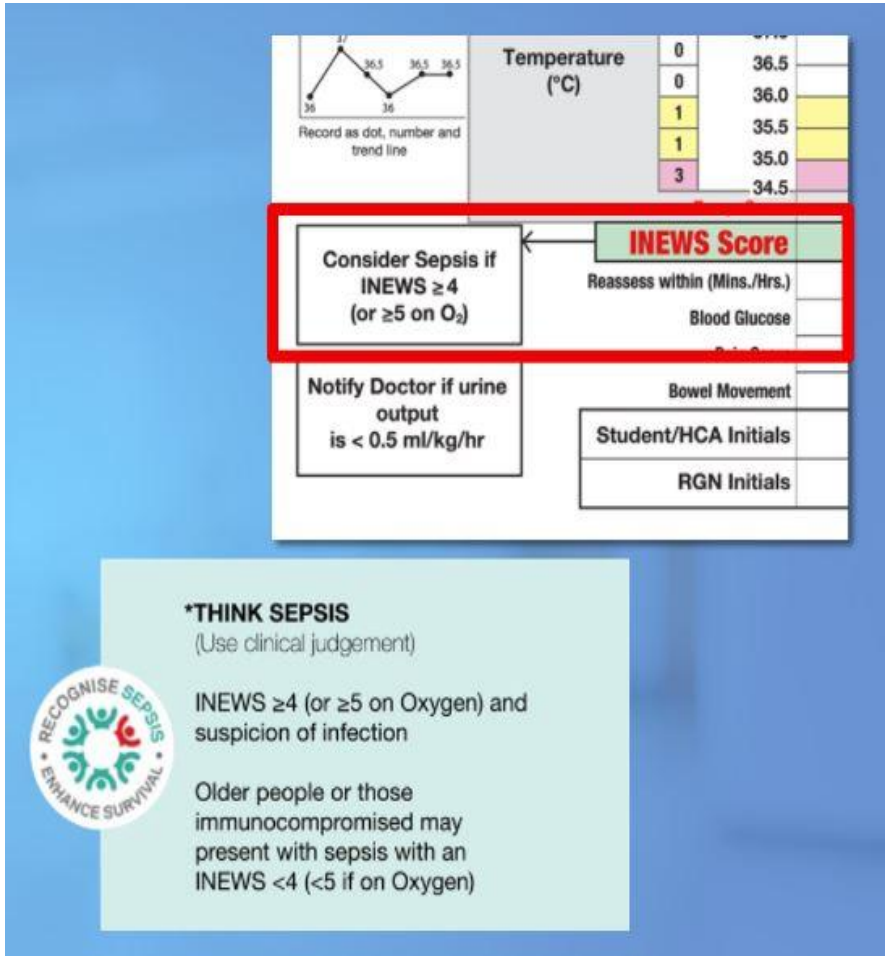
e. If systolic BP is ≥ 200 mmHg, an urgent medical rev required

f. Normal temperature range is 36.1°C - 38°C

When to think Sepsis

Think sepsis if there is an INEWS score ≥4 (or ≥5 if on O_2) and a suspicion of infection

Use clinical judgement, particularly for older patients or immunocompromised patients as they can have sepsis despite an INEWS of <4 (or < 5 if on O_2)



Deteriorating Patient Improvement Programme

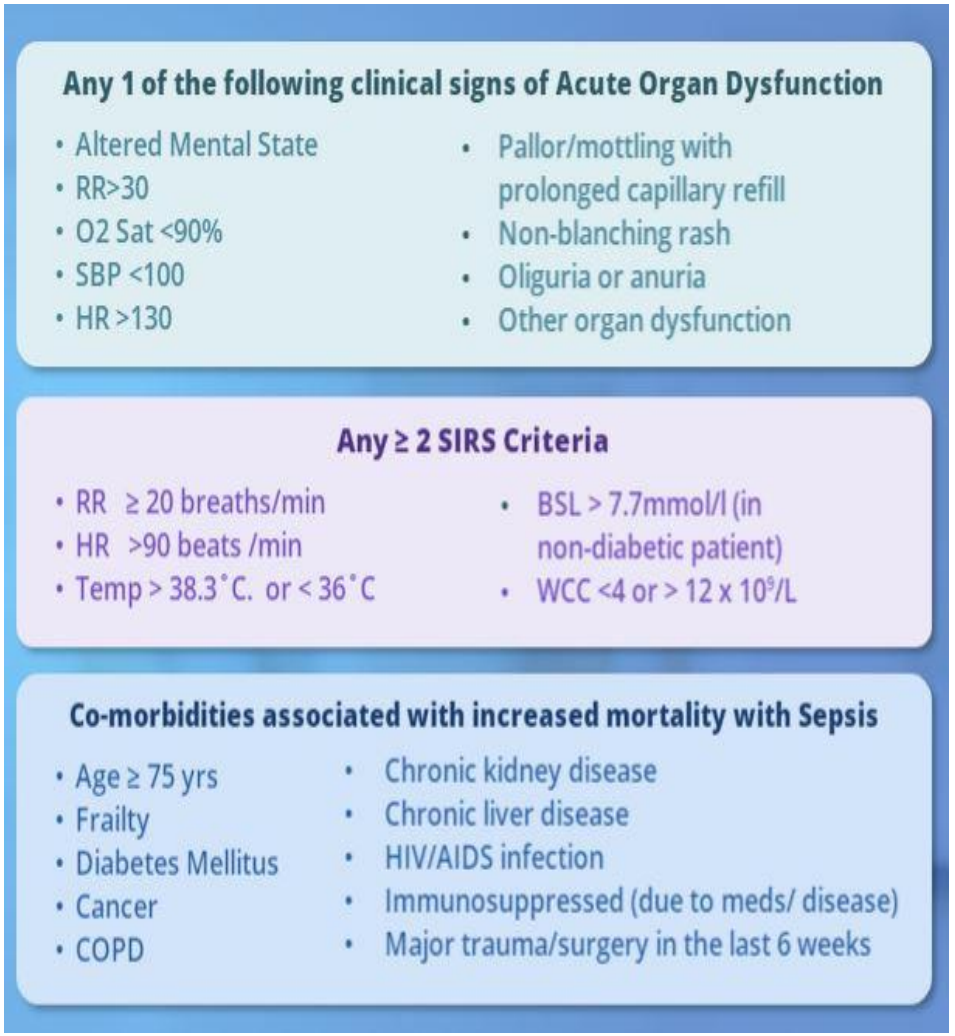
When to think Sepsis

If infection is suspected, THINK SEPSIS and check for:

1. Risk of neutropenia **OR**

2. Clinically apparent new-onset organ failure as a result of infection; **OR**

3. Systemic inflammatory response (≥2 SIRS plus at least ≥1 co-morbidity)



Deteriorating Patient Improvement Programme

When to think Sepsis

If infection is suspected, THINK SEPSIS and check for

1. Risk of neutropenia **OR**
2. Clinically apparent new-onset organ failure as a result of infection; **OR**
3. Systemic inflammatory response (≥2 SIRS plus at least ≥1 co-morbidity)

If all of 1, 2 or 3 are **ABSENT...**

If ALL of 1, 2 or 3 are ABSENT follow usual management pathway and INEWS escalation protocol. However, if there is a deterioration in patient 's clinical condition escalate for medical review.

If any of 1, 2 or 3 are **PRESENT...**

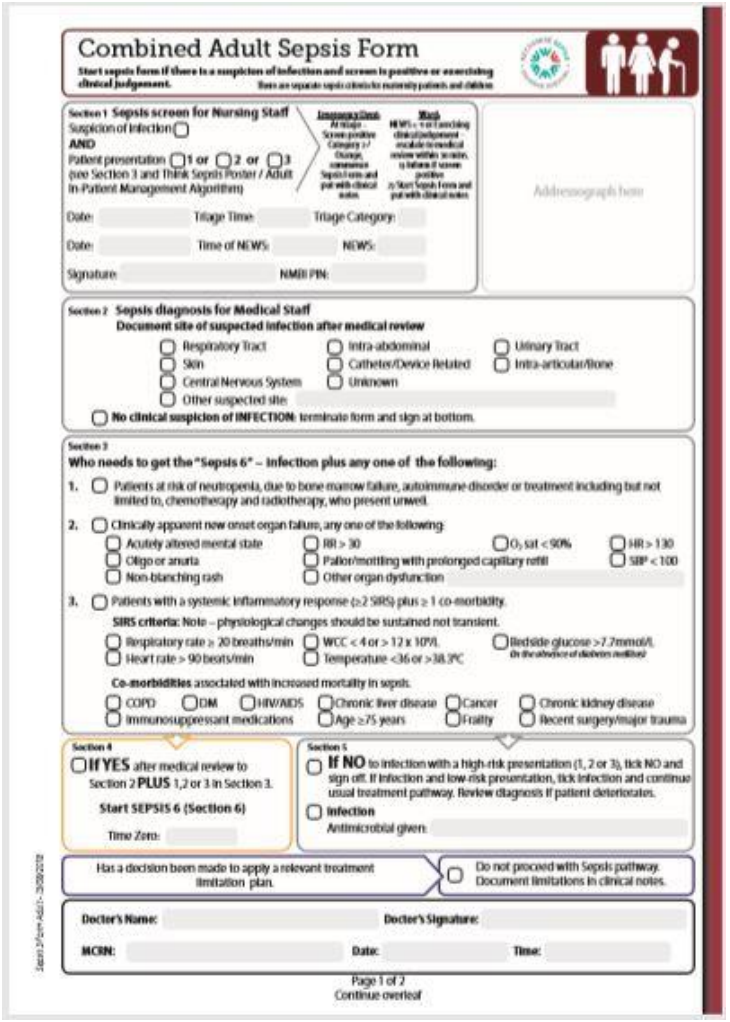
If any of 1, 2 or 3 are present, then suspect sepsis and start the sepsis pathway.

Escalate for medical review if...

Escalate for medical review if there is a deterioration in clinical condition due to an infection, regardless of the patient's INEWS score.

Deteriorating Patient Improvement Programme

Screen for Sepsis



Combined Adult Sepsis Form

Start sepsis form if there is a suspicion of infection and screen is positive or exercising clinical judgement.

Section 1 Sepsis screen for Nursing Staff

Suspicion of Infection ☐
AND
Patient presentation ☐ 1 or ☐ 2 or ☐ 3
(see Section 3 and Think Sepsis Poster / Adult In-Patient Management Algorithm)

Emergency Dept: At triage: Screen positive Category 1-7 Change, commence Sepsis 6 now and put with clinical notes.

Ward: NEWS 1 + on 2 consecutive clinical judgement: escalate to medical review within 30 mins, 1 h before if severe positive 2) Start Sepsis Form and put with clinical notes.

Addressograph here

Date: Triage Time: Triage Category:
Date: Time of NEWS: NEWS:
Signature: NMBI PIN:

Section 2 Sepsis diagnosis for Medical Staff
Document site of suspected infection after medical review

☐ Respiratory Tract ☐ Intra-abdominal ☐ Urinary Tract
☐ Skin ☐ Catheter/Device Related ☐ Intra-articular/Bone
☐ Central Nervous System ☐ Unknown
☐ Other suspected site:

☐ No clinical suspicion of INFECTION: terminate form and sign at bottom.

Section 3
Who needs to get the "Sepsis 6" – infection plus any one of the following:

1. ☐ Patients at risk of neutropenia, due to bone marrow failure, autoimmune disorder or treatment including but not limited to, chemotherapy and radiotherapy, who present unwell.
2. ☐ Clinically apparent new onset organ failure, any one of the following:
   ☐ Acutely altered mental state ☐ RR > 30 ☐ O_2 sat < 90% ☐ HR > 130
   ☐ Oligo or anuria ☐ Pallor/mottling with prolonged capillary refill ☐ SBP < 100
   ☐ Non-blanching rash ☐ Other organ dysfunction
3. ☐ Patients with a systemic inflammatory response (≥2 SIRS) plus ≥ 1 co-morbidity.

SIRS criteria: Note – physiological changes should be sustained not transient.
☐ Respiratory rate ≥ 20 breaths/min ☐ WCC < 4 or > 12 x 10⁹/L ☐ Bedside glucose >7.7mmol/L (In the absence of diabetes mellitus)
☐ Heart rate > 90 beats/min ☐ Temperature <36 or >38.3°C

Co-morbidities associated with increased mortality in sepsis.
☐ COPD ☐ DM ☐ HIV/AIDS ☐ Chronic liver disease ☐ Cancer ☐ Chronic kidney disease
☐ Immunosuppressant medications ☐ Age ≥75 years ☐ Frailty ☐ Recent surgery/major trauma

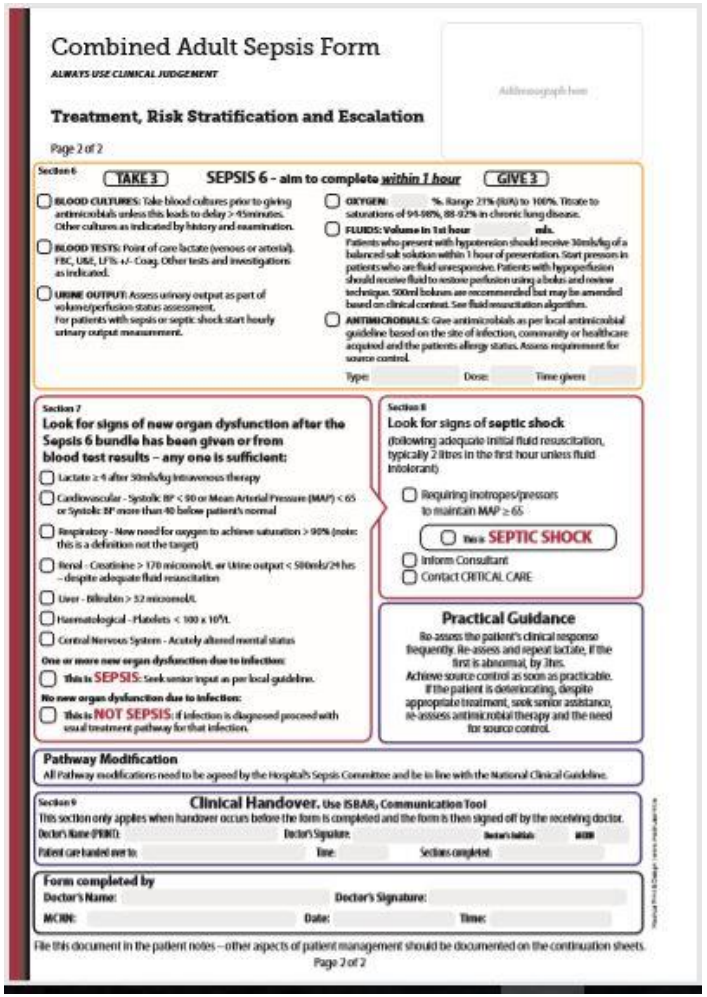
Section 4
☐ If YES after medical review to Section 2 PLUS 1,2 or 3 in Section 3.
Start SEPSIS 6 (Section 6)
Time Zero:

Section 5
☐ If NO to infection with a high-risk presentation (1, 2 or 3), tick NO and sign off. If infection and low-risk presentation, tick Infection and continue usual treatment pathway. Review diagnosis if patient deteriorates.
☐ Infection
Antimicrobial given:

Has a decision been made to apply a relevant treatment limitation plan.
☐ Do not proceed with Sepsis pathway. Document limitations in clinical notes.

Doctor's Name: Doctor's Signature:
MCRN: Date: Time:

Page 1 of 2
Continue overleaf



Combined Adult Sepsis Form

ALWAYS USE CLINICAL JUDGEMENT

Treatment, Risk Stratification and Escalation

Page 2 of 2

Section 6 — TAKE 3 — SEPSIS 6 - aim to complete within 1 hour — GIVE 3

☐ BLOOD CULTURES: Take blood cultures prior to giving antimicrobials unless this leads to delay > 45minutes. Other cultures as indicated by history and examination.
☐ BLOOD TESTS: Point of care lactate (venous or arterial). FBC, U&E, LFTs +/- Coag. Other tests and investigations as indicated.
☐ URINE OUTPUT: Assess urinary output as part of volume/perfusion status assessment. For patients with sepsis or septic shock start hourly urinary output measurement.
☐ OXYGEN: % Range 21% (RR) to 100%. Titrate to saturations of 94-98%, 88-92% in chronic lung disease.
☐ FLUIDS: Volume in 1st hour mls. Patients who present with hypotension should receive 30ml/kg of a balanced salt solution within 1 hour of presentation. Start pressors in patients who are fluid unresponsive. Patients with hypoperfusion should receive fluid to restore perfusion using a bolus and review technique. 500ml boluses are recommended but may be amended based on clinical context. See fluid resuscitation algorithm.
☐ ANTIMICROBIALS: Give antimicrobials as per local antimicrobial guideline based on the site of infection, community or healthcare acquired and the patients allergy status. Assess requirement for source control.
Type: Dose: Time given:

Section 7
Look for signs of new organ dysfunction after the Sepsis 6 bundle has been given or from blood test results – any one is sufficient:
☐ Lactate ≥ 4 after 30ml/kg intravenous therapy
☐ Cardiovascular - Systolic BP < 90 or Mean Arterial Pressure (MAP) < 65 or Systolic BP more than 40 below patient's normal
☐ Respiratory - New need for oxygen to achieve saturation > 90% (note: this is a definition not the target)
☐ Renal - Creatinine > 170 micromol/L or Urine output < 500mls/24 hrs – despite adequate fluid resuscitation
☐ Liver - Bilirubin > 32 micromol/L
☐ Haematological - Platelets < 100 x 10⁹/L
☐ Central Nervous System - Acutely altered mental status

One or more new organ dysfunction due to infection:
☐ This is SEPSIS: Seek senior input as per local guideline.

No new organ dysfunction due to infection:
☐ This is NOT SEPSIS: If infection is diagnosed proceed with usual treatment pathway for that infection.

Section 8
Look for signs of septic shock
(following adequate initial fluid resuscitation, typically 2 litres in the first hour unless fluid intolerant)
☐ Requiring inotropes/pressors to maintain MAP ≥ 65
☐ This is SEPTIC SHOCK
☐ Inform Consultant
☐ Contact CRITICAL CARE

Practical Guidance
Re-assess the patient's clinical response frequently. Re-assess and repeat lactate, if the first is abnormal, by 3hrs.
Achieve source control as soon as practicable.
If the patient is deteriorating, despite appropriate treatment, seek senior assistance, re-assess antimicrobial therapy and the need for source control.

Pathway Modification
All Pathway modifications need to be agreed by the Hospital's Sepsis Committee and be in line with the National Clinical Guideline.

Section 9
Clinical Handover. Use ISBAR, Communication Tool
This section only applies when handover occurs before the form is completed and the form is then signed off by the receiving doctor.
Doctor's Name (PRINT): Doctor's Signature: Doctor's Initials: MCRN:
Patient care handed over to: Time: Sections completed:

Form completed by
Doctor's Name: Doctor's Signature:
MCRN: Date: Time:

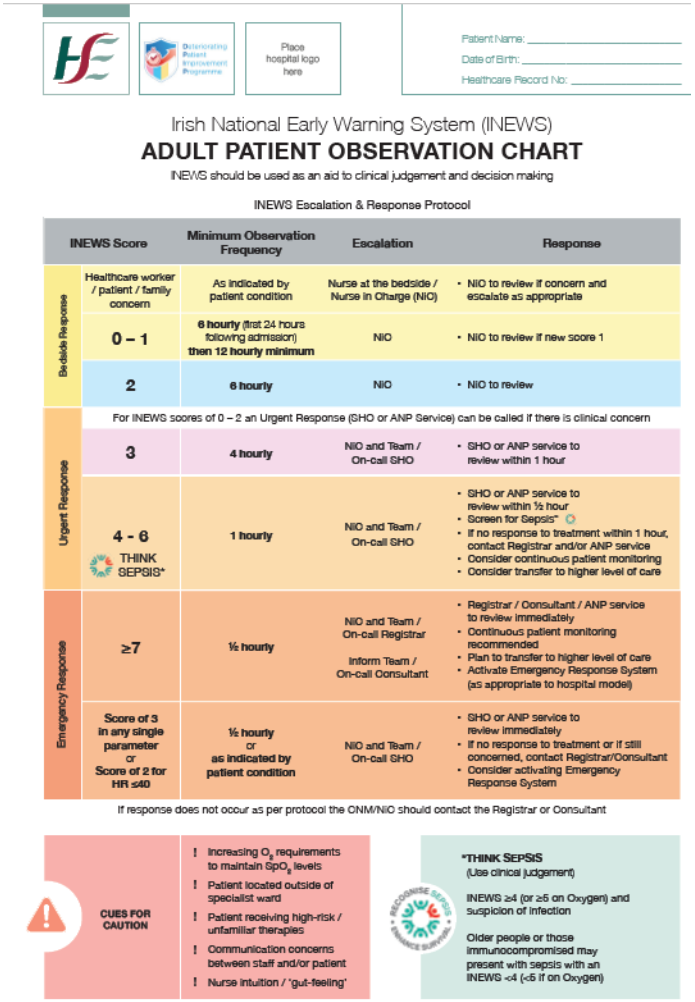
File this document in the patient notes – other aspects of patient management should be documented on the continuation sheets.
Page 2 of 2

Deteriorating Patient Improvement Programme

INEWS Escalation and Response

Calculate INEWS score and escalate care as per the INEWS Escalation and Response Protocol

Alert Nurse in Charge of any escalation or concern



Place hospital logo here

Patient Name: _____
Date of Birth: _____
Healthcare Record No: _____

Irish National Early Warning System (INEWS)

ADULT PATIENT OBSERVATION CHART

INEWS should be used as an aid to clinical judgement and decision making

INEWS Escalation & Response Protocol

	INEWS Score	Minimum Observation Frequency	Escalation	Response
Bedside Response	Healthcare worker / patient / family concern	As indicated by patient condition	Nurse at the bedside / Nurse in Charge (NiC)	• NiC to review if concern and escalate as appropriate
	0 – 1	**6 hourly** (first 24 hours following admission) **then 12 hourly minimum**	NiC	• NiC to review if new score 1
	2	**6 hourly**	NiC	• NiC to review
Urgent Response	For INEWS scores of 0 – 2 an Urgent Response (SHO or ANP Service) can be called if there is clinical concern			
	3	**4 hourly**	NiC and Team / On-call SHO	• SHO or ANP service to review within 1 hour
	4 - 6 THINK SEPSIS*	**1 hourly**	NiC and Team / On-call SHO	• SHO or ANP service to review within ½ hour • Screen for Sepsis* • If no response to treatment within 1 hour, contact Registrar and/or ANP service • Consider continuous patient monitoring • Consider transfer to higher level of care
Emergency Response	≥7	**½ hourly**	NiC and Team / On-call Registrar Inform Team / On-call Consultant	• Registrar / Consultant / ANP service to review immediately • Continuous patient monitoring recommended • Plan to transfer to higher level of care • Activate Emergency Response System (as appropriate to hospital model)
	Score of 3 in any single parameter or Score of 2 for HR ≤40	**½ hourly or as indicated by patient condition**	NiC and Team / On-call SHO	• SHO or ANP service to review immediately • If no response to treatment or if still concerned, contact Registrar/Consultant • Consider activating Emergency Response System

If response does not occur as per protocol the ONM/NiC should contact the Registrar or Consultant

CUES FOR CAUTION

- ! Increasing O_2 requirements to maintain SpO_2 levels
- ! Patient located outside of specialist ward
- ! Patient receiving high-risk / unfamiliar therapies
- ! Communication concerns between staff and/or patient
- ! Nurse intuition / 'gut-feeling'

***THINK SEPSIS**
(Use clinical judgement)

INEWS ≥4 (or ≥5 on Oxygen) and suspicion of infection

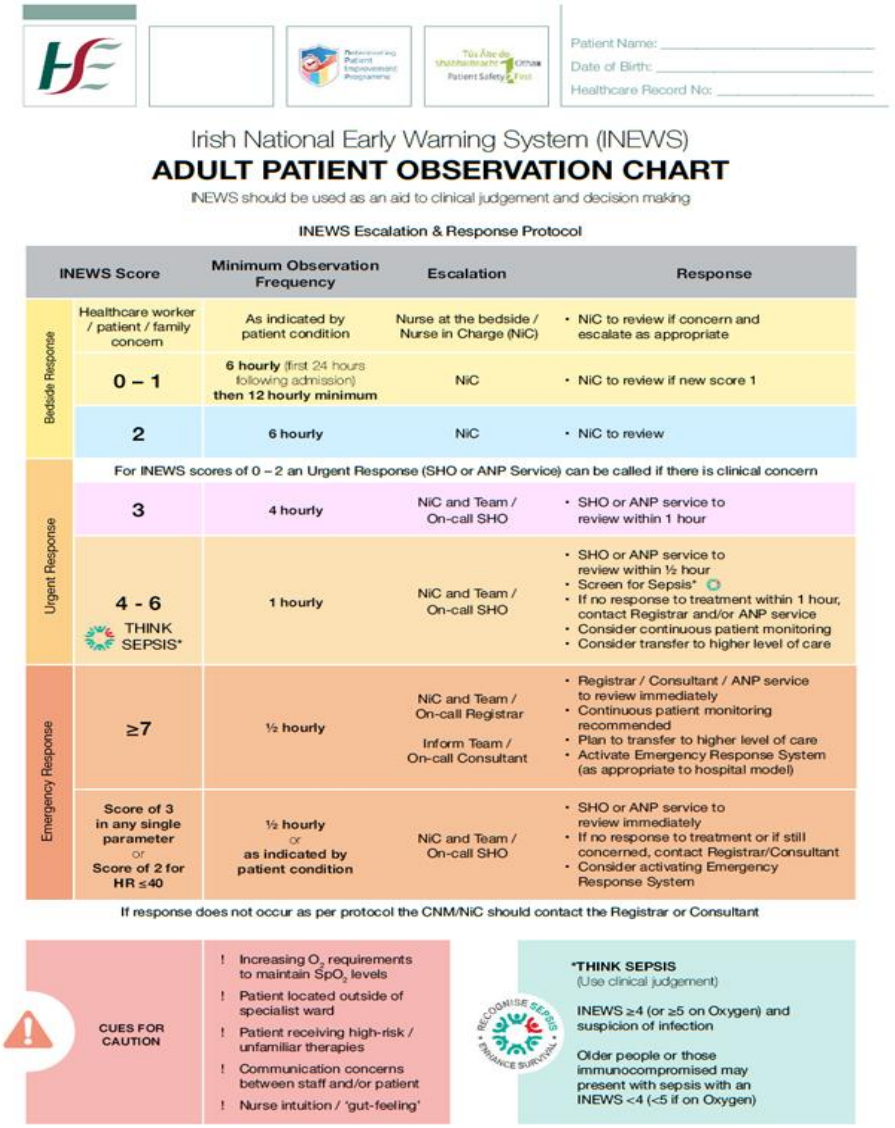
Older people or those immunocompromised may present with sepsis with an INEWS <4 (<5 if on Oxygen)

Deteriorating Patient Improvement Programme

Summary

- Healthcare worker/patient/family/carer concern is an important indicator of patient deterioration
- Early indicators of deterioration are changes in respiratory rate and new confusion/altered mental status/delirium
- An increasing requirement for supplemental oxygen to maintain target SpO_2 levels is a clear sign of deterioration and requires immediate medical review
- There is a small window of opportunity to recognise Acute Kidney Injury (AKI) to prevent acute renal failure; monitor urine output accurately
- Accurate measurement and calculation of the INEWS score are critical to improving patient outcomes

INEWS Escalation and Response



Patient Name: _____
Date of Birth: _____
Healthcare Record No: _____

Irish National Early Warning System (INEWS)

ADULT PATIENT OBSERVATION CHART

INEWS should be used as an aid to clinical judgement and decision making

INEWS Escalation & Response Protocol

	INEWS Score	Minimum Observation Frequency	Escalation	Response
Bedside Response	Healthcare worker / patient / family concern	As indicated by patient condition	Nurse at the bedside / Nurse in Charge (NiC)	• NiC to review if concern and escalate as appropriate
	0 – 1	**6 hourly** (first 24 hours following admission) **then 12 hourly minimum**	NiC	• NiC to review if new score 1
	2	**6 hourly**	NiC	• NiC to review
Urgent Response	For INEWS scores of 0 – 2 an Urgent Response (SHO or ANP Service) can be called if there is clinical concern			
	3	**4 hourly**	NiC and Team / On-call SHO	• SHO or ANP service to review within 1 hour
	4 - 6 THINK SEPSIS*	**1 hourly**	NiC and Team / On-call SHO	• SHO or ANP service to review within ½ hour • Screen for Sepsis* • If no response to treatment within 1 hour, contact Registrar and/or ANP service • Consider continuous patient monitoring • Consider transfer to higher level of care
Emergency Response	**≥7**	**½ hourly**	NiC and Team / On-call Registrar Inform Team / On-call Consultant	• Registrar / Consultant / ANP service to review immediately • Continuous patient monitoring recommended • Plan to transfer to higher level of care • Activate Emergency Response System (as appropriate to hospital model)
	Score of 3 in any single parameter or **Score of 2 for HR ≤40**	**½ hourly** or **as indicated by patient condition**	NiC and Team / On-call SHO	• SHO or ANP service to review immediately • If no response to treatment or if still concerned, contact Registrar/Consultant • Consider activating Emergency Response System

If response does not occur as per protocol the CNM/NiC should contact the Registrar or Consultant

CUES FOR CAUTION

- ! Increasing O_2 requirements to maintain SpO_2 levels
- ! Patient located outside of specialist ward
- ! Patient receiving high-risk / unfamiliar therapies
- ! Communication concerns between staff and/or patient
- ! Nurse intuition / 'gut-feeling'

***THINK SEPSIS**
(Use clinical judgement)

INEWS ≥4 (or ≥5 on Oxygen) and suspicion of infection

Older people or those immunocompromised may present with sepsis with an INEWS <4 (<5 if on Oxygen)

Deteriorating Patient Improvement Programme

Determinants for escalating care:

- Clinical judgement
- Healthcare worker, patient or family concern
- Intuition/gut-feeling
- INEWS score
- Escalation and Response Protocol

INEWS Escalation & Response Protocol

	INEWS Score	Minimum Observation Frequency	Escalation	Response
Bedside Response	Healthcare worker / patient / family concern	As indicated by patient condition	Nurse at the bedside / Nurse in Charge (NiC)	• NiC to review if concern and escalate as appropriate
	0 – 1	**6 hourly** (first 24 hours following admission) **then 12 hourly minimum**	NiC	• NiC to review if new score 1
	2	**6 hourly**	NiC	• NiC to review
Urgent Response	For INEWS scores of 0 – 2 an Urgent Response (SHO or ANP Service) can be called if there is clinical concern			
	3	**4 hourly**	NiC and Team / On-call SHO	• SHO or ANP service to review within 1 hour
	4 - 6 THINK SEPSIS*	**1 hourly**	NiC and Team / On-call SHO	• SHO or ANP service to review within ½ hour • Screen for Sepsis* • If no response to treatment within 1 hour, contact Registrar and/or ANP service • Consider continuous patient monitoring • Consider transfer to higher level of care
Emergency Response	**≥7**	**½ hourly**	NiC and Team / On-call Registrar Inform Team / On-call Consultant	• Registrar / Consultant / ANP service to review immediately • Continuous patient monitoring recommended • Plan to transfer to higher level of care • Activate Emergency Response System (as appropriate to hospital model)
	Score of 3 in any single parameter or **Score of 2 for HR ≤40**	**½ hourly** or **as indicated by patient condition**	NiC and Team / On-call SHO	• SHO or ANP service to review immediately • If no response to treatment or if still concerned, contact Registrar/Consultant • Consider activating Emergency Response System
	If response does not occur as per protocol the CNM/NiC should contact the Registrar or Consultant			

New in INEWS V2

Deferred escalation by an RGN

An RGN using their clinical judgement and working within their scope of professional practice may decide against immediate escalation…when they believe that immediate simple measures are likely to reduce the INEWS score over a short period of observation within or up to a maximum period of 30 minutes (Recommendation 11).

Deferred escalation should be followed by:

- Reassessment ≤30 minutes, escalating if no improvement
- Documentation of decision to defer escalation on the INEWS chart

Deferred Escalation (to be completed by Registered General Nurse (RGN))

Date/Time (use 24hr clock)	Rationale and Interventions	Review at 30 minutes	Nurse (Signature and NMBI PIN)
25 / 05 / 20 @ 0400	Imp: Decrease in SpO2 to 94% on 2L/min O2 via n/prongs, patient lying flat, stated they feel okay. Intervention: patient repositioned and n/prongs adjusted. Repeat observations and review decision at 30 minutes. NIC informed.	0430 hours: SpO2 back to 96% on 2 L/min O2, no need for escalation.	Nurse Brown (PIN 12345)
/ / @			
/ / @			
/ / @			

Text within sections above is provided as example only - please write over the watermark

ISBAR Communication Tool → **I**dentify **S**ituation **B**ackground **A**ssessment **R**ecommendation

INEWS Escalation & Response Protocol

	INEWS Score	Minimum Observation Frequency	Escalation	Response
Bedside Response	Healthcare worker / patient / family concern	As indicated by patient condition	Nurse at the bedside / Nurse in Charge (NiC)	• NiC to review if concern and escalate as appropriate
	0 – 1	**6 hourly** (first 24 hours following admission) **then 12 hourly minimum**	NiC	• NiC to review if new score 1
	2	**6 hourly**	NiC	• NiC to review
Urgent Response	For INEWS scores of 0 – 2 an Urgent Response (SHO or ANP Service) can be called if there is clinical concern			
	3	**4 hourly**	NiC and Team / On-call SHO	• SHO or ANP service to review within 1 hour
	4 - 6 THINK SEPSIS*	**1 hourly**	NiC and Team / On-call SHO	• SHO or ANP service to review within ½ hour • Screen for Sepsis* • If no response to treatment within 1 hour, contact Registrar and/or ANP service • Consider continuous patient monitoring • Consider transfer to higher level of care
Emergency Response	**≥7**	**½ hourly**	NiC and Team / On-call Registrar Inform Team / On-call Consultant	• Registrar / Consultant / ANP service to review immediately • Continuous patient monitoring recommended • Plan to transfer to higher level of care • Activate Emergency Response System (as appropriate to hospital model)
	Score of 3 in any single parameter or **Score of 2 for HR ≤40**	**½ hourly** or **as indicated by patient condition**	NiC and Team / On-call SHO	• SHO or ANP service to review immediately • If no response to treatment or if still concerned, contact Registrar/Consultant • Consider activating Emergency Response System

If response does not occur as per protocol the CNM/NiC should contact the Registrar or Consultant

Cycle of Clinical Futility

- A ‘cycle of clinical futility’ is when a patient is deteriorating and they are reviewed on a number of occasions but despite the patient not responding to interventions they are not escalated for senior medical review i.e. a lot of activity with no improvement - and even dis-improvement - in patient condition
- Hierarchical culture in hospitals can lead to reluctance of junior staff to escalate upwards to senior colleagues
- INEWS escalation and response protocol prompts escalation to Registrar or Consultant if patient does not respond to initial treatment

New in INEWS V2

Modified Escalation and Response Protocol

Recommendation 7: ***A patient's INEWS score or the INEWS physiological parameter ranges must not be altered.***

However, some patients' lived baseline observations will fall outside INEWS normal parameter ranges. To respond to these individuals' care needs INEWS V2 introduces the Modified Escalation and Response Protocol for use by a Consultant or Registrar once a patient has been admitted for 24 hours or longer ie has established a baseline observations trend.

New in INEWS V2

Modified INEWS Escalation and Response Protocol – minimum content

- Rationale for modification of escalation and response
- Timeframe for review of patient and modified response protocol (minimum 24 hourly review)
- Information about further action(s) and/or escalation.

(Note: For the majority of patients the standard Escalation and Response Protocol will be appropriate)

Modified INEWS Escalation and Response Protocol (to be completed by Consultant or Registrar only)
Not for use within first 24 hours of admission

	Date Year: 2020	Time (use 24hr clock)	Rationale and Instructions/Interventions	Next medical review	Doctor (Signature and MCRN)
Start	05 / 03	1800	Imp: Chest infection, admitted > 24 hours ago Stable with RR 20, SpO2 96%, O2 2L/min via nasal cannulae (INEWS score 3) Escalate if change in RR or increased O2 requirement to maintain SpO2 treatment target of ≥ 96%*	First thing tomorrow morning or earlier if patient condition deteriorates (increase in RR or if requires an increase in supplemental O2 to maintain target SpO2) or if clinical concern.	Dr. A, Medical Registrar MCRN 1234567
End	/				
Start	/				
End	06 / 03	1000			
Start	/				
End	/				
Start	06 / 03	1000	Reviewed. Discontinue O2. Seek review by Medical Registrar or Consultant if change in RR or if O2 required again.	24 hours or sooner if concern	Dr. A, Medical Registrar MCRN 1234567
End	07 / 03	1000			
Start	/				
End	/				

**Text within sections above is provided as example only - please write over the watermark*

Patient Improvement Programme

Example of the use of a Modified Escalation and Response Protocol

Sean was admitted 24 hours ago and his baseline observations trend is consistently outside normal parameters.

Sean responded to treatment and is stable. Baseline observations remain outside normal INEWS parameters. The Consultant or Registrar completes a modified INEWS escalation and response protocol and will review after 24 hours or sooner if Sean's condition changes or if there is clinical concern.

The Modified INEWS Escalation and Response Protocol is reviewed by the Registrar or Consultant every 24 hours or sooner if there is clinical concern to ensure that the patient's clinical condition is being managed appropriately.

Consultant or Registrar documents the rationale for the modification, timeframe for review of patient and modified response protocol (minimum every 24 hours), and information about further actions and/or escalation

Use ‘ISBAR’ to communicate

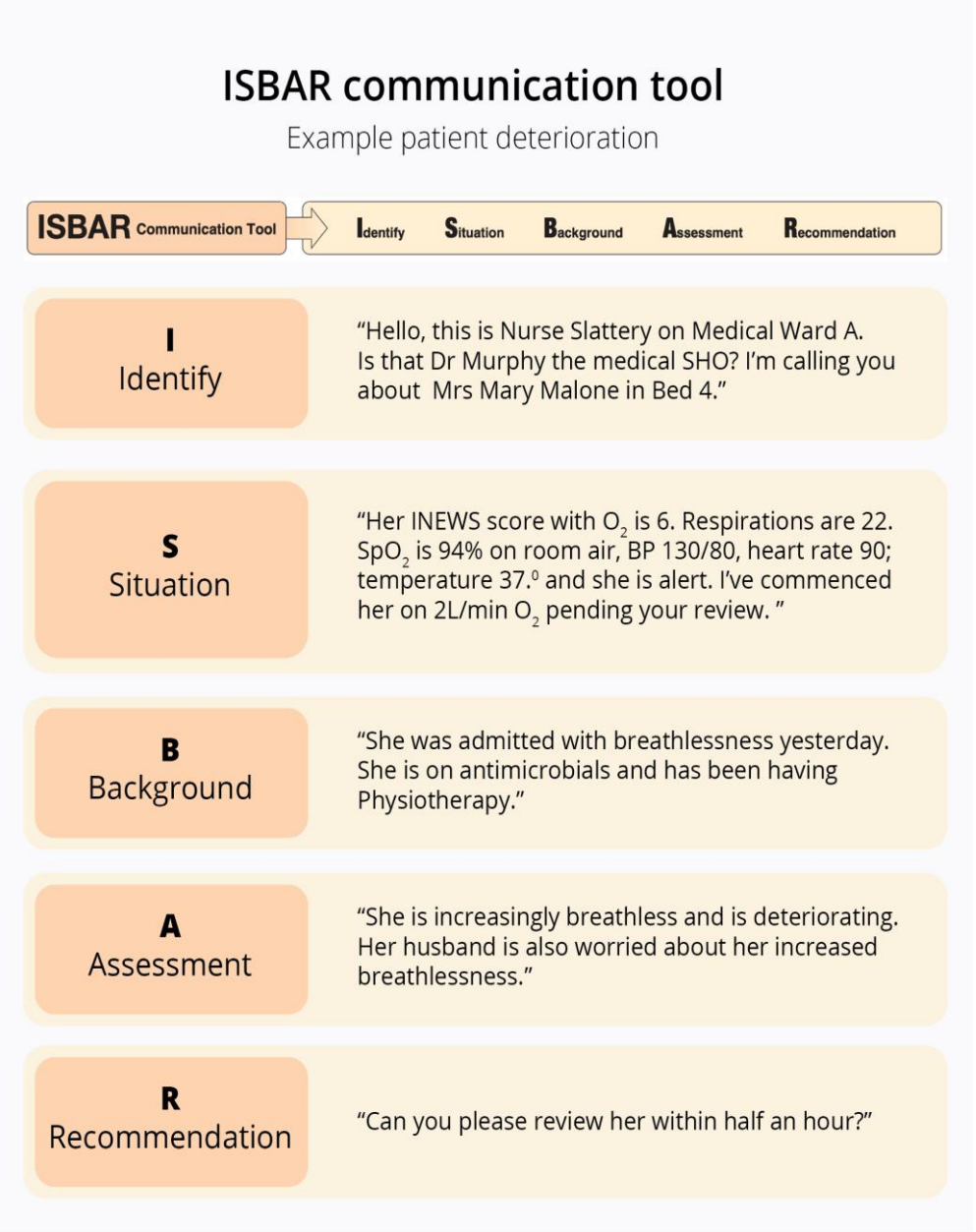
- **ISBAR** = **I**dentify, **S**ituation, **B**ackground, **A**ssessment and **R**ecommendation
- It provides a means of structured communication between healthcare professionals
- Enables clarification of what should be communicated between team members
- Promotes a shared language to improve patient safety

Deteriorating Patient Improvement Programme

Using ISBAR

Here is an example of how you might use ISBAR.

A patient was admitted to the Medical ward 24 hours ago with a presenting complaint of breathlessness. After measuring and recording observations, documenting them in the INEWS observation chart and repositioning the patient, the nurse on duty, Nurse Slattery noticed no improvement and so calls the SHO on duty, Dr. Murphy.



Summary

- Patient acuity must be clearly stated at the outset of the ISBAR conversation
- Patient monitoring must continue during escalation and review
- If response to escalation is not timely escalate to a more senior clinician
- RGN may defer escalation for up to 30 minutes if immediate measures are likely to improve a patient's condition
- Consultant or Registrar can document a Modified INEWS Escalation and Response Protocol for those small number of patients who's lived physiological observations baseline fall outside of INEWS normal parameter ranges

Deteriorating Patient Improvement Programme

INEWS in practice

Meet the patient: Mrs. Mary Malone

- 65 years old, admitted to a Medical ward 24 hours ago complaining of breathlessness
- Diagnosed with pneumonia, prescribed antimicrobial therapy and referred for physiotherapy
- Previous admissions for pneumonia. No significant co-morbidities

Deteriorating Patient Improvement Programme

Initial Assessment: 9:00AM

Mr Malone is concerned that his wife is more breathless

Nurse Slattery washes his hands, greets the patient, takes a brief history and notes that Mrs. Malone is breathless. He measures all the observations and documents them in the INEWS chart.

Deteriorating Patient Improvement Programme

Nurse Slattery's actions

Nurse Slattery repositions the patient. He discusses his decision to defer escalation with the Nurse in Charge and will reassess the patient in 30 minutes.

The decision for deferral is documented on the INEWS observation chart by Nurse Slattery.

Deferred Escalation (to be completed by Registered General Nurse (RGN))

Date/Time (use 24hr clock)	Rationale and Interventions	Review at 30 minutes	Nurse (Signature and NMBI PIN)
25 / 05 / 20 @ 0400	Imp: Decrease in SpO_2 to 94%, on 2L/min O_2 via n/prongs, patient lying flat, patient states they feel okay. Intervention: patient repositioned and n/prongs adjusted. Repeat observation and review decision at 30 minutes. NIC informed.*	0430 hours: SpO_2 back up to 96% on 2L/min O_2. No need for escalation.	Nurse Brown (PIN 12345)
/ / @			
/ / @			
/ / @			

*Text within sections above is provided as example only - please write over the watermark

ISBAR Communication Tool — **I**dentify **S**ituation **B**ackground **A**ssessment **R**ecommendation

Deteriorating Patient Improvement Programme

Rationale for not escalating immediately

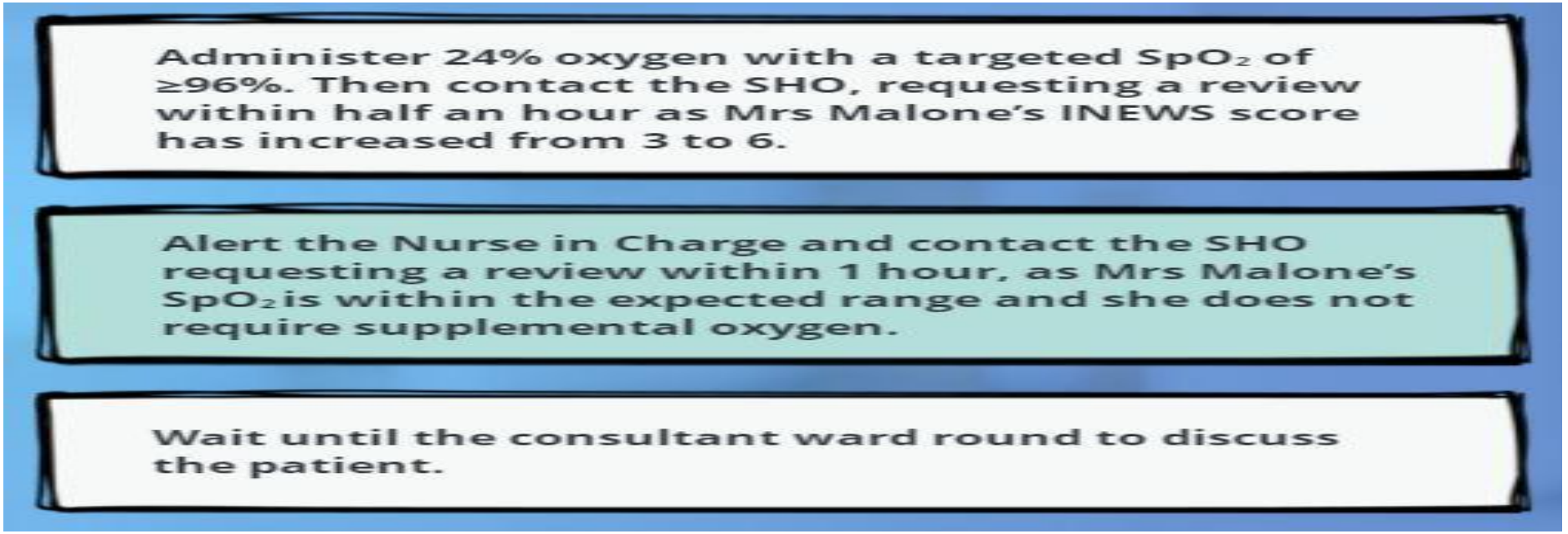
Nurse Slattery noticed the patient was lying in a semi-recumbent position on initial assessment. He expects that repositioning her may improve her breathlessness, avoid further deterioration and provide him with a more accurate assessment of her status.

He reassures the patient and will repeat her INEWS observations in 30 minutes. He advises Mrs. Malone to call him if she feels unwell.

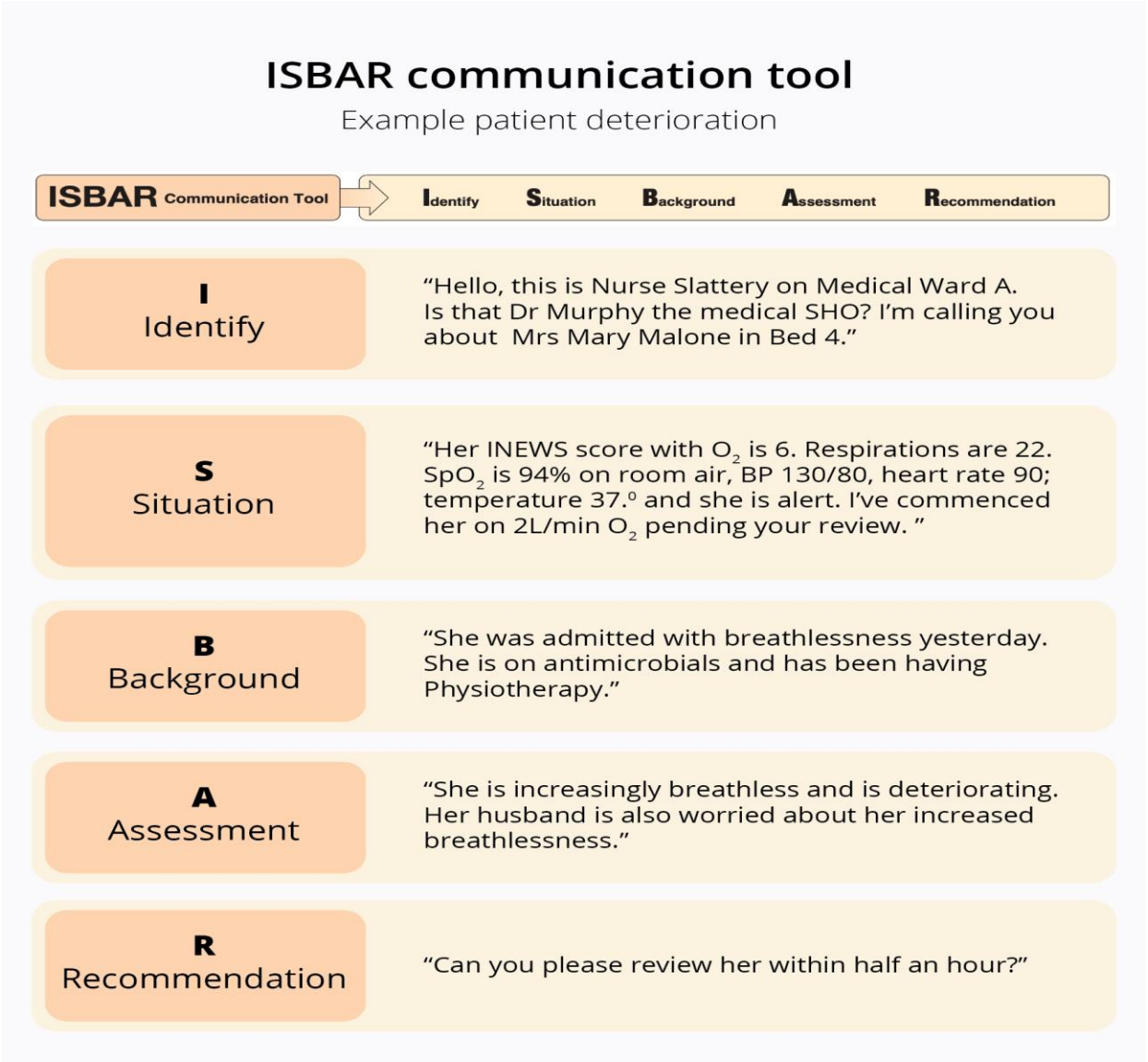
Next steps…

Nurse Slattery reassess the patient within 30 minutes

She remains breathless, her INEWS score remains 3…what should Nurse Slattery do next?



Nurse Slattery phones the SHO using ISBAR



Deteriorating Patient Improvement Programme

The SHO arrives: 10:00

Dr. Murphy, arrives within half an hour.

She washes her hands and reviews Mrs Malone, prescribes a nebuliser and orders a chest x-ray, ECG and blood and sputum samples for analysis. She considers sepsis, acute coronary syndrome, pulmonary embolus and heart failure as other possible causes of deterioration.

As recommended by the INEWS Escalation & Response protocol, Nurse Slattery will repeat the observations in 1 hour or sooner if the patient's condition deteriorates.

No response to treatment: 12 noon

Nurse Slattery repeats the observations hourly. The observations are unchanged after 2 hours with an INEWS score of 6. The patient's condition has not improved. Using his clinical judgement and in view of a persistent INEWS score of 6, Nurse Slattery discusses Mrs. Malone's condition with the SHO.

What should Dr. Murphy do next?

Escalate to the Registrar or Consultant for review.

Tell Nurse Slattery to repeat the observations in 1 hour, and that she will review the patient after that.

Rationale for Escalation to Registrar

- Mrs. Malone has not responded to initial treatment. Her vital signs and INEWS score remain unchanged despite interventions.
- In consultation with the nurse and using her own clinical judgement Dr. Murphy decides that the patient is unlikely to improve with current treatment regime.
- Dr. Murphy recognises the need for senior medical review and therefore escalates to Medical Registrar.
- Failure to escalate would have put Mrs. Malone at risk and could have negative consequences for patient outcomes.

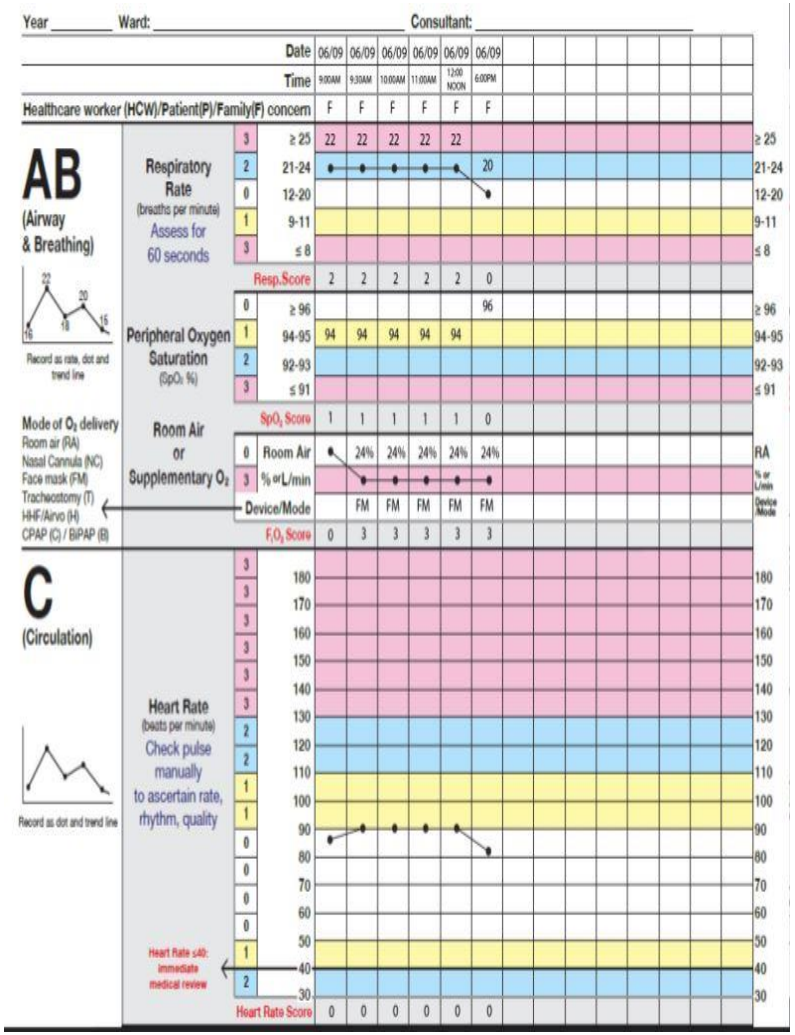
Modified Escalation and Response Protocol

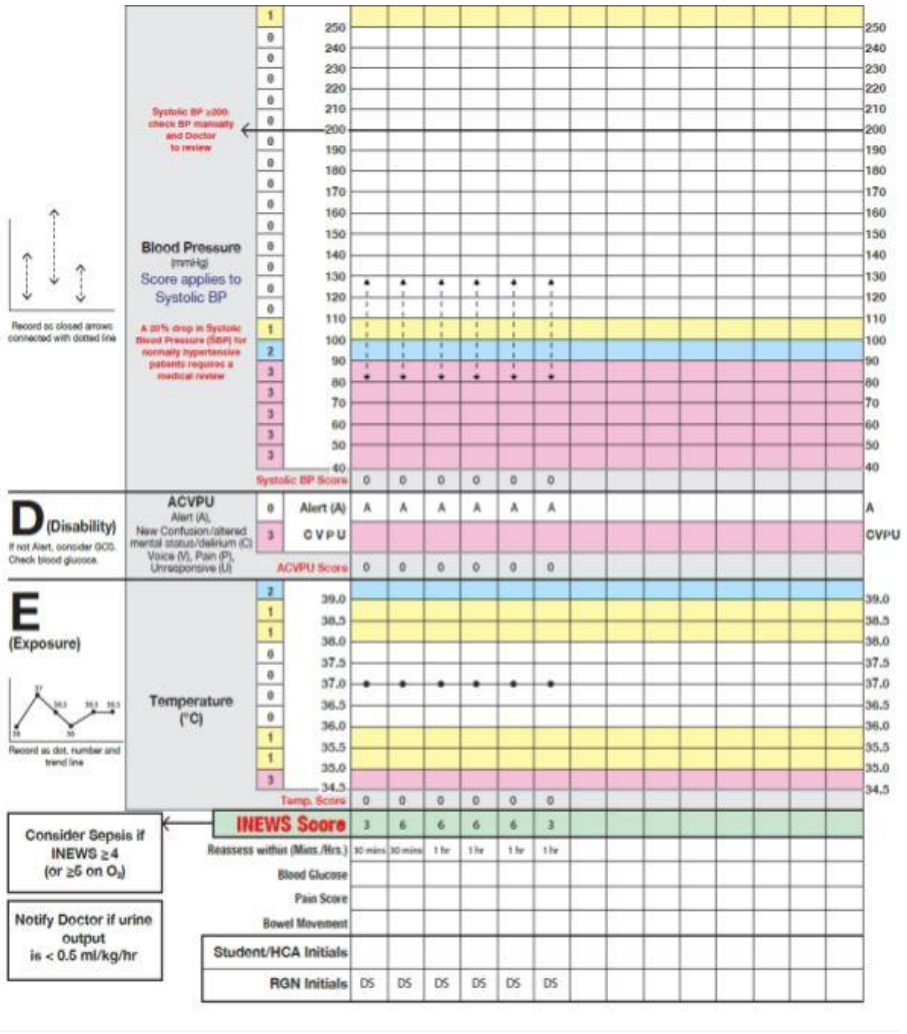
Mrs Malone received a Registrar review and responded to treatment. She is continuing to trigger escalation due to an INEWS score of 3 for O_2 therapy.

The Registrar now considers it appropriate to modify the INEWS Escalation and Response Protocol. The patient was admitted >24 hours ago.

Deteriorating Patient Improvement Programme

INEWS Patient Observation chart





Deteriorating Patient Improvement Programme

Example of a Modified Escalation and Response Protocol

Modified INEWS Escalation and Response Protocol (to be completed by Consultant or Registrar only)
Not for use within first 24 hours of admission

	Date Year: 2020	Time (use 24hr clock)	Rationale and Instructions/Interventions	Next medical review	Doctor (Signature and MCRN)
Start	05 / 03	1800	Imp: Chest infection, admitted > 24 hours ago Stable with RR 20, SpO2 96%, O2 2L/min via nasal cannulae (INEWS score 3) Escalate if change in RR or increased O2 requirement to maintain SpO2 treatment target of ≥ 96%*	First thing tomorrow morning or earlier if patient condition deteriorates (increase in RR or if requires an increase in supplemental O2 to maintain target SpO2) or if clinical concern.	Dr. A, Medical Registrar MCRN 1234567
End	/				
Start	/				
End	06 / 03	1000			
Start	/				
End	/				
Start	06 / 03	1000	Reviewed. Discontinue O2. Seek review by Medical Registrar or Consultant if change in RR or if O2 required again.	24 hours or sooner if concern	Dr. A, Medical Registrar MCRN 1234567
End	07 / 03	1000			
Start	/				
End	/				

*Text within sections above is provided as example only - please write over the watermark

Deteriorating Patient Improvement Programme

Modified Escalation and Response Protocol

Which of these statements in relation to the modified INEWS Escalation and Response protocol are correct?

- The rationale for modification of the INEWS Escalation and Response Protocol must be documented.
- Information about further action(s) and /or escalation must be detailed.
- The fact that the patient is on a modified protocol should be included in ward clinical handovers and safety huddles.
- There is no need to include a timeframe for review of the patient as the Modified INEWS Escalation and Response Protocol will be reviewed in 24 hours.
- Nurse Slattery should use the information contained in the modified protocol to guide his nursing care and documentation.
- While this modified INEWS Escalation & Response Protocol is still in place, there is no need to escalate the patient.

Deteriorating Patient Improvement Programme

Summary

- INEWS is used to aid clinical judgement and clinical decision-making. If worried about a patient, escalate care regardless of the INEWS score
- When escalating care, use the ISBAR tool.
- Adhere to the INEWS Escalation & Response Protocol
- A Registered General Nurse may defer escalation for a short period if immediate simple measures are likely to resolve patient symptoms
- A Consultant or Registrar may decide to document a modified INEWS Escalation & Response Protocol

Extend My Learning

Useful resources and additional reading to help you apply what you have learned to your practice

NCEC NCG No. 1 Irish National Early Warning System (INEWS) 2020 available at :
https://www.gov.ie/en/collection/c9fa9a-national-clinical-guidelines/?referrer=/national-patient-safety-office/ncec/national-clinical-guidelines/#national-early-warning-score-news

NCEC NCG No. 4 Irish Maternity Early Warning System (IMEWS) V2 available at:
https://www.gov.ie/en/collection/517f60-irish-maternity-early-warning-system-imews-version-2/

NCEC NCG No. 6 Sepsis Management 2020 available at:
https://www.gov.ie/en/collection/c9fa9a-national-clinical-guidelines/?referrer=/national-patient-safety-office/ncec/national-clinical-guidelines/#sepsis-management

NCEC NCG No. 11 Communication (Clinical Handover) in Acute and Children's Hospital Services available at:
https://www.gov.ie/en/collection/006e63-clinical-handover-in-acute-and-childrens-hospital-services/

NCEC NCG No. 12 Paediatric Early Warning System (PEWS) available at:
https://www.gov.ie/en/collection/f14e5c-paediatric-early-warning-system-pews/

NCEC NCG No. 18 Emergency Medicine Early Warning System (EMEWS) available at:
https://www.gov.ie/en/collection/bd79b1-emergency-medicine-early-warning-system-emews/

Additional reading

INEWS Systematic review of the literature (2019) HRB- CICER
https://assets.gov.ie/87924/6c2bcd02-9abc-4a29-b0dc-033423a36e81.pdf

Nurse worry/concern

- Douw, G., van Zanten, A.R., van der Hoeven, J.G. and Schoonhoven, L., 2016. Nurses worry as predictor of deteriorating surgical ward patients: a prospective cohort study of the Dutch-Early-Nurse-Worry-Indicator-Score. International journal of nursing studies, 59, pp.134-140.
- Romero-Brufau, S., Gaines, K., Nicolas, C.T., Johnson, M.G., Hickman, J. and Huddleston, J.M., 2019. The fifth vital sign? Nurse worry predicts inpatient deterioration within 24 hours. JAMIA Open.

Additional reading

Nursing Times series of six articles on **Respiratory Rate**:

- Kelly C (2018) Respiratory rate 1: why accurate measurement and recording are crucial. *Nursing Times* **114:** 4, 23-24.
- Hartley, J. (2018) Respiratory rate 2: the anatomy and physiology of breathing. *Nursing Times [Online]* **104**;6, 43-44.
- Wheatley, I. (2018) Respiratory rate 3: how to take an accurate measurement. *Nursing Times [Online]* **114;** 7, 21-22
- Wheatley, I. (2018) Respiratory rate 4: breathing rhythm and chest movement. *Nursing Times [Online]* **114**; 9, 49-50
- Wheatley, I. (2018) Respiratory rate 5: using this vital sign to detect deterioration. *Nursing Times [Online]* **114**; 10, 45-46
- Dix, A. (2018) Respiratory rate 6: the benefits of continuous monitoring. *Nursing Times [Online]* **114**; 11, 36-37

Additional reading

Quality Improvement & Patient Safety

- Brady, P.W., Muething, S., Kotagal, U., Ashby, M., Gallagher, R., Hall, D., Goodfriend, M., White, C., Bracke, T.M., DeCastro, V. and Geiser, M., 2013. Improving situation awareness to reduce unrecognized clinical deterioration and serious safety events. Pediatrics, 131(1), pp.e298-e308.
- Fitzsimons, J. and Pentony, M., 2019. Paediatric Early Warning Systems in 2019: What We Know and What We've Yet to Learn. Current Treatment Options in Pediatrics, 5(4), pp.315-325.

Oxygen administration

- Irish Guidelines on the Administration of Oxygen Therapy in the Acute Clinical Setting in Adults 2017

Situation Awareness

- Team STEPPS: https://www.ahrq.gov/teamstepps/index.html

INEWS Resources

Education & Training Resources include

- INEWS National Clinical Guideline https://www.gov.ie/en/collection/cc5faa-national-early-warning-score-news/
- HRB-CICER systematic review of the literature for INEWS V2 https://assets.gov.ie/87924/6c2bcd02-9abc-4a29-b0dc-033423a36e81.pdf
- INEWS e-learning programme www.hseland.ie (located within the Clinical Skills catalogue)
- The revised INEWS patient observation chart https://www.hse.ie/eng/about/who/cspd/ncps/deteriorating-patient-improvement-programme/inews-patient-observation-chart.pdf
- Guidance on completing the INEWS patient observation chart https://www.hse.ie/eng/about/who/cspd/ncps/deteriorating-patient-improvement-programme/how-to-use-the-inews-patient-observation-chart.pdf
- INEWS/COMPASS User Manual https://www.hse.ie/eng/about/who/cspd/deteriorating-patient-improvement-programme/inews-education-compress-training-manual.pdf
- QI Tools and resources
- Facilitators slide-deck for local use
- The DPIP Team dpip.1@hse.ie or
  - Avilene.casey1@hse.ie National Lead DPIP
  - Miriam.bell@hse.ie Project Lead Guideline Revision
  - serena.Brophy@hse.ie Project Lead Service Improvement

Deteriorating Patient Improvement Programme