



Sengkang Health  
SingHealth

***Nursing Department***

***Nursing Education and Development***

***Early Warning:***

***Recognition & Rescue***



## Introduction

The early warning system is a rescue strategy to aid in identifying patients who are deteriorating clinically and then promptly intervene to prevent further deterioration. In some contexts, the strategy to rescue is termed as rapid respond. Relating to clinical practice, nurses remain as the main care providers by scope of duty; also by proximity, nurses spend most of their work time centred on patients. Hence, nurses are usually the first or can be the first to identify a deteriorating patient.

To identify a deteriorating patient, nurses must assess and relate findings to derive a need to inform or escalate the situation to the medical team for prompt interventions. The skills that are required in early warning recognition includes:

1. Vital signs assessment – accuracy
2. Physical assessment – analyse & relate
3. Communication – SBAR
4. Nurse initiated interventions – RESCUE!

## Recommended Training Components

|   | <b>Components</b>                                 | <b>Target Providers</b> |
|---|---|-------------------------|
| 1 | Clinical assessments: Vital Signs                 | RNs & ENs               |
| 2 | Physical Assessment: Lung, heart and bowel sounds | RNs                     |
| 3 | Oxygen therapy & Broncho-dilation therapy         | RNs & ENs               |
| 4 | IV Therapy  | RNs                     |
| 5 | Hypo/Hyperglycaemia management                    | RNs                     |

## Early Warning

In the past, nurses have relied on a single parameter when making decision or reporting a situation. Over years, it is known that a single parameter can be unreliable as it provide vague clue as to what might be the cause. For example, a heart rate of 130 per minute could indicate clinical states of hypovolaemia, hypoxemia, etc.

When a set of parameters is correlated, the list of possible causes is narrowed and diagnosis becomes more accurate and treatment is correctly prescribed and is effective. Example, a heart rate of 130 per minute **with** blood pressure reading of 80/50mmHg immediately rule out hypoxemia!

This is not all. The medical team receiving information from the nursing team must also have the patient's background in order to establish a link from the current clinical problem to the chief diagnosis. Is this a new problem or an old recurring problem in which an existing treatment plan is underway?

The medical team also need to know the severity of the alteration and this is conveyed accurately through the nurses' assessment of the patient. Example, the nurse reports a case of desaturation. The urgency of desaturation can be gauge through the change in status over a time period:

- Patient A has a SpO<sub>2</sub> reading of 98% and is assessed to have SpO<sub>2</sub> reading of 94% 8 hours later.
- Patient B has a SpO<sub>2</sub> reading of 98% that declines to SpO<sub>2</sub> 88% over a span of 20 minutes.

The above illustration with a time factor clearly indicate the urgency to attend to Patient B as compared to Patient A. While not all conditions evolve quickly over short period of time; a critical value can be relevant for reporting too.

The nurse then provides a recommendation to act upon while waiting for a medical staff to arrive at the ward.

Hence, framing all above information into a conversation, the SBAR is a recommended communication tool in this context. Before getting to SBAR, it is important to review the common situations and identify possible triggers behind these deteriorations:

- Acute desaturation
  - Shortness of breaths
  - Compromised airway
  - Pulmonary embolism
- Sudden loss of consciousness or altered conscious level
  - Hypoglycaemic / hyperglycaemic
  - Stroke
  - Seizures
- Acute hypotension
  - Loss of fluid volume
  - Bleeding
  - Sepsis
- Pain
  - Chest pain
  - Unrelieved neurogenic pain

The above are just some examples. There are other triggers relevant to specialized areas such as oncology, gerontology, critical care and emergency.

## Vital Signs Assessment

The early warning framework uses a scoring system to assist with recognition. Based on the vital signs assessment, the respective score can be added to indicate state of urgency.

Example: Heart rate of 130 per minute with BP or 80 / 50 mmHg is a score of 2 + 3 = 5

With an established protocol, nurses shall act according to the protocol state for the specific score. These may be stepping up monitoring every 1 to 2 hourly, inform medical team or inform consultant.

The following vital signs appears on the existing modified early warning score (MEWS) framework:

- Respiratory Rate
- Oxygen Saturation (SpO<sub>2</sub>) – score include the use of supplemental oxygen
- Temperature
- Systolic Blood Pressure
- Heart Rate
- Level of Consciousness

**National Early Warning Score (NEWS)\***

| PHYSIOLOGICAL PARAMETERS | 3     | 2        | 1           | 0           | 1           | 2         | 3          |
|--------------------------|-------|----------|-------------|-------------|-------------|-----------|------------|
| Respiration Rate         | ≤8    |          | 9 - 11      | 12 - 20     |             | 21 - 24   | ≥25        |
| Oxygen Saturations       | ≤91   | 92 - 93  | 94 - 95     | ≥96         |             |           |            |
| Any Supplemental Oxygen  |       | Yes      |             | No          |             |           |            |
| Temperature              | ≤35.0 |          | 35.1 - 36.0 | 36.1 - 38.0 | 38.1 - 39.0 | ≥39.1     |            |
| Systolic BP              | ≤90   | 91 - 100 | 101 - 110   | 111 - 219   |             |           | ≥220       |
| Heart Rate               | ≤40   |          | 41 - 50     | 51 - 90     | 91 - 110    | 111 - 130 | ≥131       |
| Level of Consciousness   |       |          |             | A           |             |           | V, P, or U |

\*AVPU – alert, voice, pain, unresponsive

### Respiratory Rate

Most MEWS charts begin with the Respiratory Rate, indicating its importance and reliable in detecting deterioration!

Why is Respiratory Rate Important??

Respiratory rate is a sensitive indicator of inadequate oxygen delivery to the tissues and therefore a marker of a deteriorating patient. An increase in respiratory rate can either reflect a drop in arterial blood oxygen saturation level or compensation for the presence of metabolic acidosis.

### Oxygen Saturation

The SpO<sub>2</sub> obtain its measurement from peripheral blood capillary. It is estimation as compared to the lab sample measurement – SaO<sub>2</sub>. However, SpO<sub>2</sub> measurement is an easy process and it provides estimation of the values and could guide clinical interventions.

### Temperature

The temperature is a parameter that is correlated with other parameters for accurate diagnosis. With increased occurrences of sepsis, temperature screening becomes necessary in early detection for early sepsis resuscitation.

### Systolic Blood Pressure

A decrease in blood pressure could mean a decrease in cardiac output that can result in reduction in oxygen delivery to the tissues. Generally, the definition of hypotension in adults is:

- Systolic pressure of less than 100 mmHg
- A drop of 20% or more from the baseline SBP

The decrease in blood pressure can be due to loss of blood volume or vasodilatation in the case of sepsis.

An increase in heart rate reflects a decrease in stroke volume (decrease in cardiac output). Very often, the response to increase heart rate is a natural body's protective feedback mechanism to compensate.

Hence, the pulse and blood pressure values are important markers of where there is adequate cardiac output and oxygen delivery to the tissues.

### Heart Rate

Heart rate measurement is commonly read off the monitor. Abnormal readings prompt nurses to manually check the patient's pulse. Manual palpation on pulse points is a more accurate way of obtaining pulse readings. As the nurse palpates, more valuable information is obtained, such as:

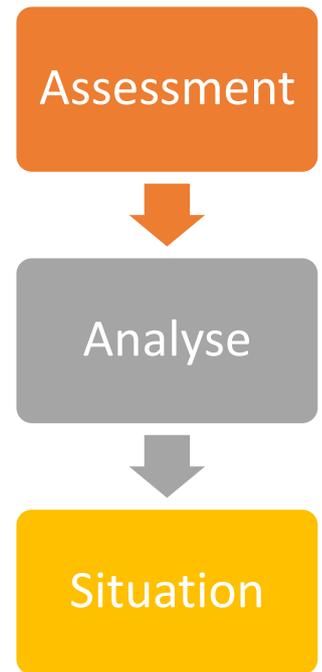
- Pulse intensity (strength) – weak, tready, strong or bounding?
- Skin texture – cold, clammy, warm or dry?

The pulse is taken for a full minute.

*See also explanation in Systolic Blood Pressure. \**

### Level of Consciousness

Depressed level of consciousness is an indicator of systemic insults or increased in intracranial pressure. Causes of depressed consciousness level could be due to inadequate oxygenation and Inadequate Substrate Delivery for Metabolism. Neurons use glucose as their substrate for energy production. Therefore hypoglycaemia can cause confusion or depressed level of consciousness.



## Physical Assessment

Findings from physical assessment are correlated with vital signs in deriving differential diagnoses. In problem recognition and rescue, the medical team often performs physical assessment after the initial conveying of vital assessments. There is a time lapse between conveying of vital signs and waiting for medical team's review. Much could be done during this time if assessment findings can be obtained and conveyed together with the vital signs. The medical team could prescribe treatment over the phone. Hence, physical assessment is an enabling clinical skill that all nurses should cultivate performing.

### Lung Sounds

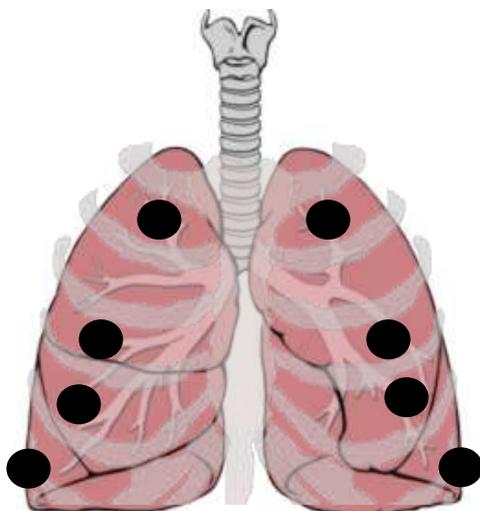
The lungs sounds are auscultated over the anterior and posterior chest. In obtaining a quick assessment, auscultation points can be limited to the anterior chest to identify adventitious sounds. Lung sounds can be described as wet, dry, noisy, low pitched, high pitched, musical, during expiratory phase and/or during inspiratory phase.

Some common findings are given in the following table:

| Lung Sounds                 | Description                 | Phase       | Areas                           |
|-----------------------------|-----------------------------|-------------|---------------------------------|
| 1. Crackles (Crepes, Rales) | Wet, bubbly                 | Inspiratory | Basal, middle                   |
| 2. Rhonchi                  | Wet, snorting, low pitched  | Inspiratory | Midline, Sternal, Large airways |
| 3. Wheeze                   | Musical, Low – high Pitched | Expiratory  | All lung fields                 |
| 4. Stridor                  | Musical, Med – high pitched | Inspiratory | Midline, Sternal, Large airways |

Auscultate over the lung fields using the stethoscope diaphragm. Listen to at least 5 full inspiratory-expiratory cycle before moving on to the next auscultation point. While listening, identify the following:

- The phase when it is occurring – inspiratory? Or expiratory?
- Equal air entry – compare side to side, listen for equal loudness
- Identify isolated sounds – identify the lung lobe, where sound is occurring
- Lung sounds – name / describe the sound heard

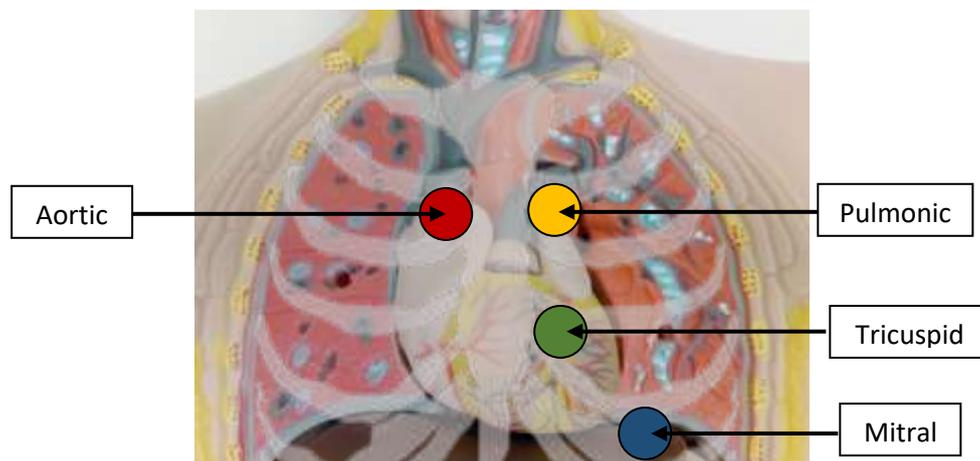


## Heart Sounds

There are 4 cardinal cardiac auscultation points – Aortic, Pulmonic, Tricuspid and Mitral areas. When listening over these areas, sounds generated by the activities of the heart valves can be heard. Based on the type and quality of the sounds, various cardiac conditions or diagnoses can be derived. Cardiac auscultation is correlated with the patient’s pulse in order to match heart sounds with the cardiac cycle.

Common heart sounds are described in the following table:

| Heart Sounds           | Valves Activity   | Phase            | Areas (louder at)          |
|------------------------|---|------------------|----------------------------|
| 1. S1 (normal)         | Closure of Tricuspid & Mitral                               | Systole          | Apex                       |
| 2. S2 (normal)         | Closure of Aortic & Pulmonic                                | Diastole         | Cardiac Base               |
| 3. S3                  | Ventricular wall vibration from rapid ventricular filling   | Early Diastole   | Right ventricle, Tricuspid |
| 4. S4                  | Atrial contraction kick / output to non-compliant ventricle | End Diastole     | Left ventricle, Apex       |
| 5. Murmur - Mitral     | Mitral prolapse (mitral valve regurgitation)                | Systole          | Mitral and Axilla          |
| 6. Murmur - Mitral     | Mitral stenosis   | Diastole         | Mitral and Axilla          |
| 7. Murmur - Aortic     | Aortic insufficiency  | Early Diastole   | Aortic and Apex            |
| 8. Murmur - Aortic     | Aortic stenosis   | Systole          | Aortic                     |
| 9. Murmur - Tricuspid  | Tricuspid prolapse (tricuspid valve regurgitation)          | Systole          | Tricuspid                  |
| 10. Murmur - Tricuspid | Tricuspid Stenosis  | Diastole         | Tricuspid                  |
| 11. Murmur - Pulmonic  | Pulmonic prolapse & stenosis (uncommon)                     | Diastole/Systole | Pulmonic                   |



## Neuro Assessment

The neuro assessment is performed when there is identified change in patient’s conscious level. The common tools used for neuro assessment is the Glasgow’s coma scale (GCS). The GCS has 3 components

- Best eye (Pupillary assessment)
- Best verbal
- Best motor response (Motor strength of the limbs)

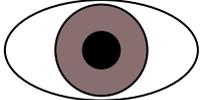
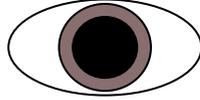
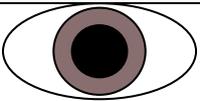
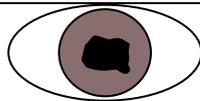
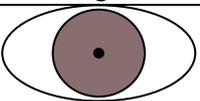
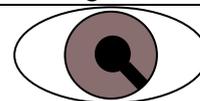
1. Best eye response

The pupil size is obtained through inspection with good ambience lighting (not too bright; pre-shine).

|  |                 |   |
|--|-----------------|---|
| Eye opening<br><br><i>If eye(s) are closed due to swelling, chart "C" in the box</i> | (4) Spontaneous | Open eyes spontaneously                             |
|  | (3) To speech   | Call name, light touch                              |
|  | (2) To pain     | Open eyes to painful stimulus (Peripheral Stimulus) |
|  | (1) None        | Does not open eyes to pain stimulus                 |
|  | (C)             | Closed – pathologic, swelling                       |

Pupil reactivity is assessed with a light source moving from outer to inner eye cantus.

Patient with cataracts is assessed using high intensity light (LED light) to overcome partially opaque lens.

|   |  |   |  |
|---|--|---|--|
|                | Normal pupil<br>Range (2 to 5mm)                                     |                 | Severe anoxia<br>Brain injury, death                                 |
| <br>Small     | Elderly<br>Mitotic eye drop  | <br>Ovoid      | Early sign of transtentorial herniation<br>Intracranial hypertension |
| <br>Large    | Drugs (cocaine)<br>Brain injury, tumor, stroke<br>Mydriatic eye drop | <br>Irregular | Traumatic orbital injuries   |
| <br>Pinpoint | Organophosphate poisoning<br>Opiate overdose                         | <br>Keyhole   | Patients with iridectomy done  |

2. Best Verbal Response

|   |                             |  |
|---|-----------------------------|--|
| Verbal response<br><br><i>For endotracheal or tracheostomy tube, chart "T" in the box</i> | (5) Orientated              | Content of speech is appropriate (Ask people, place and time)                      |
|   | (4) Confused                | Respond usually in sentences and answers are incorrect but related to the question |
|   | (3) Inappropriate words     | Replies in words and answers are not related to questions                          |
|   | (2) Incomprehensible sounds | Moans, groans or screams   |
|   | (1) None                    | No response  |
|   | (T) Tube                    | Endotracheal or Tracheostomy Tube In-situ  |

### 3. Best Motor Response

|   |                       |  |
|---|-----------------------|--|
| <b>Motor response</b><br><br><b>Best arm movement</b> | (6) Obeys commands    | Patient does simple things as told           |
|   | (5) Localizes pain    | Purposeful movement towards painful stimuli. |
|   | (4) Flexion to pain   | Pulls part of the body away when pinched     |
|   | (3) Abnormal flexion  | Decorticate position                         |
|   | (2) Extension to pain | Decerebrate position                         |
|   | (1) None              | No response, lies flaccid                    |

Applying pain stimulus (for no longer than 30 seconds) to elicit a response:

**Central stimulus** – to test localizing pain and other levels (M1 – M5)

- Trapezius Pinch / Squeeze
- Sternal rub (least preferred)

**Peripheral stimulus** – when central stimulus fails to elicit a response or when testing motor strength (of 2/5 and lower)

- Nail beds – use a pen to apply pressure downwards, do not scrape on nails

For all pain stimulus application, rotate sites to prevent bruising or haematoma

#### Assessing Motor Strength

Apply resistance to patient movement on all limbs. Instruct patient to exert against applied resistance & score according to scoring criteria.

| Grade      | Description   |
|------------|---|
| <b>0/5</b> | No muscle movement  |
| <b>1/5</b> | Visible muscle movement, but no movement at joint         |
| <b>2/5</b> | Movement at the joint but not against gravity             |
| <b>3/5</b> | Movement against gravity but not against added resistance |
| <b>4/5</b> | Movement against resistance, but weak                     |
| <b>5/5</b> | Normal strength   |

Record right and left limbs separately if the score is different.

#### Other Assessments

Depending on the discipline and case concerned, other form of assessments required to identify cause of acute deterioration. Here are some examples:

- Surgical cases – wounds, dressing, drainage, nasogastric tube suction, intake/output records, analgesia.
- Diabetic cases – blood sugar monitoring protocol and records, use of oral hypoglycemic agents, effective insulin administration.
- Orthopedic cases – mobility, use of DVT prophylaxis, wound, dressing, and drainage.

## Decision Making

A clinical response chart is adopted to guide ground staff on the actions to be taken upon scoring of deteriorating patients. The RNs or ENs should adopt appropriate steps according to assessed risk level. The steps are stated in the following table:

| Risk Level           | Aggregate NEWScore                           | Frequency of Monitoring           | NURSES Clinical Response   | DOCTORS Clinical Response  |
|----------------------|--|-----------------------------------|--|--|
| Low Clinical Risk    | 0  | 4 hourly                          | <ul style="list-style-type: none"> <li>Continue NEWS monitoring with every set of observations.</li> </ul>   | <ul style="list-style-type: none"> <li>HO to respond when alerted by nurses</li> </ul>   |
|                      | 1-4  | 4 hourly                          | <ul style="list-style-type: none"> <li>Re-check and document observations within 15 min.</li> <li>Inform Staff Nurse In- Charge who must assess the patient.</li> <li>Staff Nurse In-Charge to inform Resident Nurse / medical team caring for patient using SBAR format.</li> </ul> | <ul style="list-style-type: none"> <li>HO to respond when alerted by nurses (e.g. septic work-up if T <math>\geq</math> 38.3°C, provide supplemental O<sub>2</sub>, etc.)</li> </ul>   |
| Medium Clinical Risk | Score of 3 in any one Parameter<br>OR<br>5-6 | 2 hourly                          | <ul style="list-style-type: none"> <li>Re-check and document observations within 15 min.</li> <li>Registered nurse to urgently inform medical team caring for patient using SBAR format.</li> </ul>  | <ul style="list-style-type: none"> <li>Doctor (at least MO level) to urgently assess patient within 30 min upon alert by nurses.</li> </ul>  |
| High Clinical Risk   | 7 or more                                    | 1 Hourly Or Continuous Monitoring | <ul style="list-style-type: none"> <li>Re-check and document observations within 15 min.</li> <li>Registered nurse to immediately inform medical team caring for patient using SBAR format.</li> </ul>   | <ul style="list-style-type: none"> <li>Doctor (at least Registrar level) to immediately assess patient within 15 min and decide if escalation to the next level of care is necessary.</li> <li>Case to be handed over to the Doctor-In-Charge for the next shift.</li> </ul> |

## Communication

### iSBAR – Introduction – Situation – Background – Assessment – Recommendation

The SBAR is an effective tool to assist with communication in stressful situations.

Most institutions has adopted this framework; some re-termed it to **iSBAR** where the “I” stands for introduction. However, its effective use is depended on how concise the conversion is kept to.

Most nurses encounter difficulty keeping to short segments of information as there is so much to convey to the medical team. Nurses often struggle with the order of information priority and this is often caused by the lack of careful analysis of assessment findings.

Typically, the nurse in charge of the patient makes the call to inform medical team of the emerging problem. However, initial assessment of the patient should be obtained and be ready for the problem reporting. In order to convey sense of urgency, the situation is framed using no more than 3 words and no part of assessment is presented during the situation part. The following table provides some examples:

| Cases  | Instead of this ...                                      | Say this ...                          |
|--------|--|---------------------------------------|
| Airway | Patient is breathing at 35/min and his saturation is 82% | Patient has <b>acute desaturation</b> |
| Low BP | Patient BP is 80/40                                      | Patient <b>turns hypotensive</b>      |
| Drowsy | Patient is getting drowsy, GCS is 12                     | Patient <b>turns unconscious</b>      |

**S**ituation

**B**ackground

**A**ssessment

**R**ecommendation

Dr. Ho, Patient Mdm. Chan is hypotensive. She has DM and has right BKA done yesterday. Current BP is 82/58mmHg. May I start IV Saline at 120ml/hr while you come to see her please?



## Nurse initiated interventions – RESCUE!

Nurses are able and are empowered to carry out interim interventions to alleviate emerging clinical problem while waiting for medical help. Examples of nurse initiated interventions are:

- Therapeutic positioning
- Oxygen therapy
- Initiating intravenous access
- Administer existing prescribed medication (relevant to treat)

### Therapeutic Positions

Use positioning in the interim to relieve current symptoms or complications. Such as:

- High fowler's position to relieve shortness of breaths.
- Elevate lower limbs to displace blood volume to vital organs in the case of suspected blood loss or hypotension.
- Elevate head of bed at 30 degrees for suspected stroke or unconsciousness (with normal BP) to prevent aspiration.
- Trendelenburg position to displace blood volume to provide cerebral perfusion in established bleeding.

## Oxygen Therapy

The nurse can initiate oxygen therapy, however, the intervention needs to be informed to the medical team for formal prescription on record. Upon recognizing a deteriorating case, oxygen must be given in high concentration to sustain oxygen delivery, enhancing oxygenation to potentially failing organs. Oxygen is given even when the SpO<sub>2</sub> is of normal reading.

Oxygen delivery devices and their performance information are given in the following table:

| <b>Device</b>               | <b>Flow and FiO<sub>2</sub></b>                              | <b>Advantages</b>                                      | <b>Disadvantages</b>   | <b>Indications</b>  |
|-----------------------------|--|--|--|---|
| <b>Nasal Cannula</b>        | - 1 – 6 LPM<br>- FiO <sub>2</sub> 0.24-0.44<br>(24% - 44%)   | - Allows talking or eating<br>- Compliance             | - Imprecise FiO <sub>2</sub><br>- Max O <sub>2</sub> 44%                                 | - Mildly hypoxic patients<br>- History of retaining CO <sub>2</sub> |
| <b>Simple mask *</b>        | - 5 – 10 LPM<br>- FiO <sub>2</sub> 0.35-0.50<br>(35% - 50%)  | - Provides higher FiO <sub>2</sub> than nasal cannula  | - CO <sub>2</sub> rebreathing if flow is low<br>- FiO <sub>2</sub> Variable              | - Moderately hypoxic patients not known to have COLD                |
| <b>Venturi mask</b>         | - Up to 6 LPM<br>- FiO <sub>2</sub> 0.24-0.50<br>(24% - 50%) | - Precise FiO <sub>2</sub><br>- Max O <sub>2</sub> 50% | - Risk of error in application*<br>- CO <sub>2</sub> rebreathing if flow rate inadequate | - Controlled oxygen therapy, e.g. for Type II failure from COLD     |
| <b>Non-rebreathing mask</b> | - 10 – 15 LPM<br>- FiO <sub>2</sub> 0.50-0.80<br>(50% - 80%) | - Max O <sub>2</sub> 80%                               | - Uncomfortable<br>- Claustrophobic  | - High FiO <sub>2</sub> necessary to correct hypoxia                |

\* Simple face mask may not be available in some areas / units.

## Initiate an IV Access

Most in-patient will have an IV cannula inserted during their stay. When given a chance, the IV access should be checked for its patency. In the state of deterioration, the common anticipation is that the medical team will prescribe fast acting drugs for timely relieve of changing condition.

Hence, nurses should expect intravenous route medication to be given.

The nurse may also initiate to prime and put up a unit of Normal Saline infusion that runs for about 6 hours in rate. The drip not only maintains hydration, it keeps the vein open as well.

## Administer Existing Prescribed Medication

It is always helpful to look in to the list of medications to see if any already prescribed drugs can be given to alleviate the current episode. Should a particular drug is found to be useful for the situation, verify out-of-frequency dose with the medical team before giving to the patient.



## Summary

NEWS, an early warning and rescue tool, is a structured, Step-by-step approach to assessment of patients, integrated with score-directed actions and reporting of clinically deteriorated patients. When followed, nurses can assist in timely management of patients and prevent worsening state.

Accurate use of this tool requires accuracy in assessment as the obtained assessment findings will affect scoring. Also, the user needs to communicate the findings to allow prescribing of appropriate treatment. Hence, NEWS is not an independent tool. It complements with other clinical skillset.

## Early Warning Recognition & Rescue

### Scenario 1

Mr. Goh Meng Hock, age 68 year-old is diagnosed COPD and is currently admitted for bronchitis. Today is the day 3 of his admission. The medical and nursing teams are planning for his discharge target for 2 days later. He is also hypertensive and is on several medications.

He is prescribed the following medications:

1. IV Augmentin 1.2gm BD
2. PO Paracetamol 1gm TDS PRN
3. NEB Ventolin/Atrovent/Normal Saline 1:1:2, 6 hourly
4. PO Senokot 2 tabs ON PRN
5. PO Atenolol 50mg OM
6. PO Enalapril 5mg OM
7. PO Aspirin 100mg OM
8. PO Lasix 40mg BD

His vital signs by trend:

|                         | 8 am   | 12 noon | 2 pm (Current) |
|-------------------------|--------|---------|----------------|
| Respiration rate (/min) | 24     | 28      | 32             |
| SpO <sub>2</sub> (%)    | 93     | 94      | 82             |
| Heart Rate (/min)       | 98     | 105     | 133            |
| Blood pressure (mmHg)   | 140/80 | 158/82  | 160/98         |
| Pain Score (/10)        | 0      | 1       | 1              |
| Conscious level (AVPU)* | A      | A       | V              |

\*A-Alert, V-Voice, P-Pain, U-Unconscious

Physical assessment at 8 am:

Lung sounds: Bilateral Wheezes and Crackles, middle and lower lobes

Heart sounds: S1S2, no murmur

Bowel sounds: Active

## Scenario 2

Mr. Mohammed Ibrahim, age 56 year-old is a known diabetic for more than 12 years and is currently admitted for left foot cellulitis. Today is the day 4 of his admission. Since he has poor sugar control and partial compliance to treatment regimen, the doctors advise that he be started on S/C Insulin. On day 2 morning, the diabetic educator has taught him self-administration of insulin. He has been giving himself insulin since. He has no other known co-morbid.

He is prescribed the following medications:

1. IV Cloxacillin 500mg 6 hourly
2. PO Paracetamol 1gm TDS PRN
3. PO Senokot 2 tabs ON PRN
4. PO Glucophage 850mg BD
5. PO Aspirin 100mg OM
6. S/C Mixtard 18U OM
7. S/C Mixtard 22U ON

His vital signs by trend:

|                         | 12 noon | 4 pm   | 6 pm (Current) |
|-------------------------|---------|--------|----------------|
| Respiration rate (/min) | 15      | 18     | 28             |
| SpO <sub>2</sub> (%)    | 98      | 97     | 97             |
| Heart Rate (/min)       | 70      | 80     | 80             |
| Blood pressure (mmHg)   | 130/80  | 138/82 | 110/70         |
| Pain Score (/10)        | 2       | 1      | -              |
| Conscious level (AVPU)* | A       | V      | U              |

\*A-Alert, V-Voice, P-Pain, U-Unconscious

Physical assessment:

Lung sounds: Air entry clear bilateral

Heart sounds: S1S2, no murmur

Bowel sounds: Hypoactive

### Scenario 3

Mdm. Vasuki, age 62 year-old is admitted for? Bowel obstruction. She underwent laparotomy for adhesiolysis yesterday. Post operatively, she receive pain control, IV fluids and has an abdominal drain. Overnight, the drainage recorded 40ml blood. Dressing is dry and intact with spots of bloodstain.

She is prescribed the following:

1. IV Normal Saline 2 litres per day
2. IV Dextrose/Saline 1 litre per day
3. IV Ceftriazone 1gm 12 hourly
4. IV Metronidazole 500 8 hourly
5. IV Ciprofloxacin 400mg 12 hourly
6. IV Morphine 0 to 3 mg per hour (titrate to pain score)

Her vital signs by trend:

|                         | 8 am   | 12 noon | 2 pm (Current) |
|-------------------------|--------|---------|----------------|
| Respiration rate (/min) | 12     | 18      | 26             |
| SpO <sub>2</sub> (%)    | 98     | 97      | 97             |
| Heart Rate (/min)       | 88     | 105     | 118            |
| Blood pressure (mmHg)   | 110/80 | 102/82  | 82/30          |
| Pain Score (/10)        | 6      | 3       | 3              |
| Conscious level (AVPU)* | P      | V       | V              |

\*A-Alert, V-Voice, P-Pain, U-Unconscious

Physical assessment at 8 am:

Lung sounds: Air entry clear bilateral

Heart sounds: S1S2, no murmur

Bowel sounds: Absent

#### Scenario 4

Mdm. Poh Phing Phing, age 46 year-old is admitted following a road traffic accident. She suffered fractures to the right clavicle, right humerus and right shaft of femur. She underwent internal fixation of the right humerus and right shaft of femur. Right clavical fracture is planned for conservative treatment. Today is her first post-op day. Dressings are dry.

She is prescribed the following:

1. IV Normal Saline 6 litres per day
2. IV Pethidine 75mg in each unit of Normal Saline infusion (total to 450mg per day)
3. IV Ceftriazone 1gm 12 hourly
4. IV Cloxacillin 500mg 6 hourly

Her vital signs by trend:

|                         | 8 am   | 12 noon | 2 pm (Current) |
|-------------------------|--------|---------|----------------|
| Respiration rate (/min) | 20     | 20      | 40             |
| SpO <sub>2</sub> (%)    | 98     | 95      | 78             |
| Heart Rate (/min)       | 76     | 116     | 140            |
| Blood pressure (mmHg)   | 110/80 | 122/82  | 148/90         |
| Pain Score (/10)        | 4      | 4       | 7              |
| Conscious level (AVPU)* | A      | P       | P              |

\*A-Alert, V-Voice, P-Pain, U-Unconscious

Physical assessment at 8 am:

Lung sounds: Air entry clear bilateral

Heart sounds: S1S2, no murmur

Bowel sounds: Hypoactive