

# **Physiological Measurements Training for Care/Nursing & LD Small Group Home Staff**



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## Objectives

- To be able to recognise why it is necessary to record vital signs.
- To understand the range of equipment available to support the recording of vital signs.
- To be able to demonstrate effective use of equipment (may include blood pressure sphygmometer, thermometer, tympanic thermometer)
- Recognise the importance of accurately recording vital signs.
- To be able to record and document accurately the outcomes.
- To be able to identify when medical referral may be required using the National Early Warning Score as a supportive tool.

## **The National Early Warning Score (NEWS)**

NEWS ensures a standardised means of identifying and responding to patients in the community and in-hospital settings, who are unwell and are at risk of deteriorating

It is a simple scoring system that uses 6 physiological measurements which generate an individual score which when added together, the overall NEWS score determines a risk rating for the resident.

NEWS provides a continuous record of the patient's physiological status throughout which can be measured against a patient's baseline NEWS to identify any subtle or extreme changes in their condition.

NEWS can also facilitate a more effective handover to other Health Care Professionals i.e. OOH's, community nurses, ambulance staff and acute hospital staff and is particularly useful when requesting a GP visit.

NEWS can help define the appropriate level of on-going care required.

### 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

### National Early Warning Score (NEWS) thresholds and triggers

NEW scores	Clinical risk
0	Low
Aggregate 1 – 4	
<b>RED score*</b> <b>(Individual parameter scoring 3)</b> Aggregate 5 – 6	Medium
Aggregate 7 or more	High

## **Respiratory rate**

Respiratory rate (also known as ventilation rate or breathing rate) is the number of breaths a person takes during one minute. It is usually measured at rest, while sitting.

Medical textbooks suggest that the normal respiratory rate for adults is 12 to 20 breaths per minute at rest. Respiratory rate is a key marker of lung dysfunction and a resident who has a number of chronic health conditions such as heart disease, asthma, diabetes, COPD may have a high respiratory rate at rest which would be normal for them. This is why it is important to regularly have a baseline respiratory rate recorded for all residents to determine what is normal for each individual.

### **Abnormal Respiratory Rates**

Both an increased and decreased respiratory rate can be a sign that something is amiss in the body and there are many causes of both a fast and a slow rate. It is important again to note that the normal ranges are for people at rest, and respiratory rate will normally increase during movement and exercise.

### **Increased Respiratory Rate**

What is an elevated respiratory rate? In adults, the cut-off is usually considered a rate over 20 breaths per minute, a rate of over 24 breaths per minute would indicate something is wrong. However still bear in mind that an increased respiratory rate may be normal for patients with certain chronic conditions

There are many causes of an increased rate, some that are related to the lung function and some that are not. Some of the more common causes include:

- Fever
- Dehydration – Dehydration alone can result in a rapid rate of breathing.
- Asthma – During an asthma attack, respiratory rate is often increased.
- COPD – (Chronic obstructive pulmonary disease)
- Hyperventilation – People may breathe more rapidly in response to stress, pain, anger or during a panic attack.
- Lung conditions – Such as lung cancer, pulmonary embolism (blood clots in the legs that travel to the lungs.)
- Infections – Common and uncommon infections such as the flu, pneumonia, and tuberculosis can result in rapid breathing.
- Acidosis – An increase in the acidity of the blood results increases respiratory rate. This can occur when a person has a conditions such as diabetes and kidney disease

### **Decreased Respiratory Rate**

A lowered respiratory rate, defined as a rate less than 12 can also be a sign of concern. Some main causes of a decreased rate include:

- Medication – Some medications such as narcotics used for medical purposes can suppress respiration.
- Sleep Apnoea – With sleep apnoea, people often have episodes of apnoea and a decreased breathing rate mixed with episodes of an elevated breathing rate.
- Lung conditions – Severe and life threatening exacerbations of asthma and COPD will cause a low respiratory rate
- Brain conditions – Damage to the brain, such as strokes and head injuries often result in a decreased respiratory rate.

## **How to record a Respiratory rate**

1. Measure the respiratory rate when the resident is at rest.
2. Try not to let the resident become aware that you are monitoring respirations so you can obtain a more reliable count (people tend to breathe faster or irregular if they know they are being monitored).
3. Observe the rise and fall of the resident's chest and count the number of respirations for one full minute. One respiration consists of one complete rise and fall of the chest, or the inhalation and exhalation of air.
4. Check to see if the breathing is regular or irregular and if the breathing is noisy e.g. wheezes or rattles.
5. Record on the residents NEWS chart, the date, time and respiratory rate. In the residents notes record any abnormal findings such as breathing characteristics e.g. if breathing is regular/irregular or if there is a noise/wheeze that can be heard.

### **Tips for observing respiration**

You may be able to count the respirations from the chest movement however this is not always possible especially when someone is wearing loose clothing. You can try:

- Looking at the patients mouth and nose for signs
- Observe shoulders moving during breathing
- If the patient is lying or sitting, try placing their arm across their chest and observing the arm being moved during breathing

## **Oxygen Saturations**

Oxygen saturation refers to the level of oxygen carried by red blood cells through the arteries. As red blood cells travel through the lungs, they are saturated with oxygen. A low saturation level could indicate a respiratory illness or other medical conditions.



Oxygen saturations are measured by using a Pulse Oximeter. Oxygen is carried in the blood attaches to haemoglobin molecules. A pulse oximeter detects how much oxygen the blood is carrying as a percentage of the maximum it could carry.

A pulse oximeter shines two beams of light through a finger (or earlobe etc.), one beam is red light (which you can see when a pulse oximeter is used) and the other is infrared light (which you can't see). These two beams of light allows the pulse oximeter detect what colour the arterial blood is, and it can then work out the oxygen saturation. However there are lots of other parts of a finger which will absorb light (such as venous blood, bone, skin, muscle etc.). So to work out the colour of the arterial blood, a pulse oximeter looks for the slight change in the overall colour caused by a beat of the heart pushing arterial blood into the finger.

This change in colour is very small so pulse oximeters work best when there is a good strong pulse in the finger (or ear etc.) the probe is on. If the signal is too low the measured oxygen saturation may not be reliable, and if very low the pulse oximeter will not be able to work.

A common problem is that people can have cold hands and feet, and have only a very weak pulse in this area. In this case a pulse oximeter may display a reading but it might not be accurate. Some pulse oximeters have a means of indicating how strong the signal is they are receiving and it is important to check this. A very weak signal may mean the pulse oximeter is not able to work accurately or at all.

An irregular signal can also cause problems for a pulse oximeter trying to determine oxygen saturation and pulse rate. This can be caused by an irregular heartbeat or by the patient moving, shivering or fidgeting.

Poor positioning of the probe can cause inaccurate readings due to various problems. This can be a particular problem with very small or very large fingers. Make sure the probe is well positioned on the finger. Nail varnish can also affect the reading.

## **Normal Oxygen saturations**

Once an oxygen saturation reading has been taken this should be recorded in the patients NEWS chart.

## **Temperature**

Temperatures can be measured by using a number of different instruments. The instruments used by a number of care homes are either a digital forehead thermometer or a tympanic thermometer. The instrument provided with the Telehealth tablet will be a tympanic thermometer.

A tympanic thermometer uses the tympanic membrane (eardrum) to measure temperature. The eardrum is an extremely accurate point to measure body temperature from because it is recessed inside the head (just like your tongue).

### **Using a tympanic thermometer**

[https://www.youtube.com/watch?v=Y2gvd0pAX\\_A](https://www.youtube.com/watch?v=Y2gvd0pAX_A)

## **Blood Pressure**

Blood pressure (BP) is the pressure exerted by circulating blood upon the walls of blood vessels. It is usually measured at a person's upper arm. Blood pressure is usually expressed in terms of the systolic (maximum) pressure over diastolic (minimum) pressure and is measured in millimetres of mercury (mm Hg).

### **Blood pressure readings**

Blood pressure has 2 readings, systolic and diastolic. For example, if the blood pressure reading is "140 over 90", or 140/90mmHg, it means the systolic pressure is 140mmHg and a diastolic pressure is 90mmHg

**Systolic (Top reading)** - The pressure of the blood when your heart beats to pump blood out.

**Diastolic (Bottom reading)** - the pressure of the blood when your heart rests in between beats. A normal diastolic blood pressure number is between 60 and 80. A diastolic blood pressure number of 90 or higher, on repeated measurements, is considered to be hypertension or high blood pressure.

A blood pressure reading of approximately 120/80mmHg is considered to be ideal. However the systolic pressure tends to rise with age.

Detection and treatment of high blood pressure can prevent heart disease, stroke, eye problems, or chronic kidney disease.

People with a blood pressure reading below 90/60mmHg are usually regarded as having low blood pressure.

### **Recording a blood pressure**

The majority of the time a blood pressure can be taking using an automatic BP monitor. However in some cases there may be a need to have a blood pressure recorded using a manual BP monitor e.g. when the patient has an irregular heart rate.

<https://www.youtube.com/watch?v=YM3iXS146Yc>

<https://www.youtube.com/watch?v=Gmic13mvsgo>

<https://www.youtube.com/watch?v=bHXvhOQ0hYc>

## Heart Rate

A pulse is your heartbeat. The range for an adult pulse is 60 to 100 beats a minute.

You can feel a pulse rate at the wrist and brachial artery in the fold of your arm and at the neck

When checking the pulse rate you are also looking for the rate rhythm and volume.

- Is the pulse fast or slow (**pulse heart rates outside of normal ranges should be escalated to a qualified nurse**).
- Is the pulse strong or weak?
- Is it the pulse regular or irregular (**new irregular heart rates must be reported to the residents GP**)

### How to take a Heart rate

Gently place 2 fingers of the radial artery and count the beats for 30 seconds then double to get the number of beats per minute. Do not use your thumb, because it has its own pulse that you may feel.



If the resident's blood pressure is low you may not feel a pulse at the radial artery, you can try to feel the pulse at the brachial artery



If no heart rate can be felt at the brachial artery then move to the resident's neck to feel the carotid artery.



## **Level of Consciousness using AVPU**

### **A= Alert and Oriented**

The patient is alert and oriented to person, place, time and event.

### **V = Verbal**

The patient responds to verbal stimuli.

### **P = Pain**

The patient responds to painful stimuli with a purposeful or non-purposeful movement.

### **U = Unresponsive**

The patient does not respond to any stimuli.