



Vital Signs

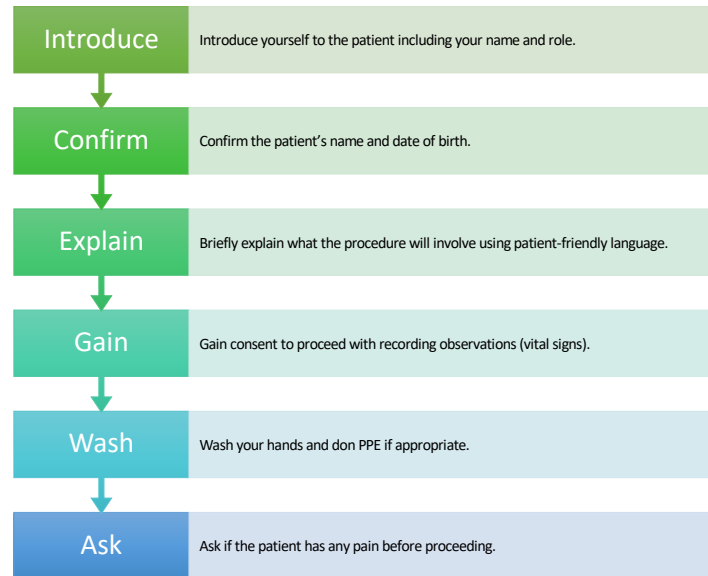
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Preparation

- Pulse oximeter
- Blood pressure monitor
- Thermometer
- Watch
- NEWS2 chart

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Introduction



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Assessing Heart Rate

Palpate the patient's **radial pulse**, located at the radial side of the wrist, with the **tips** of your **index** and **middle fingers** aligned longitudinally over the course of the artery.

Once you have located the radial pulse, assess the **rate** and **rhythm**.

You can calculate the heart rate in a number of ways, including measuring for 60 seconds, measuring for 30 seconds and multiplying by 2 or measuring for 15 seconds and multiplying by 4.

For **irregular rhythms**, you should measure the pulse for a **full 60 seconds** to improve accuracy.

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- [https://www.osmosis.org/learn/Introduction_to_vital_signs_\(for_nursing_assistant_training\)](https://www.osmosis.org/learn/Introduction_to_vital_signs_(for_nursing_assistant_training))

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Normal and abnormal heart rates

- In healthy adults, the pulse should be between **60 – 100 bpm**. An **irregular rhythm** is most commonly caused by **atrial fibrillation**, but other causes include ectopic beats in healthy individuals and atrioventricular blocks.
- A pulse **<60 bpm** is known as **bradycardia** and has a wide range of aetiologies (e.g. healthy athletic individuals, atrioventricular block, medications, sick sinus syndrome).
- A pulse of **>100 bpm** is known as **tachycardia** and also has a wide range of aetiologies (e.g. anxiety, supraventricular tachycardia, hypovolaemia, hyperthyroidism)

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Respiratory Rate

- Whilst still palpating the radial pulse (but no longer counting it), **assess the patient's respiratory rate**. Palpation of the radial pulse at this stage purely to avoid making the patient aware you are directly observing their breathing, as this can itself alter the respiratory rate.
- Note any **asymmetries** in the **expiratory** and **inspiratory phases** of respiration (e.g. the expiratory phase is often prolonged in asthma exacerbations and in patients with COPD).
- Assess the patient's respiratory rate for 30 seconds and then multiply by 2 to calculate the number of breaths per minute

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Respiratory Abnormalities

- In healthy adults, the respiratory rate should be between **12-20 breaths per minute**.
- A respiratory rate of **fewer than 12 breaths per minute** is referred to as **bradypnoea** (e.g. opiate overdose).
- A respiratory rate of **more than 20 breaths per minute** is referred to as **tachypnoea** (e.g. acute asthma).

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Oxygen Saturation

- Oxygen saturation is measured using a **pulse oximeter**. When recording oxygen saturations, note whether the patient is on supplemental oxygen or breathing room air.
- Select an appropriate site for the pulse oximeter. If using the fingernail, ensure there is no nail varnish or dirt covering the nail.
- Switch on the pulse oximeter.
- Place the pulse oximeter over the fingernail.
- Wait for the oxygen saturation level to appear and note the reading.

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Measuring Spo2

- These clients require [pulse oximetry](#), which is a non-invasive, easy, and pain-free method of measuring the amount of oxygen carried by the hemoglobin in the red blood cells.
- This is known as arterial [blood oxygen saturation](#), or SaO2 for short. Maintaining a normal SaO2 ensures that the amount of oxygen that travels through the bloodstream to tissues around the [body](#) is adequate.
- Now, a [pulse oximeter](#) consists of a probe, which is attached by a cable to a [pulse oximeter](#). That probe has a light source on one side and a photodetector, or sensor, on the other side.
- So, when it gets clipped onto a [body](#) part, a light shines through the tissues on one side, and on the other side, the sensor detects how much light has been absorbed by the arterial blood in the tissues.

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Reading Spo2

- Anything below that is considered low for most clients. But, if it [falls](#) below 85%, it can get really dangerous for the client.
- This may occur in clients with various [lung conditions](#) that interfere with [gas exchange](#), meaning movement of oxygen and [carbon dioxide](#) between the blood, lungs, and tissues.
- In other cases, though, readings can be falsely low because of poor [blood flow](#) to the extremities, which makes it hard for the [pulse oximeter](#) to pick up a proper signal.
- Now, this could be due to [peripheral vascular disease](#), which happens when one of the arteries supplying the extremities becomes narrowed, as well as [hypotension](#), or [low blood pressure](#); [hypothermia](#), or decreased [body temperature](#); several medications; peripheral edema, or accumulation of fluid and swelling of the limbs; smoke inhalation; or [carbon monoxide poisoning](#).

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Inaccurate Readings

- Readings can also be inaccurate due to motion artifacts, like when the client is shivering or restless, meaning that false signals are generated when they shouldn't be.
- Readings may also be inaccurate if the client is wearing nail polish, or if bright light, such as sunlight, is shining on the probe, making it harder to measure the oxygen saturation.

Before clipping on a [finger](#) probe, check for the presence of nail polish or artificial [fingernails](#) and remove them. In general, never place the probe on a thumb.

Also, don't put the probe on the same limb as a blood pressure cuff; otherwise, the probe reading will be inaccurate whenever the cuff inflates.

Finally, to get the clearest reading, avoid exposure of the probe to direct bright light

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Target saturation

- NEWS2 has two different scales for recording oxygen saturation:
- **Scale 1** has a target oxygen saturation of $\geq 96\%$ and is used for most patients.
- **Scale 2** has a target oxygen saturation of 88 – 92% and is used for patients at risk of hypercapnic respiratory failure (e.g. patients with COPD).

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Reporting abnormal Spo2

As a nursing assistant, you are responsible for placing the probe on the appropriate site;

- using an appropriate probe for the site
- observing the skin integrity, [color](#), moisture, and temperature; a
- recognizing and [reporting low SpO2 values](#) or any unusual signs or symptoms.
- Remember to document the [SpO2](#) reading along with your observations.

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Level of consciousness

- A patient's level of consciousness can be measured using the **ACVPU scale**:
- **Alert**: the patient is fully alert with spontaneous eye-opening
- **Confusion (new)**: the patient is alert, but confused or disorientated
- **Voice**: the patient responds to a verbal stimulus.
- **Pain**: the patient responds to a pain stimulus only.
- **Unresponsive**: no response to voice or pain stimulus.

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Temperature

Temperature is usually assessed using a **tympanic thermometer** as this is a rapid and non-invasive way of recording temperature.

Other methods for recording temperature include **oral**, **rectal** and **axillary** readings.

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Measure temperature using a tympanic thermometer

- The exact method of use will depend on the brand of the tympanic thermometer. Always follow the **manufacturer's instructions** and local guidelines.
- Ensure the tympanic thermometer is switched on, clean and in good working order.
- Place a **disposable cover** over the probe end.
- Place the probe into the ear canal and gently advance until the probe seals the opening of the ear canal.
- Record the tympanic temperature.
- Remove and dispose of the tympanic thermometer cover.

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NEWS 2

NEWS2 is a **track-and-trigger system** used to identify adult patients at risk of clinical deterioration. The score is comprised of six components:

- Respiratory rate (RR)
- Oxygen saturation (SpO₂)
- Temperature
- Systolic blood pressure (BP)
- Heart rate (HR)
- Level of consciousness

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Physiological parameter	3	2	1	Score 0	1	2	3
Respiration rate (per minute)	≤8		9–11	12–20		21–24	≥25
SpO ₂ Scale 1 (%)	≤91	92–93	94–95	≥96			
SpO ₂ Scale 2 (%)	≤83	84–85	86–87	88–92 ≥93 on air	93–94 on oxygen	95–96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91–100	101–110	111–219			≥220
Pulse (per minute)	≤40		41–50	51–90	91–110	111–130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥39.1	

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Recording on NEWS2 Chart

- **Recording observations on a NEWS2 chart**
- The measured observations should be recorded on a **NEWS2 chart** and the total NEWS2 score calculated.

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NEWS2 key		FULL NAME		DATE OF ADMISSION	
NEWS2 key		DATE OF BIRTH	DATE OF ADMISSION		DATE
NEWS2 key		TIME	DATE	TIME	DATE
A+B Respirations per minute	≤10	10	11	12	13
	11-20	20	21	22	23
	21-30	30	31	32	33
	31-40	40	41	42	43
	≥41	44	45	46	47
A+B SpO2 % on room air	≤92	93	94	95	96
	93-94	95	96	97	98
	95-96	97	98	99	100
	97-98	99	100	101	102
	≥99	103	104	105	106
C Pulse beats per minute	≤50	51	52	53	54
	51-60	61	62	63	64
	61-70	71	72	73	74
	71-80	81	82	83	84
	≥81	85	86	87	88
D Temperature °C	≤35.5	35.6	35.7	35.8	35.9
	35.6-36.0	36.1	36.2	36.3	36.4
	36.1-36.6	36.7	36.8	36.9	37.0
	36.6-37.0	37.1	37.2	37.3	37.4
	≥37.1	37.5	37.6	37.7	37.8
NEWS2 TOTAL		NEWS2 TOTAL		NEWS2 TOTAL	
Monitoring frequency		Monitoring frequency		Monitoring frequency	
Escalation of care (N/A)		Escalation of care (N/A)		Escalation of care (N/A)	

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Completing the Assessment



To complete the assessment...



Explain to the patient that the assessment is now **complete**.



Thank the patient for their time.



Dispose of PPE appropriately and **wash your hands**.



Summarise your findings and NEWS2 score.

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