Vital signs and monitoring

by Marie McCullagh & Ros Wright

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NURSING LESSONS WORKSHEET

A Pre-reading

1. **Drawing on your experience or theoretical knowledge, note down the factors that can affect the four main vital signs (e.g. exercise, anxiety, etc.).**
   a. Respiratory rate
   b. Pulse rate
   c. Blood pressure
   d. Body temperature
2. **Before you read, with a partner, discuss what you understand by the following:**
   a. accessible site
   b. non-invasive method
   c. 'white coat effect'

B Word building

1. **Match the words to the definitions.**

anterior **contracted** **pounding** **rotate** **uppermost**

a. Beating unusually strongly. _____
b. At or towards the front of. _____
c. A part that is higher than the rest. _____
d. Turn in a circular movement. _____
e. Become smaller. _____

C Comprehension check

1. **As you read the article, check your answers to the points in the Pre-reading task 1.**
2. **Now do the same for Pre-reading task 2.**
3. **As a group, discuss ways in which you might distract a toddler when taking their vital signs.**

D Vocabulary development

1. **Without looking back at the text, find a meaning for each prefix.**

Prefix	Meaning
brady-	
ab-	
hyper-	

Prefix	Meaning
ap-	
tachy-	
hypo-	

2. **Skim the text to check your answers and see the context in which they are used.**
3. **With a partner, look at the base words in the table below and choose the best negative prefix in each case.**

ir- *ab-* *in-* *im-* *un-* *dis-*

Prefix	Base words
	balance
	normal
	curable

Prefix	Base words
	rational
	conscious
	ability

2. **Using a good medical dictionary, find two or more examples for each.**

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Vital signs are measurements of the body's most basic functions. There are four main vital signs commonly used by health practitioners:

1. Respiratory rate
2. Pulse rate
3. Blood pressure
4. Body temperature

1. Respiratory rate is the number of breaths recorded in one minute without the client's knowledge while he is at rest. Respiratory rate can be assessed by sitting at the patient's right side and taking the pulse in their left wrist while laying their hand on their upper abdominal area. Normal resting respiratory rates for adults range from 15–20 breaths per minute and 20–25 breaths per minute for children between 5–12 years old. However, in certain conditions, abnormalities of the rate of breathing may occur:

- **Bradypnoea** is abnormally slow breathing. It is a normal phenomenon during sleep but in ill-health may indicate oversedation, opiate poisoning or the presence of a cerebral lesion.
- **Tachypnoea** is abnormally fast breathing.
- **Apnoea** occurs when breathing stops temporarily.

When you have completed this observation, keep hold of the wrist as if you were still counting the pulse; you can then feel the chest or abdomen moving against your hand.

2. Pulse rate

The heart rate is most commonly assessed by calculating the pulse rate, which is the number of beats in a 60-second period. The pulse is detected by placing two fingers over an artery close to a bony or firm surface. The most common site used for pulse rate detection in adults and children over the age of two years is the radial pulse because it is one of the most easily detected and accessible sites. This can be felt on the anterior aspect of the wrist. The arm should be supported and relaxed and the palm rotated uppermost. The pulse should be felt with the index and middle fingers over the groove along the thumb side of the inner wrist. Toddlers may need distracting to ensure accurate counting of the pulse.

Normal heart rates for children and adults are shown here:

Age (years)	Heart rate (beats per minute)
<1	110–160
1–2	100–150
2–5	95–140
5–12	80–120
12–adult	60–100

When assessing a person's pulse, three factors should be observed: its rate, rhythm and strength. A heart rate faster than the normal values shown in the table is known as a *tachycardia*. In adults this is considered to occur when the heart rate is over 100 beats per minute. Causes of an increased rate include exercise, stress, fear, excitement, fever or blood or fluid loss, certain drugs and heart conditions. A heart rate slower than the normal values show in the table is known as a *bradycardia*. In adults, this is considered to occur when the heart rate is less than 60 beats per minute. Causes

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of a slow heart rate include hypothermia, certain drugs, for example beta-blockers and certain heart conditions. However, a slow heart rate may also be a normal finding in fit athletic individuals.

The accurate recording and reporting of an abnormally fast or slow heart rate is essential. It will often indicate a sudden change in a person's condition that needs to be further assessed and possibly treated. The rhythm of the pulse is the pattern in which the beats occur. In a healthy person, the pattern or rhythm is regular because the chambers of the heart are contracting in a co-ordinated manner, producing a regular pulse beat.

The strength or volume of the pulse is important because it can provide an indication of the person's cardiac function, cardiac output and probable blood pressure. A pulse that is weak and difficult to feel will usually be rapid and may disappear when pressure is applied to the artery, suggesting that the patient is dehydrated, bleeding or exhausted. A strong and pounding pulse may be the result of infection, stress anaemia or exercise.

3. Blood pressure

A routine component of the cardiovascular assessment is the measurement and recording of blood pressure which is the pressure exerted by the blood on the walls of a blood vessel. The maximum pressure is known as the systolic pressure and the minimum pressure that occurs during relaxation of the heart is known as the diastolic pressure. The most frequent, non-invasive method of measuring arterial blood pressure employs a shygmomaometer. The frequency of recording will depend on the patient's condition, the reason for admission and the results of the reading. It is therefore essential that the technique is performed accurately, on the same arm each time, and that the patient is prepared prior to the procedure.

The effects of anxiety should also be considered, and ideally patients should be as relaxed as possible prior to a blood pressure recording. However, it is notable that in some groups of patients, a phenomenon known as 'white coat hypertension' or the 'white coat effect' can occur. In these circumstances, anxiety relating to an anticipated recording of results is a stress effect that artificially raises the blood pressure.

4. Temperature

Normal body temperature can range from 36.5°C, to 37.2°C. Body temperature may be abnormal due to fever (high temperature) or hypothermia (low temperature). A fever is indicated when body temperature rises above 38.5°C.

Adapted from *Foundations of Nursing Practice* (3rd Edition), edited by Richard Hogston and Barbara A. Marjoram: Palgrave Macmillan (2008). Reproduced with permission from Palgrave Macmillan.

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E Discussion

1. **Read the case study.**

> Davol Singh is a 62-year-old gentleman who has presented to the nurse at this general practice. He reports that he has had several episodes of chest pain and shortness of breath while undertaking his daily walk over the past few weeks. His last episode of chest pain was one hour ago, and he remains slightly short of breath on arrival at the GP surgery. […] Mr Singh is known to be a heavy smoker (30 a day) and suffers from raised cholesterol.

2. **In pairs, discuss what kind of assessment you would carry out initially on this patient before he is seen by the doctor. Then present your ideas to the rest of the group, explaining your reasons.**

F Follow-up

Using reference books or the Internet, research one of the main vital signs in more detail, as if preparing for a presentation for your colleagues; find useful diagrams and facts to illustrate your presentation. The following points may be considered:

age, sex, race, weight, lifestyle (change of), different methods for taking readings

Keep a record of where you found the information.

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ANSWER KEY

A Pre-reading

Encourage your learners to put their professional knowledge into practice. This kind of 'self analysis' can be useful for both learner and trainer. It also serves as an introduction to the article.

NB: A pre-experience nurse may not be able to come up with all of these. Reassure them they will be meeting these points in the text.

B Word-building

1. pounding
2. anterior
3. uppermost
4. rotate
5. contracted

C Comprehension check

1. a. Respiratory rate can be affected by: the patient being asleep, opiates, cerebral lesion
   b. Pulse can be increased due to: exercise, stress, fear, excitement, loss of blood or fluids, certain drugs and heart condition.
   Pulse can be decreased due to: hypothermia, certain drugs (e.g. Beta-blockers) and heart condition.
   c. Blood pressure may be affected by anxiety.
   Your learners may also mention some of the above points.
   d. Body temperature may be affected by: fever, exercise, ill health, hypothermia.
2. a. An area on the body that is easy to reach without removal of clothing, being in an unconformable or embarrassing position so that the nurse can take the patient's temperature, for example.
   b. A method that does not involve penetrating healthy tissue.
   NB: This can not be deduced from the text, but some of your learners may already know this from their professional experience.
   c. Where the patient anticipates there will be a problem and as a result (in this case) their blood pressure rises artificially.
3. Using pictures on the wall, by talking to them. The nurse might ask the parent/carer to talk to the child. Reassurance during and praise following the procedure are also important strategies to use. Sometimes nurses will use a toy (teddy bear) to demonstrate the procedure to the child.

D Vocabulary development

1.

Prefix	Meaning
brady-	slow
ab-	negative
hyper-	excess

Examples from text	Your example(s)
ap-	absence
tachy-	fast
hypo-	low

2. *bradypnoea, bradycardia / tachypnoea, tachycardia / apnoea / abnormal / hyperthermia / hypothermia*
NB: Encourage your learners where possible to learn prefixes (and suffixes) in pairs – a strategy to help them remember – *tachy + brady / hyper + hypo*

3.

Prefix	Base words
im-	balance / mobile / mature
ab-	normal
in-	curable / continent / experienced

Prefix	Base words
ir-	rational / reversible / responsible
un-	conscious / natural / desirable
dis-	ability / respect / connect

Other common negative prefixes are: *a- / de / il- / no- / non-*

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ANSWER KEY

NB: Point out to learners that there are few 'rules' for this language item. However you can at least suggest the following:

im- is used with words beginning with *m* and *p*
ir- is used with words beginning with *r*
il- is used with words beginning with *l*

E Discussion

General observation:

- notice the pallor, colour and texture of the patient's skin
- general appearance (is s/he well kempt and appropriately dressed)
- expression (does s/he appear in pain, does s/he look their age)
- movement (posture, gait, coordination)
- mental alertness of the patient

Weight and height

Respiration

Pulse

Blood pressure