

Respiratory system and breathing



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The ease of breathing is a subconscious action that is a fundamental part of life. A professional manner is the foundation on which an assessment and quality patient care is built.

It is vital that nurses have sound knowledge of the anatomy and physiology of the respiratory system to be able to carry out a respiratory assessment. It is essential that nurses are able to recognise and assess symptoms of respiratory dysfunction to provide early, effective and appropriate interventions to improve patient outcomes. It is necessary for a nurse to have a comprehensive knowledge base of the anatomy and physiological process of a healthy functioning pulmonary system, in order to carry out a respiratory assessment (Jenkins, 2003, p124, Kennedy, 2007, p42 & Crisp and Taylor, 2005, p639). The respiratory system consists of the upper airway, including the nasal passages, sinuses, pharynx and larynx and the lower airway includes the trachea, bronchi, lung, bronchioles and alveoli. The main purpose of the respiratory system is to provide oxygen to all the cells in the body and to remove the by-product of carbon dioxide. This is why respiratory assessment should be carried out by a competent nurse that can easily identify potential respiratory defects in patients (Moore, 2007, p56).

The skills the nurse must use to gather relevant information during a breathing assessment include interviewing skills, observation skills and listening skills (Crisp and Taylor, 2005, p634). Jenkins (2003, p138) states that there are three phrases involved in assessment. These include a collection of data, interpretation of the data to assess the degree of alteration in breathing and identifying the individual's actual and potential problems relating to breathing. A respiratory assessment should begin with a

patient's history, as it is a vital element and provides clues to the cause of respiratory difficulty or failure. If properly recorded it provides the nurse with an organised, unbiased, detailed and chronologic report of the development of symptoms that has caused the patient to seek health care (Wilkins, et al, 2003, p12).

When proficiently obtained, the history provides enough sufficient information for an accurate diagnosis and care plan. Finesilver (2003, p42, cited in Kennedy, 2007) claims that ' the physical examination only serves to reinforce the information derived from the history and allows the nurse to assess the patient's mental state and whether he or she is orientated to time or place'. When conducting a respiratory assessment a quiet and calm atmosphere is ideal, although in reality, complications can occur (Kennedy, 2007, p43). The appropriate use of eye contact is one of the most significant and prevailing techniques for indicating true concern about a patient.

Eye contact should be established often enough and long enough to be encouraging but should not be persistent that it makes the patient feel uncomfortable (Wilkins et al, 2000, p8). Jenkins (2003, pp138-142) and Kennedy (2007, pp42-43) state that a nurse should consider the following when gaining history information. The assessment should include a medical, surgical, social, family, and smoking history. Closed questions should be used appropriately to minimise any suffering if the patient is intensely breathless.

Explain terms and issues in simple terms and check for understanding within the individual so there is no confusion. Using silence allows for the person to

rest or think and gives the nurse to write down detailed information. The nurse should prioritise questions so the most vital questions are asked first. Alternative sources for gathering a patient's history is to involve; relatives, friends, work associates, previous physicians and past medical records, as they can provide a more accurate picture of the history and progression of symptoms (Wilkins, 2000, p14).

History taking maybe limited depending on the severity of the breathing disfigurement and therefore observation skills may need to be used (Moore, 2007, p51). Observation skills are used by nurses constantly and encompass the components of verbal and nonverbal cues, physical signs and psychological cues (Jenkins, 2003, p140). When assessing a patient for breathing, the nurse should evaluate the patient's general appearance. These include vital signs such as the respiratory rate, depth of breathing, rhythm of breathing, changes in breathing habit, positioning and facial expressions, colour of skin and nail beds, assessment of pain, cough and sputum and pulse oximetry (Jenkins, 2003, pp138-142, Kennedy, 2007, pp34-44). Mallik et al (1998, p199, cited in Jenkins, 2003, p141), affirms that it is 'relatively easy for a nurse to assess breathing by observing the rate, depth and rhythm of respiration' to determine baseline data of the patient's breathing function.

A patient with a respiratory problem should be observed on admission, pre- and postoperatively to be able to monitor efficiently (Jenkins, 2003, p141). The normal respiratory rate in a healthy adult is called eupnoea and normally between twelve and eighteen times per minute. If a patient is experiencing a rapid rate due to increased psychological cue such as anxiety, it is referred

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to as tachypnoea. However, slow breathing commonly known as bradypnoea, can be an indication of a head injury or sleep for example. The absence of breathing is apnoea, which last for at least ten seconds (Jenkins, 2003, p141 & Crisp and Taylor, 2005, p439).

Observation of the depth of breathing is important and the nurse should be able to identify the chest movement as either: normal, shallow or deep. Both side of the chest should expand on inspiration and signs of irregularity become prominent in the chest when the respiratory system is affected (Jenkins, 2003, p141 & Kennedy, 2007, p44). If observing fails for the nurse to gain adequate information, the chest movements can be felt by touching either side of the patient's chest (Kennedy, 2007, p44). Dyspnoea, wheezing and unusual sounds including harsh and high-pitched noises, occur when a patient's breathing becomes abnormal whilst they trying to breathe. This indicates to the nurse that there is abnormal quality of the patient's breathing and indicates a respiratory problem.

It is important for a nurse to assess how the patient is coping and the strategies they use to reduce their dilemma (Jenkins, 2003, p141-142). The patient's posture indicates the level of breathing difficulty he or she is experiencing. Sometimes a patient will position themselves in an unusual position in order to make breathing easier. The position a patient is holding while breathing can give a nurse a lot of information.

For example, patients with an increased effort of breathing are usually inclined to sit as upright as possible with pursed lips, where as a patients with impaired breathing habitually adopt a tripod position, with their arms

resting on their knee's or a table (Kennedy, 2007, p44). The colour and condition of a patient's skin and extremities, including nail beds, can indicate respiratory failure. Cyanosis, a bluish colour of the skin and mucus membranes, should be observed as this means there is an inadequate level of oxygen reaching the patient's extremities (Moore, 2007, p52). A respiratory assessment should involve a pain assessment including the nature, type, duration and severity.

Alterations can occur in breathing when a patient is experiencing pain in any part of the body (Jenkins, 2003, p142). Chest pain is often aggravated by a cough and deep inspiration and the nurse should ask the patient to describe their cough and how long they have had it whilst determining the presence (Kennedy, 2007, p43). If any, a patient is asked about the quantity, colour, consistency and odour of their sputum. A 'dry' cough has minimal sputum as opposed to a 'loose' cough is associated with the production of sputum (Jenkins, 2003, p142 & Kennedy, 2007, p43). The colour must be noted as it can range from clear, an infection depending on the severity which is either green, yellow and grey, to blood stained sputum, haemoptysis, which can be life threatening (Jenkins, 2003, p142 & Kennedy, 2007, p43).

Abnormal odour emanating from sputum signifies infection where as normal sputum has little or no odour (Jenkins, 2003, p142). According to Moyle (2002, cited in Moore, 2007. p53-54) the main function of pulse oximetry is to distinguish hypoxaemia, insufficient oxygen content in blood, before noticeable warning signs are displayed. This procedure is non invasive and enables constant and brisk monitoring of a patient's oxygenation and is used as a part of a nursing assessment (Kennedy, 2007, p44-45). Therefore nurses

must be knowledgeable and competent in using their skills of doing vital signs and to be able to determine a patient's health status.

Listening carefully to what a patient has to say is another technique that enables the nurse to communicate effectively (Wilkins et al, 2000, p8). Good eye contact, asking for clarification on certain points and brief note taking demonstrate active listening. Breathing is usually silent so it is important to listen for breathing sounds including abnormalities (Jenkins, 2003, p142). According to Kennedy (2007, p45) adventitious breath sounds are breath sounds that are abnormal or extra due to limitation or inequitable obstruction or when fluid has accumulated thus blocking the airway. Auscultation involves listening to breath sounds with a stethoscope and is a main factor when conducting a respiratory assessment.

It allows the nurse to listen beyond normal breath sounds. Identifying the nature of respiratory malfunction is imperative as it determines the underlying causes and interventions (Moore, 2007, p54). From the assessment and resulting information a competent nurse is then able to identify nursing actions that would assist the patient's breathing habit. Identifying priorities, establishing short and/or long goals, determining nursing actions and interventions required and documenting the plan. The must be considered by the nurse when planning nursing activities in accordance with the individual's problem and level of breathing (Jenkins, 2003, p145).

The aim of managing respiratory failure is to allow sufficient oxygen to parts of the body where necessary. This can be accomplished through

supplementary oxygen by the use of oxygen therapy, administration of prescribed medications and/or nebulisers, localised airway passage obstruction and/or postural drainage, artificial airway maintenance and cardiopulmonary resuscitation. The level of dependency or independency is linked with the lifespan which are underpinned by factors affecting breathing (Jenkins, 2003, pp138 - 139). Factors influencing the activity of living of breathing include physical, psychological, sociological, environmental and politicoeconomic.

Dependent patients may require the need for oxygen therapy which is used to increase the supply of oxygen to the lungs and therefore increases the amount of oxygen available to the patient's body (Jenkins, 2003, 148-149 & Moore, 2007, p55). Depending on the amount and concentration of oxygen required and the level of the patients condition, the delivery device required may be low or high, nasal cannulae or masks. Nasal cannulae are simple devices, and allow for other activities of living such as eating and washing to be continued as normal as opposed to masks that fit over the patient's mouth, nose and chin (Jenkins, 2003, p148-149). When the oxygen is being administered, it is necessary for the patient to be sitting upright to maximise lung expansion (Jenkins, 2003, p148 & Moore, 2007, p55). Administration of drug therapies such as Ventolin and nebulisers are other nursing actions that would help the person's breathing activity. When an infection is present these moist inhalations are often used to loosen and eventually diminish discharge in the upper respiratory system (Jenkins, 2003, p149).

It is important for the nurse to be aware of side affects of the drug therapies being administered (Jenkins, 2003, p149). Localised airway can occur when

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an individual is experiencing a blocked airway due to obstruction. It is important to clear the airway in order for supplement oxygen to be inserted. Suction may be required to remove foreign material, blood or vomit' (Jenkins, 2003, p151). Postural drainage and/or positioning are important as they are used to encourage the simplicity of breathing (Jenkins, 2003, p151).

Excessive amounts of sputum build up need to be removed from the patient's body before any damage is done and to encourage enhanced blood flow to the areas needed. According to Liddie (2000, cited in Jenkins, 2003, p151) ' postural drainage is where a person is placed in a variety if positions and treated by percussion'. Clearing the airway may not be feasible by some of the nursing actions as stated previously yet is crucial that the patient's airway is maintained. As a result, an artificial airway maintenance may need to be inserted for example, a tube that is inserted through the mouth to the trachea (Jenkins, 2003, p152). Jenkins (2003, p153-154) claims that cardiopulmonary resuscitation involves three procedures: airway, breathing and circulation.

Airway refers to providing and maintaining a non-obstructed airway. Breathing is the supply of oxygen to the blood. If the patient's lungs are receiving an insufficient supply of oxygen, the second resort is to supply artificial ventilation. The nurse should observe the patients chest to ensure they are receiving the oxygen. If a pulse is not identified, cardiac compressions must be started immediately to gain blood flow back (Jenkins, 2003, p153-154).

Once the assessment is complete, a documentation of the care provided and the patient's response is essential to the entire process of health care.

Documentation is necessary from a legal perspective and, more importantly, it provides better communication among member of the health care team and ultimately improves patient care (Wilkins et al, 2000, p434). For a nurse to be able to gain a close record of the patient's development the evaluation of the nursing activities is to be ongoing. Depending on the patient's problem to begin with, the nurse must evaluate the goals that were primarily set and state evidence. (Jenkins, 2003, p158).

This essay has made emphasis on the importance of a nurse's knowledge and skills in respiratory assessment. Practical guidance on history taking and physical assessment of patients with respiratory problems and the frequency and treatment of such assessment is determined by the patient's condition. It is imperative that nurses are aware of the significance of their findings derived from respiratory assessments. Close observation effective assessment and accurate documentation of patients with breathing malfunctions enable nurses to take a holistic approach to their patient and care plan.

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