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Fundamentals of chest auscultation.

Introduction.

Chest auscultation is a vital component of clinical assessment in identifying respiratory illness. Although previously considered an advanced skill aligned to more extensive examinations undertaken by senior nurses or clinicians, The Nursing and Midwifery Council's (2018a) *Standards of proficiency for registered nurses* names chest auscultation an essential competency for all nurses to achieve. This article explores the fundamental process of chest auscultation and its findings, including considerations for those practising the skill within mental health settings.

Respiratory Anatomy.

Understanding anatomy of the chest and respiratory system is vital when undertaking chest auscultation and interpreting the results (Dover 2023). The trachea extends from the mouth into the chest cavity before branching off into the left and right bronchus. Further dividing into smaller branches called bronchioles culminating in the alveoli. These structures spread throughout the lungs allowing for the exchange of oxygen and carbon dioxide to maintain homeostasis. The lungs sit within the chest cavity surrounded by pleural sacks, filled with fluid that provides lubrication to the lungs as they move (Marieb 2023). Before undertaking chest auscultation, it is important to note two anatomical features of the lungs. Firstly, the left lung is slightly smaller and only contains two lobes (the upper and lower lobe), whereas the right lung is larger and contains 3 lobes (the upper, middle, and lower lobes). Secondly the apex of each lung rises approximately 2-4cm above the clavicle in the space between the neck and collar bone (Marieb 2023). The Lungs are protected by the thoracic cage comprised of multiple structures including the sternum and 12 pairs of ribs. Posteriorly the spine and scapula also provide support and protection to the vital organs. In addition to the skeletal anatomy the thoracic cage is interlaced with a series of muscle and cartilage that allows the chest to move (Gest 2020).

Setting up the examination.

Equipment

A stethoscope is an essential piece of equipment needed to undertake chest auscultation. Ideally a stethoscope of high quality with well-fitting earpieces should be used to complete the examination (Lister 2020). A stethoscope with both a bell and a diaphragm is beneficial as this allows the user to gauge different sounds, with the bell of the stethoscope used at the apex of the lungs and the

diaphragm used on the chest (Lister 2020). However, there is some debate in literature on exactly which side of the stethoscope should be used and can depend on user preference and available resources (Robinson 2021, McGee 2022).

Environment

To undertake chest auscultation, the patient's chest will need to be exposed. The nurse will need to consider an environment that is practical enough to complete the examination and provides privacy to ensure patient dignity (NMC 2018b). Other environmental factors should be considered such as external noise, lighting and space (Bickley 2021). Universal precautions must also be observed, such as the use of good handwashing and PPE as well as the cleaning of equipment between patients (Bickley 2021). Gloves are not routinely worn during this procedure however this must be assessed on an individual basis and in line with local policies (RCN 2022).

Patient

Patient comfort and safety needs should be considered by the nurse before starting the examination (NMC 2018b). Patients should be positioned either in a chair or on the edge of a bed. This allows exposure of both the posterior and anterior portions of the chest. Where this is not possible then a patient can be examined in a bed at a 45-degree angle (Bickley 2021). Further assistance may be required in this instance to help support patients' comfort and facilitate certain parts of the examination.

The Procedure.

1. Explain the procedure and its purpose to the patient, gaining informed consent to carry out the examination (NMC 2018b).
2. Gather any PPE, additional help and equipment you may need prior to the examination, ensuring the equipment has been cleaned appropriately before starting.
3. Establish a suitable environment and make any adjustments you may need, such as moving the patient to a different location or drawing curtains to maintain dignity (NMC 2018b).
4. Follow all necessary universal precautions such as donning PPE and washing hands.

5. Position the patient in a way that allows you to carry out the examination and is comfortable for the patient.
6. Expose the patient's chest removing clothes or bed sheets so that you are able to observe the patient's chest mindful, of patient privacy and dignity.
7. Warm your stethoscope between your hands for a few minutes if necessary to aid patient comfort.
8. Insert the stethoscope into your ears with the tips facing forwards towards your nose. Ensure a seal is formed to help clarity of sound from the stethoscope and reduce background noise (McGee 2022).
9. Place your stethoscope on to the front of the chest (Anterior) using the stepladder approach (Figure 1), starting at the Apex of the right lung 2-4cm above the clavicle in the supraclavicular space (Bickley 2021).
10. Ensure that one full cycle of inspiration and expiration is completed before moving to the next point. Use the stepladder technique to ensure a systematic approach is taken. Position the stethoscope between the ribs in the intercostal spaces, listening to the transmitted sounds comparing one side of the chest with the other (Proctor 2020).
11. Complete the examination again on the back of the chest (Posterior) using the stepladder approach noting the slight variation in auscultation points (Figure 2). Ensure that the scapula are moved away from the spine to create a clear channel for the sound to transmit. This can be done by asking the patient to lean forward slightly and put their hands on their opposite shoulders.
12. Return the patient back to their most comfortable position replacing their clothes.
13. Wash your hands and clean any equipment you may have used.
14. Explain any findings to the patient and ensure to document them in the notes and escalate any concerns in line with local policy in a timely manner (NMC 2018b).

Interpreting Sounds.

When undertaking chest auscultation there are a number of sounds that can be heard, these fall into 5 broad categories; Vesicular Sounds, Crackles, Wheezes, Rubs and Stridor.

Vesicular Breathing

Vesicular sounds are the sounds of normal breathing, the sound is often described as leaves rustling in a gentle breeze (McGee 2022). These sounds are heard all over the lung fields mainly on inspiration and have a soft quality.

Crackles

Crackles, sometimes referred to as Rales are usually heard at the base of the lungs but can be evident at any site of infection. The sound is likened to the pulling apart of Velcro or the rubbing of hair (McGee 2022). Crackles are usually evident at the beginning of the inspiration cycle and disappear before the full breath is taken.

Pleural Rub

A pleural rub occurs when the pleural cavity becomes inflamed causing friction as the lungs expand and contract. A pleural rub is a continuous sound heard on inspiration and expiration and resembles the squeaking of leather or a door hinge (Robinson 2021). A pleural rub is often associated with localised pain in one place especially on inspiration (NICE 2022).

Wheezes

Wheezes can often be heard audibly before commencing chest auscultation particularly in patients with Asthma or COPD. A Wheeze is a sign of a narrowed airway with the sound caused by air forcing itself out of the lungs along the respiratory tract. It is classified as a musical sound heard mainly on expiration with the note dependant on how much of the airway is compromised. (Robinson 2021).

Stridor

Stridor can represent a respiratory emergency and is caused by a partially obstructed airway. It is classified as high-pitched noisy breathing on inspiration audible without stethoscope. On Auscultation this is usually heard around the neck and upper airways needing immediate escalation if suspected (Robinson 2021, McGee 2022).

Considerations in Mental Health Settings.

Chest auscultation is a skill generally aligned to physical care and medical practice. Although the NMC (2018a) determine that all nurses must demonstrate auscultation skills no matter the field, care should be taken to ensure patient safety and professional competency is maintained. For novice practitioners opportunities to practice and support from mentors with sufficient knowledge and skills is an essential consideration, especially in areas not normally aligned to physical health needs. This can be particularly important when escalating concerns or interpreting results, avoiding mistakes or delays in treatment. However, proficiency in chest auscultation will allow some mental health practitioners to enhance the support of their service users. Using their interpersonal knowledge of clients and established relationships they can provide care to people often alienated by physical health services tackling the significant health inequalities experienced by people with enduring mental health problems (Public Health England 2018).

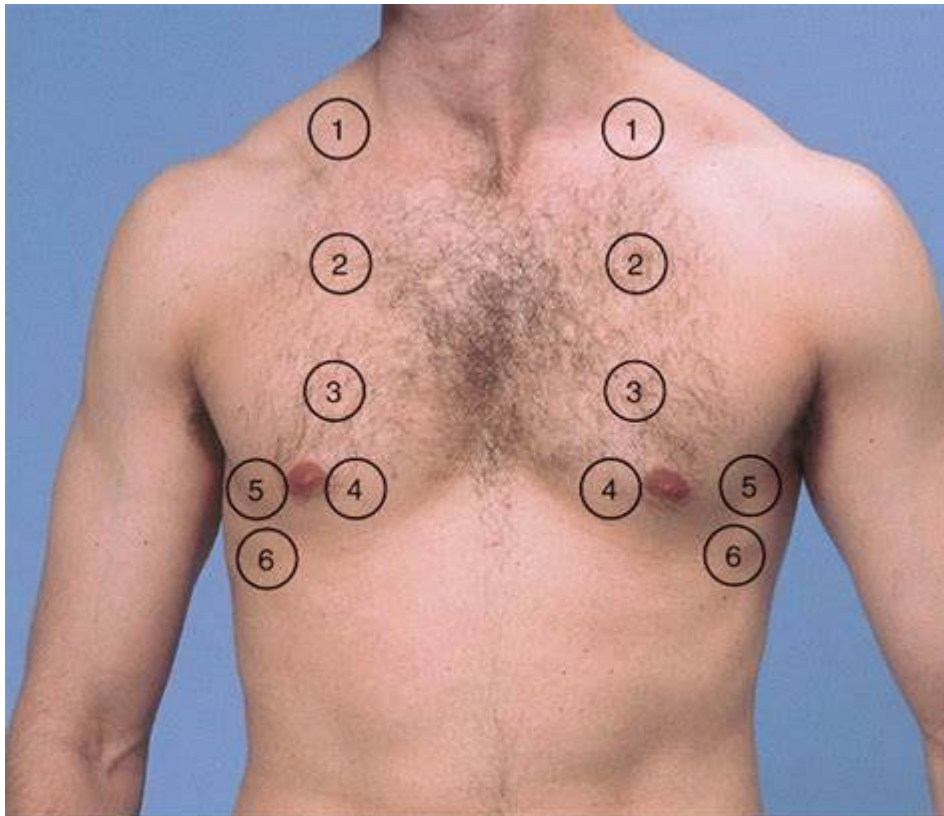
Conclusion.

Chest auscultation is a vital component of the respiratory examination and an essential competency for nurses to achieve. By using a systematic process, nurses can identify common symptoms of respiratory illness, escalating concerns, contributing to quicker diagnosis and treatment of patients.

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LOCATIONS FOR PERCUSSION AND AUSCULTATION

Fig 1

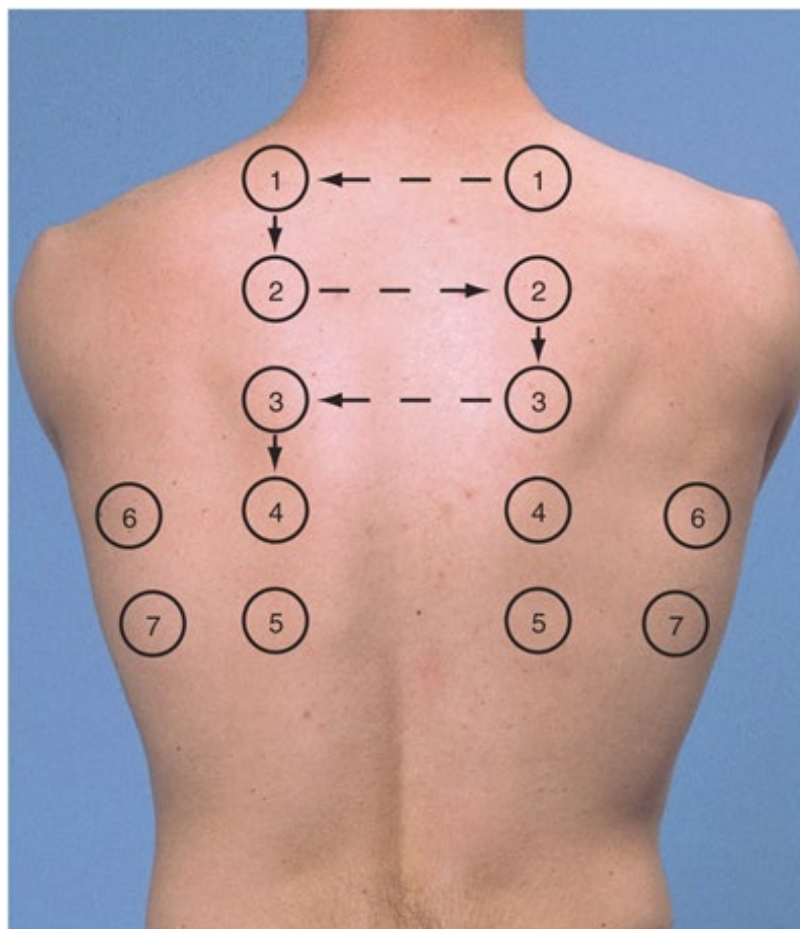


Fig 2