The process of conducting a physical assessment: a nursing perspective

Heather Baid

Abstract

Physical assessment is a new responsibility for many nurses in the UK who are expanding their parameters of advanced clinical practice. A physical assessment framework can be used by both community and acute care nurses as a guide to the process of conducting a physical assessment. The framework presented here consists of the following sequence of steps: identifying the purpose of the assessment; taking a health history; choosing a comprehensive or focused approach; and examining the patient using the sequence of inspection, palpation, percussion and auscultation. The next step, interpretation of the clinical findings, which results in either the recognition of abnormality or identification of a differential diagnosis, then becomes the basis for clinical decision making. This paper describes a comprehensive, head-to-toe assessment as one example of the application of this physical assessment framework in clinical practice.

Key words: Physical assessment ■ Framework ■ Health history ■ Clinical decision making

Nursing as a profession is expanding its parameters for practice in the UK to include comprehensive physical assessment (Rushforth et al, 1998). This move to acquire physical assessment skills has come from a variety of drivers, including the development of autonomous roles, the necessity for educational and professional growth under the new Agenda for Change structure, and nurses taking more responsibility for patient care during weekends and evenings to compensate for the reduction in out-of-hours medical coverage (Wheeldon, 2005).

Within the acute setting, practitioners whose advanced clinical practice includes physical assessment include critical care outreach teams, hospital at night teams, emergency care practitioners and clinical nurse specialists. Within the community setting, physical assessment is now a key aspect of the roles of nurse practitioners, walk-in clinic nurses and community matrons. This article will review a process of conducting a physical assessment that can be applied in both acute and community nursing practice. This process is outlined in the physical assessment framework shown in *Figure 1*.

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Health history

The nurse should begin the physical assessment by establishing an appropriate, non-judgmental environment, which will ensure privacy, comfort and patient dignity (While, 2002). An introduction and initial discussion with the patient, which includes obtaining consent, will establish a rapport and allow time for the patient to feel more at ease. Regardless of the type of clinical setting or nursing role, it is crucial for the nurse to be aware of the purpose of the assessment, which should also be made clear to the patient. Having a clear aim will allow the nurse to tailor the format of the assessment to the individual patient's clinical situation, making the assessment more effective and efficient.

A health history is one of the most important components of a physical assessment (Peacock, 2004). If the patient is unable to take part in a discussion, the health history can be obtained from other sources, such as family members or the clinical notes. The components of a thorough health history are: chief complaint, history of chief complaint, past medical history, family history, social history, and a systems review (Bickley and Szilagyi, 2003).

The information gathered during the health history will allow the nurse to decide which body systems to examine, as well as the extent of the investigation (Price et al, 2000). A focused assessment will be carried out if the health history suggests that only a specific area of the body requires examination. Alternatively, some clinical situations may require the nurse to perform a comprehensive, full body physical assessment rather than focusing on one particular system in depth. The examination sequence of inspection, palpation, percussion and auscultation may be applied to either a head-to-toe format or a body systems format (see *Table 1* for a comparison of the two formats). For the purpose of this article, the head-to-toe approach will be described to illustrate the conduct of a comprehensive physical assessment.

General survey

Inspection is the first phase of the physical examination, which in fact would have started the moment contact was made with the patient. If the patient walked into the room, gait would have been observed; if the patient was in a wheelchair or hospital bed, posture would have been noted. Listening to the patient speaking will reveal important aspects of neurological and respiratory function. During the initial inspection, attention should also be given to the overall appearance of the patient, including alertness, mood, behaviour and any signs of pain, distress or confusion (Cox, 2004). If neurological impairment is suspected, a Glasgow

Coma Scale should be completed (Lower, 2002). Temperature, pulse, respiration rate, blood pressure and oxygen saturation should be recorded.

In the general survey, the nurse should also note any abnormal fat or hair distribution, muscle wasting or asymmetrical body features. The skin should be inspected and palpated to determine colour, pigmentation, texture, turgor, temperature and moisture content (Rasmor and Brown, 2003). Any lesions, rashes or bruising should be described according to their location, distribution, pattern, colour and type.

HEENT (head, ears, eyes, nose, and throat)

Inspection of the eyes includes looking for discharge, redness or jaundice in the sclera, paleness in the lower lid conjunctiva, which would indicate anaemia, and signs of high cholesterol such as arcus senilis or xanthelasma (Cox, 2005). Both pupils should be examined for equality in size, shape, reaction to light, and accommodation. Ptosis (drooping eyelid), nystagmus (rhythmic oscillation of the eye) or an inability to track movement should also be noted (Crimlisk and Grande, 2004).

The external ears are observed for signs of discoloration or discharge. Nasal flaring or pursed lip breathing is clinically significant as a sign of respiratory dysfunction. The mucous membranes of the mouth are inspected for hydration, pallor and cyanosis, the tongue for signs of thrush or sores, and the teeth and gums for general hygiene. Looking at the throat with a light while the patient says 'aahh' will allow assessment of the tonsils, uvula and soft palate.

Neck

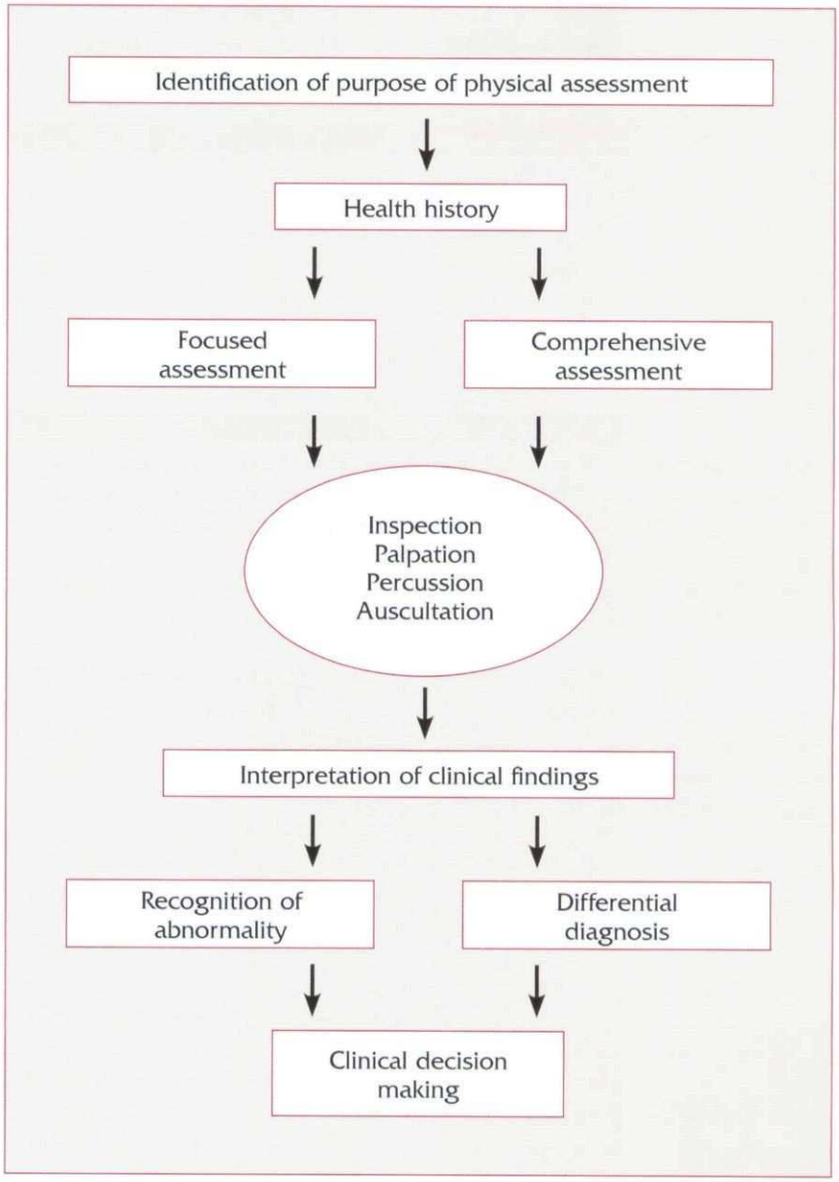
Both the front and the back of the neck should be inspected, noting any obvious masses or abnormal shape to the cervical spine. Jugular venous pressure (JVP) is estimated by measuring the height of the internal jugular pulsation above the Angle of Louis while the head of the bed is elevated to 45° (normal JVP = 2–4 cmH_20) (Gleadle, 2003). Palpation includes feeling the trachea to check that it is midline and feeling for any enlarged neck lymph nodes. Auscultation of the neck is performed using the diaphragm of the stethoscope for tracheal breath sounds and the bell to rule out any carotid bruits.

Thorax

The thorax is most easily assessed with the patient sitting on a chair or on the edge of an examination table in order to access the posterior and anterior aspects simultaneously. The posterior thorax may not be accessible if the patient is in bed or unable to sit forward, in which case the physical assessment should be adapted to the best of the practitioner's ability.

The entire thorax is inspected for shape, symmetry and scarring. Abnormalities include a barrel chest (increased anteroposterior diameter), pigeon chest (sunken sternum), funnel chest (pointed sternum) and curvatures to the spine such as kyphosis or scoliosis (Finesilver, 2003). Respirations should be assessed for regularity, rhythm, depth and work of breathing; laboured breathing will be evident from the use of accessory muscles such as the intercostal and sternomastoid muscles (Trim, 2004).

Figure 1. Physical assessment framework.



Palpation of the bony structures of the thorax should include the clavicles, sternum, ribs, spine and shoulder blades. This will allow the nurse to assess for abnormality in structure and landmark key aspects of the thorax. The nurse will also be able to determine whether there are any factors that will restrict the patient's ability to breathe. Relevant areas for palpating lymph nodes include the supraclavicular, infraclavicular and axillae (the armpits) (Epstein et al, 2003).

The point of maximal impulse (PMI) of the heart should be felt for location, intensity, regularity and size. The PMI is normally located in the fifth intercostal space in the midclavicular line, but it may be displaced laterally or into the sixth intercostal space with an enlarged heart (Jarvis, 2004). If the PMI is difficult to find, asking the patient to lean forward towards the left side will allow the heart to come closer to the chest wall. When this technique is used, the patient's position should be noted while documenting the location of the PMI. The anterior thorax should also be felt for any heaving, thrusts or palpable murmurs.

Table 1. Comparison of two formats that may be used in the comprehensive physical assessment

Head-to-toe approach
General survey
HEENT (head, ears, eyes, nose, throat)
Neck
Thorax
Abdomen
Limbs
Hands
Feet

Body systems approach
HEENT (head, ears, eyes, nose, throat)
Cardiovascular
Respiratory
Gastrointestinal
Musculoskeletal
Neurological
Renal

Respiratory excursion is measured by placing both hands firmly on the posterior chest wall around the base of the ribs, with the fingers extending around the side of the chest. With the thumbs meeting in the middle of the chest at the spine, the assessor's thumbs should symmetrically move apart at least 5 cm as the patient takes a large breath in (Dornan and O'Neill, 2003). Vocal fremitus is assessed using the ulnar surface of the hands to feel the vibration of sound transmitted through the anterior, lateral and posterior chest walls while the patient repeats the phrase 'ninety-nine' (Pruitt and Jacobs, 2005).

Percussion of the lungs normally reveals a resonant note; dullness or hyperresonance indicates abnormality (Urbano and Fedorowski, 2000). The entire lungs should be percussed from the apices (above the clavicles) to the bases, moving from one lung to the other in 5cm intervals between the intercostal spaces. After the anterior thorax has been percussed in this way, each lateral wall is percussed, followed by the posterior thorax. Dullness to the anterior lower lung fields is not a conclusive finding, because of the presence of

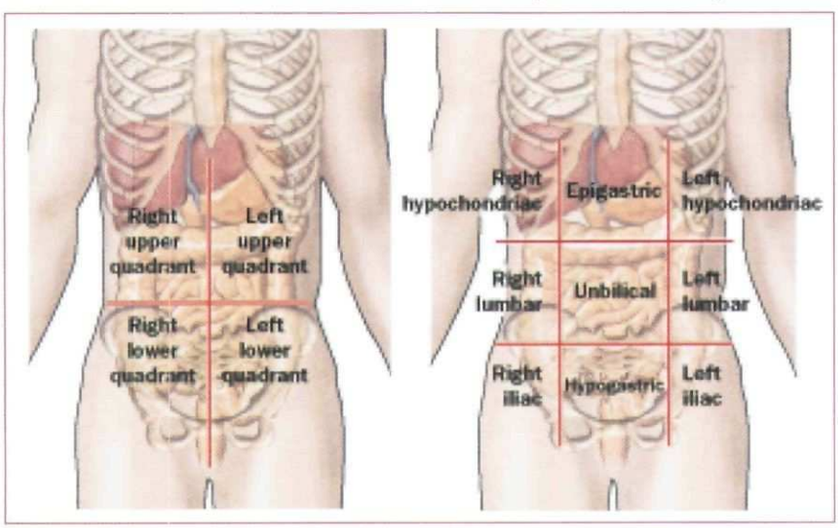


Figure 2. Left: abdomen divided into quadrants. Right: the 9 regions of the abdomen for examination.

Table 2. Auscultation sites

Auscultation site	Landmark
Aortic	2nd intercostal space, right of sternum
Pulmonic	2nd intercostal space, left of sternum
Tricuspid	4th intercostal space, left of sternum
Mitral	5th intercostal space, mid-clavicular line
Erb's point	3rd intercostal space, left of sternum

the heart on the left side and the liver on the right (Dornan and O'Neill, 2003).

Auscultation of the heart begins with the nurse listening to the apical beat at the PMI with the diaphragm of the stethoscope for a full 60seconds, in order to assess rate, regularity and synchronization with the radial pulse. Heart sounds are then assessed with both the diaphragm and the bell at sites where the valve sounds are best heard (Table 2). A helpful pneumonic for remembering the heart sound regions is Apple Pie Tastes Mmm Eee (aortic, pulmonic, tricuspid, mitral and Erb's point). In the normal heart, there are two distinct, clear heart sounds (lub-dub), which are called S1 and S2 (Northridge et al, 2003). See Table 3 for a summary of heart sounds.

The final stage of assessing the thorax is auscultation of breath sounds with the diaphragm of the stethoscope. Beginning above the clavicles, a full inspiration and expiration of the right and left lung should be auscultated, continuing down the thorax in 5cm intervals bilaterally to facilitate comparison of the two lungs. The lateral walls and posterior thorax should also be auscultated in a similar fashion. Any abnormality, such as crackles, wheeze, rub or coarseness, should be noted, including location, severity and whether it occurs during inspiration or expiration (Moore-Gillon 2002). See Tables 4 and 5 for a breakdown of normal breath sounds and the presentation of clinical problems.

Abdomen

During physical examination of the abdomen, it is useful to divide the abdomen into sections to allow accurate description of the surface location of any abnormality. These sections will also facilitate documentation and help the nurse to identify the cause of the abnormality by considering the underlying organs that fall into each abdominal section. *Figure 2* shows examples in which the abdomen has been divided into quadrants or nine regions.

Inspection of the abdomen begins with an assessment of whether the patient is able to lie flat without any pain. The abdomen should be observed from the top for shape, symmetry, striae, dilated veins and scarring, as well as from the side with tangential lighting for evidence of peristalsis or pulsations (O'Hanlon-Nichols, 1998).

In order to assess bowel sounds accurately, auscultation of the abdomen is completed before palpation or percussion. Using the diaphragm of the stethoscope, the nurse should listen to each quadrant of the abdomen until normal, gurgling bowel sounds are heard. If no sounds are heard immediately,

Table 3. Summary of the characteristics of various heart sounds

Heart sound	Stethoscope	Timing	Cause of sound	Abnormality
S1	Diaphragm and bell	Beginning of ventricular systole	Closure of mitral and tricuspid valves	Normal
S2	Diaphragm and bell	End of ventricular systole	Closure of pulmonic and aortic valves	Normal
S3	Bell	Early ventricular diastole after S2	Rapid ventricular filling: • Hypervolaemic – heart failure • Hyperkinetic – exercise, pregnancy, anxiety	Normal: children and young adults Abnormal: >35 years old
S4	Bell	Late ventricular diastole before S1	Atrial contraction against non-compliant ventricle: Myocardial infarction, aortic stenosis, hypertension	Normal: infants and children Abnormal: adults
Murmurs	Diaphragm and bell	Systolic: heard between S1 and S2 Diastolic: heard between S2 and S1	• Valve is stiff: stenosis • Valve doesn't fully close: regurgitation • Increased velocity of blood: anaemia, hyperthyroid • Septal defect	Graded according to severity (1–6) Innocent murmurs common in children and young adults

auscultation should continue for at least 5 minutes (Solomon and Wilson, 2002). Other abnormalities include hypoactive, hyperactive or high-pitched tinkling sounds. Finally, bruits can be ruled out using the bell of the diaphragm in the aortic, renal and iliac regions.

Palpation of the abdomen involves light palpation of all nine abdominal regions, followed by deep palpation, feeling for any masses or associated pain. If the patient describes abdominal pain, leave the affected area until last, noting any guarding or rebound tenderness. If a mass is identified, note the location, size, shape, consistency and presence of tenderness or pulsations. The liver and spleen are not palpable in a normal patient, but may be felt if they are enlarged.

Percussion of all nine abdominal regions in a normal abdomen produce a hollow, tympanic sound because of the presence of gas in the abdomen, whereas percussion of fluid, masses or solid organs will result in an abnormal, dull percussion note (Urbano and Fedorowski, 2000). The edges of an enlarged liver or spleen can be estimated by percussing dullness to the right hypochondriac region for the liver and the left hypochondriac region for the spleen. Testing for renal tenderness involves striking the ulnar surface of a fist against the other hand, which is placed on the costovertebral angle.

Limbs

Any problems with the musculoskeletal system will generally have been highlighted during the course of examining the other systems, in terms of pain, stiffness or immobility. If a musculoskeletal problem is suspected, the joint affected as well as the joint above and below can be assessed by using the sequence of 'look, feel, move' (Gale and Roper, 2005):

- Look at the affected area for redness, swelling, muscle atrophy, bruising, lesions and symmetry with the unaffected side.
- Feel the joint and surrounding areas for tenderness, numbness, warmth, effusion or crepitation.
- Active or passive movement allows assessment of the range of motion of the relevant joints.

With the patient relaxed, muscle tone is assessed by passively flexing and extending the elbow of each arm and the knee of each leg. Muscle tone is assessed by passively flexing and extending the elbow of each arm and the knee of each leg. Even when fully relaxed, muscles normally maintain a minimal amount of contraction which is referred to as 'tonicity'. Normal tone may be difficult for the inexperienced examiner to identify and articulate, however, abnormal tone is quite obvious to recognize. An increase in tone presents as spasticity or rigidity and a decrease in tone presents as flaccidity (Swash 2002). A general survey of power can be performed by asking the patient to resist elbow flexion, elbow extension, knee flexion, knee extension, plantar flexion and dorsiflexion.

Hands

Clinical signs of perfusion can be detected by assessing colour, warmth, movement and sensation in the hands. Adequate peripheral perfusion is also recognized by the presence of a strong radial pulse and capillary refill in the fingernail bed of less than 3 seconds. While inspecting the fingernails,

Table 4. Characteristics of normal breath sounds

Normal breath sound	Duration of insp:exp	Intensity	Pitch	Location
Tracheal	I < E	Very loud	High/harsh	Trachea
Bronchial	I < E	Loud	High	Manubrium
Bronchiovesicular	I = E	Medium	Medium	Below clavicles, between scapulae
Vesicular	I > E	Soft	Low	Areas of lung tissue

Table 5. Presentation of clinical problems

Clinical problem	Trachea	Vocal fremitus	Percussion note	Breath sounds
Effusion	Away	Decreased	Stony dull	Decreased
Consolidation	Central	Increased	Dull	Bronchial
Collapse	To lesion	Decreased	Dull	Decreased
Pneumothorax	Away	Decreased	Hyperresonant	Absent

the nurse should note any abnormalities such as clubbing, koilonychia, leukonychia, and splinter haemorrages (Bevan and Gawkrodger, 2005). Asking the patient to squeeze two fingers in each hand will allow the nurse to assess the patient's ability to follow commands and compare strength between the right and left hands.

Feet

Like the hands, the feet should be assessed for colour, warmth, movement, sensation, capillary refill and the presence of strong peripheral pulses, as well as for signs of oedema. If the dorsalis pedis and posterial tibial pulses are weak or absent, the popliteal and femoral pulses can be felt to detect abnormalities in circulation.

Other

Depending on the information gathered from the health history and whether any abnormality was found during the general survey, the nurse may choose to incorporate other areas of the body into the physical examination. Further assessment may include the cranial nerves, fundoscopy, breasts, pelvic or rectal examination, inner ear, reflexes or a detailed mental health assessment.

Conclusion

Conducting a physical assessment by taking a health history and then applying the sequence of inspection, palpation, percussion and auscultation to areas of the body in a head-to-toe manner allows a broad physical assessment to be structured and organized. This systematic approach will help the nurse to summarize and document the clinical findings of the examination. Interpretation of the significance of the clinical findings will result in either the recognition of abnormality or identification of a differential diagnosis, depending on the skill of the nurse carrying out the physical assessment. Clinical decision making and the ability to act upon the assessment findings will also depend on the context of the nursing practice. Some nurses will recognize the abnormality and refer the patient onto another member of the healthcare team, while those working as advanced clinical practitioners will have the necessary knowledge base and professional responsibility to act independently on their differential diagnosis.

With the expansion of advanced nursing practice and an increase in responsibility for both community and acute nursing roles in the UK, physical assessment is becoming a necessary aspect of senior nursing roles. Physical assessment skills will also benefit junior nurses by enabling them to recognize clinical problems sooner and to enhance the information being communicated to doctors or other healthcare professionals when making referrals. An appreciation of the value of having a systematic framework for conducting a physical assessment will prove fundamental to any nurse incorporating physical assessment into his/her clinical practice. BJN

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KEY POINTS

- Nursing roles within the UK, in both the community and acute settings, are expanding to include physical assessment skills.
- A framework for conducting a physical assessment using a systematic approach is presented.
- A thorough health history will guide the physical assessment as well as contribute to clinical decision making.
- The physical assessment uses the sequence of inspection, palpation, percussion and auscultation; interpretation of the findings results in either the recognition of abnormality or a differential diagnosis.

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