Improving the assessment of ankle brachial pressure index (ABPI) in practice: a crucial element of holistic assessment

KEY WORDS
- Patient engagement
- Patient expectations
- Patient involvement

The Wounds UK Best Practice Statement 'Ankle brachial pressure index (ABPI) in practice' emphasises the role and importance of ABPI, whilst addressing its challenges, along with sharing its successful implementation in practice. Each 'Patient Expectation' listed below indicates what the patient should expect when ABPI testing is being carried out, along with rationale, providing the patient with clear and concise information on why the process is being conducted, how it relates to the patient and why treatment is tailored to each individual so that accurate assessment can be achieved.

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The use of the ankle brachial pressure index (ABPI) in practice has been identified as a fundamental aspect of holistic assessment for patients with lower limb wounds, leading to early intervention, and is therefore vital in the improvement of patient outcomes. The new Wounds UK Best Practice Statement 'Ankle brachial pressure index (ABPI) in practice' (Wounds UK, 2019) emphasises the role and importance of ABPI, whilst addressing challenges, along with sharing its successful implementation in practice.

The document aims to support best practice and, by clearly articulating the processes required to achieve this, it is anticipated that the information may be used to bid for increased support for practitioners pursuing organisational changes — essential in the delivery of ABPI testing.

ABPI is a non-invasive way of assessing a patient's vascular status and identifying the presence of peripheral arterial disease (PAD). The traditional means of conducting ABPI testing is by using a handheld Dopplerprobe, hence this testing is also referred to as 'Doppler' testing. If PAD is confirmed, appropriate treatment and referral can be made, significantly reducing both morbidity and mortality, which is why accurate assessment and early intervention must be considered crucial, especially in driving the development of patient outcomes and service improvement.

The 'Doppler' measurement entails an analogue occlusion cuff being placed on each extremity, one at a time, while using a handheld Dopplerprobe to detect the blood flow. The ABPI is then calculated manually, comparing the systolic blood pressures in the legs and the arm. MESI ABPI MD utilises plethysmography to measure the change in the artery's volume, offering automatic interpretation of obtained pulse waveforms through the PADsense™ algorithm. Ultimately, the purpose of all ABPI testing is to assess the strength of the arterial blood flow at the ankle and consequently determining, whether the patient is deemed safe for compression therapy to be applied.

It is imperative that all patients with a lower limb wound — but particularly a leg ulcer — undergo ABPI testing as part of their holistic assessment, along with patients considered at high risk of diabetes/immobility or presenting with lower limb-related changes (*Box 1*). Assessing arterial flow should also be considered in patients with or at risk of heel pressure ulcers.

There are several advantages of using automated ABPI testing in practice. One of which is that automated testing creates a time-saving element, with the process being significantly quicker and simpler in practice than handheld doppler (Mullings, 2018) as an accurate reading is produced within 1 minute. The simple nature of the device means only one member of staff

Box 1. List of patients who should be tested for PAD.

- Patients with stigmata of disease in the absence of ulceration, in order to halt progression and initiate early intervention
- Patients with any symptoms of PAD, in order to confirm or exclude disease
- Patients with early or established swelling of the lower limb, to inform treatment choices and instigate early intervention to halt disease progression and complications
- Falls and syncope patients prior to treatment with compression hosiery
- Patients undergoing compression therapy prior to being issued with repeat garments, with frequency based on individual risk factors associated with the patient
- Any patient with a lower limb wound irrespective of suspected aetiology to assess for sub-clinical PAD, which may then affect the patient's healing potential and suggest onward referral

is required to carry out the reading, further releasing staff time and resources. There is no requirement for staff to calculate results as this is completed automatically by the machine — thus reducing human errors. The device is also lightweight (600 g), portable and battery-powered, allowing suitable use in most care settings, including visits into the community.

Other advantages of this device include:

- Increased accuracy of results (Mullings, 2018)
- Facilitating early detection of PAD
- Simplifies the testing processes
- Increases the confidence of clinicians by improving patient outcomes.

Patient expectation statements are included in this document in order to emphasise the importance of patient involvement, with the overall objective of improving patient outcomes in practice. Please find below each patient expectation and a more detailed rationale of each statement:

PATIENT EXPECTATION 1

If you have, or are at risk of a lower leg wound, you should expect to receive ABPI testing within 4 weeks or sooner

Patient Expectation

For the patient:

Any patient with or at risk of a lower limb wound, regardless of its duration, should receive treatment as soon as possible following holistic assessment. ABPI testing must be recorded as part of a holistic assessment of all patients deemed to require compression therapy. This testing is an important element of determining the underlying problem in relation to the wound that may have occurred and also in identifying those who are at high risk of breakdown and delayed healing. The timing of the test is important as failure to undertake the test may mean patient's do not receive the most appropriate treatment.

PATIENT EXPECTATION 2

The clinician will explain to you how this test relates to your medical history and current condition, and how this may influence your treatment

Patient Expectation

For the patient:

The test is usually used to confirm what the clinicians believes is wrong with the patient based on medical history and examination of the patient's limb. Certain factors including diseases such as diabetes and cardiac disease increase the risk of poor circulation. The patient will also be asked about family history and when and how the wound occurred. General health conditions, such as factors relating to a specific limb or wound condition may cause issues when conducting ABPI testing, particularly when pain is experienced or swelling/oedema is identified as being present. Medical factors may also affect the patient's ability to undergo ABPI testing, these include: deep vein thrombosis (DVT), cellulitis,

Table 1. Comparison between MESI ABPI MD and other methods

	Doppler probe	MESI ABPI MD	MESI ABPI MD rationale
Measurement duration	30 min	1 min	Plethysmographic method
Pre-measurement resting	10–20 min	0 min	Elimination of blood pressure drift error and time-savings
Measuring process	One extremity at a time	Simultaneous	
Additional education	Yes	No	Medical staff familiar with the cuffs
Calculations	Manually	Automatic	Instant left and right ABPI and more accuracy
Measurement report	No	Automatic PC	For patient records
Clothes removal	Yes	No	Increased patient comfort
Gel appliance	Yes	No	

surgery to arm/leg, lymph node clearance, cancer-related treatment, amputation, friable skin, mental health-related issues, dementia or neurological disease (may affect your ability to remain still).

PATIENT EXPECTATION 3

The clinician will explain to you why you need to lie down during the procedure and will make sure you are as comfortable as possible

Patient Expectation

For the patient:

The environment in which ABPI testing is carried out can have an effect on the outcome of the assessment or test. The patient will need to lie flat and remain still for at least 1 minute in order for the reading to be accurate and the machine to detect the signal it needs for an accurate reading. It is important for the patient to communicate, when necessary, if they are feeling uncomfortable and to ask questions if they feel the process of the ABPI testing has not been explained properly to them. If they need the toilet, are cold or in pain or know they will have difficulty remaining flat or keeping still they should make sure that the clinician undertaking the test is aware and that they do what they can to help the patient.

PATIENT EXPECTATION 4

As best practice care, you will receive access to diagnostic technology that will facilitate accurate assessment, diagnosis and ongoing treatment

Patient Expectation

For the patient:

The results of the ABPI testing should be used by the healthcare practitioner to initiate the most appropriate treatment plan for the patient, or where necessary to make a further referral to a specialist — usually a hospital consultant. The results can be printed out and forwarded to the specialist, so they understand why the patient has been referred and can see the results of the test.

AUTOMATED ABPI: SUCCESSFUL IMPLEMENTATION

In 2018, Dowsett and Taylor carried out a quality improvement project which focused on improving assessment and management of venous leg ulcers in housebound patients, receiving care from the community nursing service. This was as a result of recent evidence suggesting that patients with venous leg ulcers receive care that is not always effective or most efficient — resulting in prolonged ulceration, affecting both quality of life and ability to conduct daily activities. This project recognised

Table 2. Comparison between MESI ABPI MD and other methods				
Date	**Leg ulcer assessment complete**	**ABPI measured (current)**	**Receiving compression therapy**	**Care plan reviewed in the last 4 weeks**
Baseline data	50%	50% (handheld Doppler)	50%	20%
November 2017	100%	100% (MESI available)	100%	35–100%
April 2018	100%	100% (MESI avaialble)	100%	88%
July 2018	100%	100% (MESI available)	100%	90%

a lack of time and confidence to undertake ABPI assessments as a key challenge in care delivery.

To address this issue, ABPI MESI MD devices were obtained for the teams involved and training provided on their use, giving the team the capacity to see a larger number of patients in a shorter space of time. See *Table 1* for more information on the comparisons between the MESI device and traditional Doppler testing methods. The leg ulcer link nurse group were also supported by the tissue viability team in order to enhance their knowledge and competency in leg ulcer care. Thus, use of the MESI device led to accurate identification of patients with PAD, for appropriate referral to then be made to vascular services.

This project was found to have had a positive influence on clinical staff in feeling supported in practice, able to apply their own skills and knowledge, with relevant resources available such as time, staff and equipment in order to support the practice of ABPI testing.

Table 2 shows the projects baseline data, along with the improvements achieved during implementation.

The implementation of ABPI devices has shown to be successful in creating a positive impact on patients, clinicians and healthcare systems. For future use of automated systems in practice, it is suggested that guidance be given on initial education and training, in order to optimise its execution in practice. WUK

REFERENCES

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