

Comparative Breathability of Various Two Layer Compression Bandages Available in the United States: Does Breathability Differences Exist, and Does It Matter?

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INTRODUCTION

The definitive treatment of venous ulceration is the use of compression bandages. As a matter of increasing trend, the use of four layer bandages of the past is being replaced by the use of two layer bandages, largely for the reasons of convenience. Particularly in hot climates, the bandages are worn with low compliance due to patient discomfort and a feeling of occlusiveness/ constriction. Quite possibly, breathability of the construct is an important patient compliance factor, impacting healing. We measured breathability under standard conditions of four bandages commercially available in the US, including a Dual Compression System (DCS), Bandage 1 in our study, which combines two engineered fabrics, with one short stretch and one long stretch bandage in the same kit, both printed with visual stretch indicators, that is highly evidence based (clinical)1-8. The visual indicators (ovals that turn into circles when the correct stretch is applied to them) ensure that the correct therapeutic pressure is applied if instructions are followed.

METHODS

We included four bandages as shown in the footnotes, Bandage systems 1-4, which all come in a “regular version” and a “Lite version”, in our study. We used the method NF EN ISO 9237:1995 (Textiles — Determination of the permeability of fabrics to air). It describes a method for measuring the permeability of fabrics to air. In this method, an air flow rate through a specific area with a specific air pressure is measured. The equipment directly measures the permeability of the sample, i.e. the difference air pressure difference observed across the sample. (Figure 1). 10 samples were tested per bandage.

AIR PERMEABILITY	(L/M ² /S)
Bandage 1	467
Bandage 1 Lite	381
Bandage 2	330
Bandage 2 Lite	348
Bandage 3	272
Bandage 3 Lite	84
Bandage 4	697
Bandage 4 Lite	822

TABLE 1



FIGURE 1

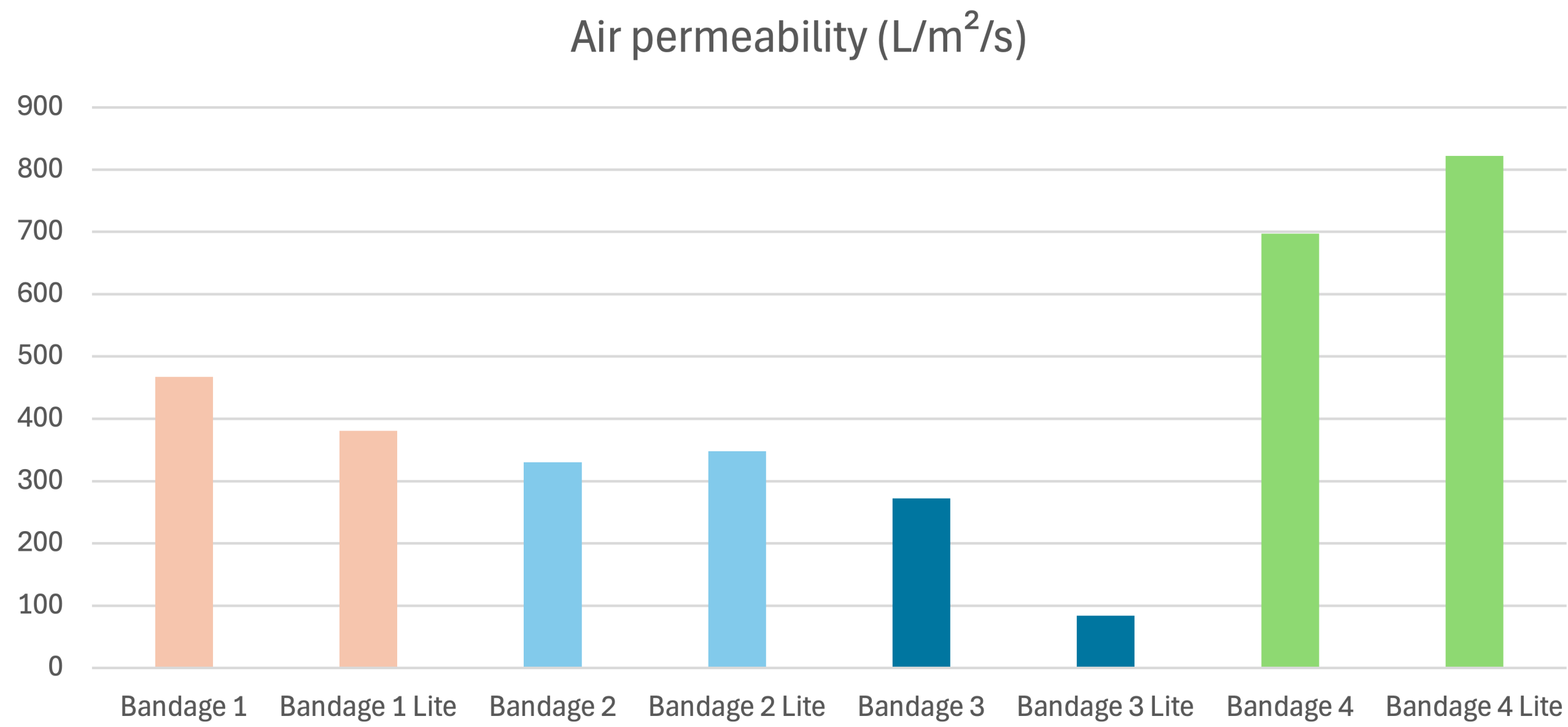


FIGURE 2

RESULTS

The bandages were tested after application to the test rig (Figure 1) according to instructions of each product. The results (Table 1, Figure 2) showed wide differences in breathabilities in the units of liter/square meter/second. The breathability values for the “Regular” ranges, varied from a value of 272 for a popular short stretch bandage product (Bandage 3) to 822 for the DCS, an almost threefold difference (Bandage 4). Table 1 shows the difference in the breathability factors where Bandage 4 clearly is the most breathable in both the “regular” and the “Lite” ranges tested.

DISCUSSION

Clothing, and thus likely bandage wear comfort is highly related to breathability9. Recent launch of the DCS (Bandage 4) in the US has shown high patient/clinician preference for it within users of other compression systems established for longer periods in the USA, such as Bandage 3 which had the lease value of breathability (Bandage 3). The reasons for this preference of Bandage 4 over Bandage 3 amongst those to who Bandage 4 has been introduced are not completely understood, though patient comfort and the resulting wear compliance has been stated by clinicians choosing the DCS (Bandage 4) over other bandages. It is possible that this high degree of breathability leads to higher patient comfort, and thus patient compliance, and therefore clinician adoption who prefer to see high compliance rates within their patient population.

The visual indicators also make application easier and the clinician more confident in application. More research on how comfort drives bandage wear compliance is indicated. A recent research poster, for example shows that this DCS product can be worn with comfort in highly tropical, hot, and humid environment, in Cairo, Egypt.

BANDAGE 1 SYSTEM: AccuWrap™ and Accuwrap™ Lite, Medline Industries, North America
BANDAGE 2 SYSTEM: TwoPress® 2 and TwoPress® 2 Lite, Hartmann, North America
BANDAGE 3 SYSTEM: **Coban™ 2 and Coban™ 2® Lite, Solventum, North America
BANDAGE 4 SYSTEM: UrgoK2®, and UrgoK2® Lite Urgo Medical North America

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*UrgoK2, Urgo Medical North America
Created with the support of Urgo Medical North America, Fort Worth TX.