AN INNOVATIVE COMPRESSION SYSTEM PROVIDING LOW, SUSTAINED RESTING PRESSURE AND HIGH, EFFICIENT WORKING PRESSURE

Presenter: Josefin Damm, CEO, Co-founder & Co-inventor, PressCise AB, Sweden

Co-authors: T. Lundh, H. Partsch and G. Mosti

Conflict of interest to declare

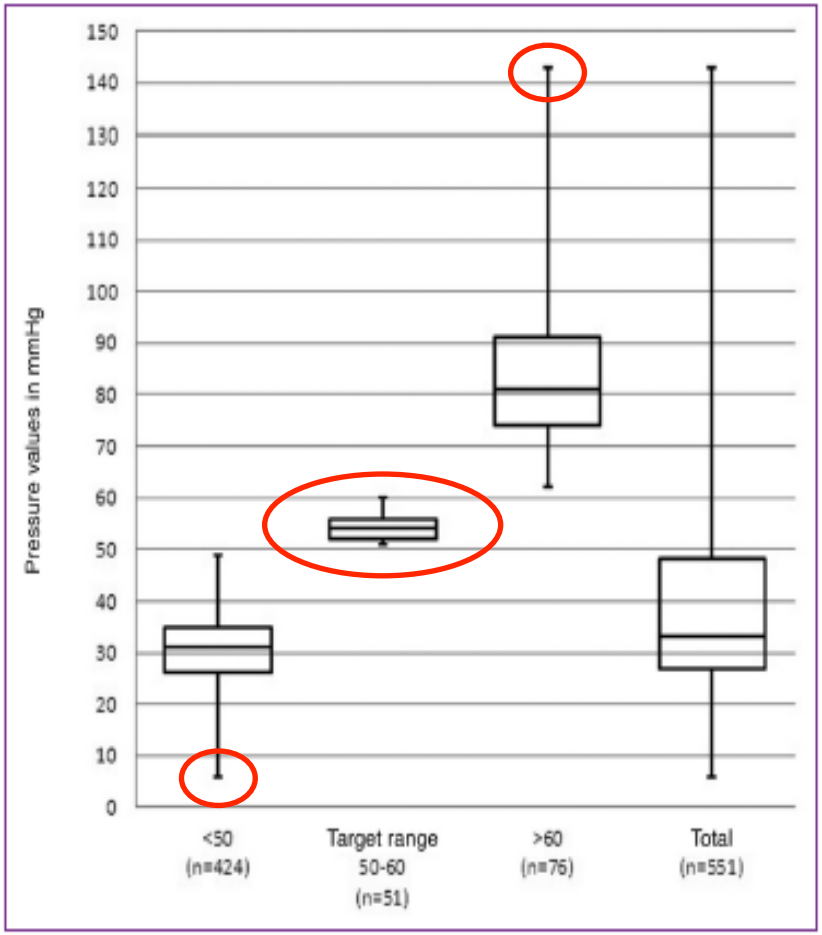
Josefin Damm is CEO, Co-founder & Co-inventor
PressCise AB

Torbjörn Lundh is co-founder & co-inventor at PressCise AB

Optimal compression?

No consistency of pressure

- Less than 10% reached the target pressure
- Pressures between 6 and 143 mmHg



Protz K et al. Compression therapy: scientific background and practical applications. JDDG 2014 794-801

Quantified compression treatment

Two components

Pre-defined pressure

Lundatex® medical

Stiffness

Lundatex® system

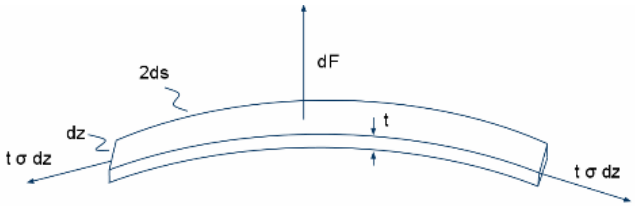
1st – apply a precise pressure

Lundatex® medical

- ✓ Well-defined pressure – invariant of applier & leg shape
- ✓ Elastic and conformable – no pressure change during movement
- ✓ Safe and low pressure – 20 mmHg
- ✓ Possible to design different pressure levels

Laplace

(1749–1827)



$$\Downarrow$$

$$\mathrm{d}\mathbf{F} = -\sigma\,\mathrm{d}z\,t\left(\frac{\mathbf{r}''(s-ds)}{|\mathbf{r}''(s-ds)|} - \frac{\mathbf{r}''(s+ds)}{|\mathbf{r}''(s+ds)|}\right)\cdot\frac{\mathbf{r}''(s)}{|\mathbf{r}''(s)|}$$

$$\Downarrow$$

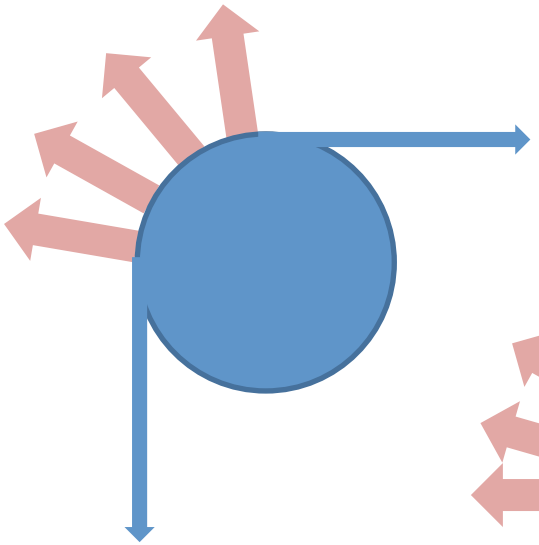
$$p = \sigma t \kappa$$

Bandage based on Laplace's law

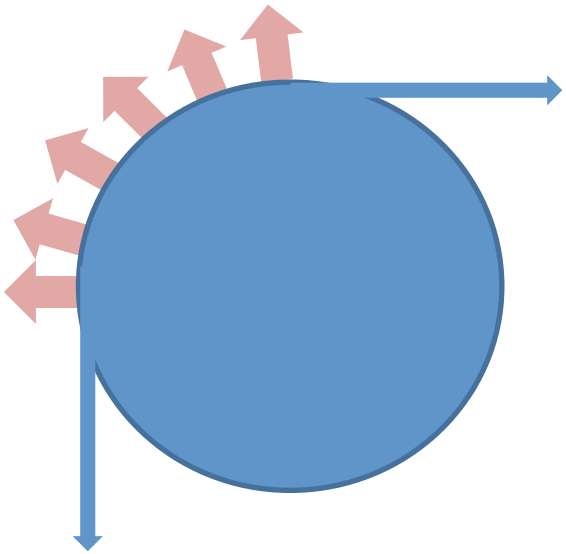
Pressure = force × overlap × curvature

At a constant force the pressure gets…

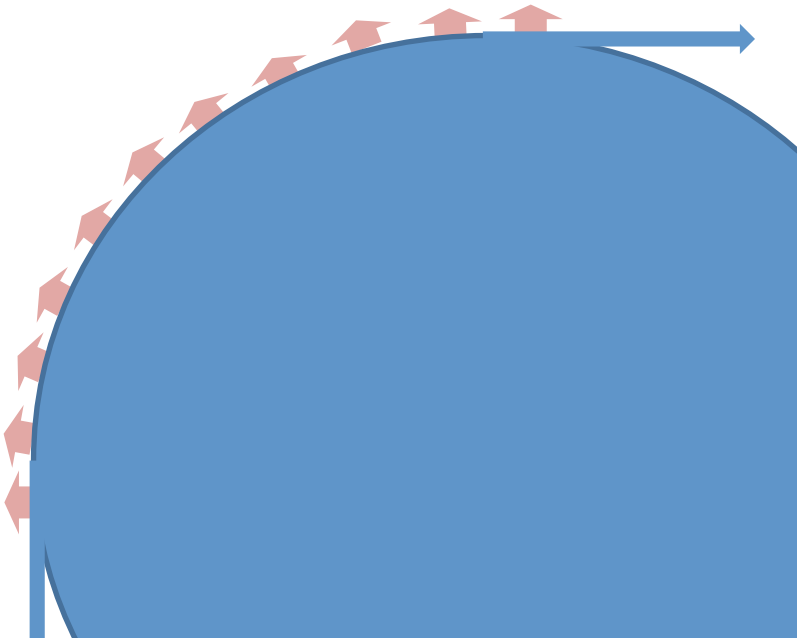
high at sharp curvature



less at less curvature



low at small curvature

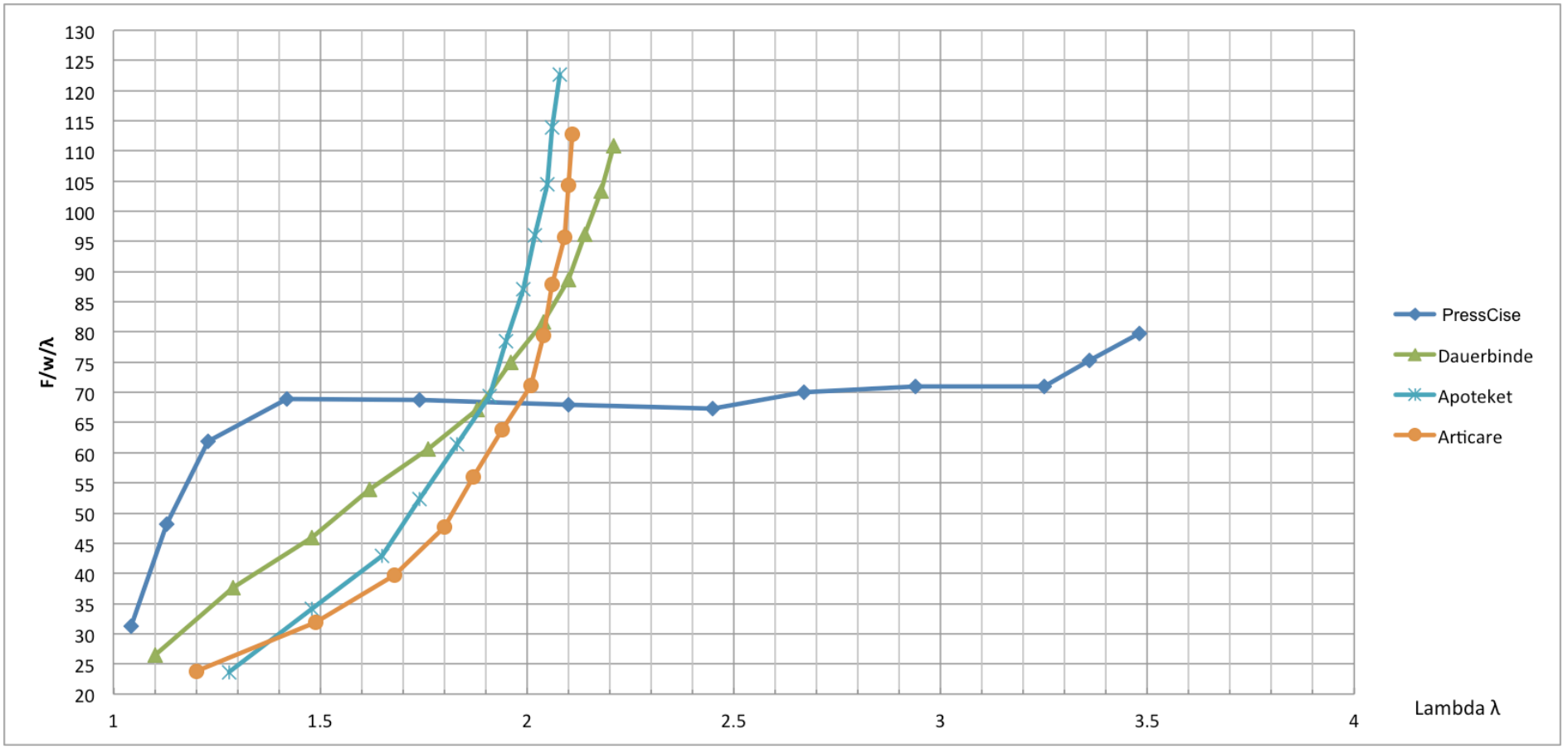


The force is adjusted to the changes in curvature when the guidelines are followed

✓ Result: Same well-defined pressure everywhere

Lundatex® medical

With unique elastic properties, force and curvature work together



ORIGINAL ARTICLE

An investigation of the ability to produce a defined 'target pressure' using the PressCise compression bandage

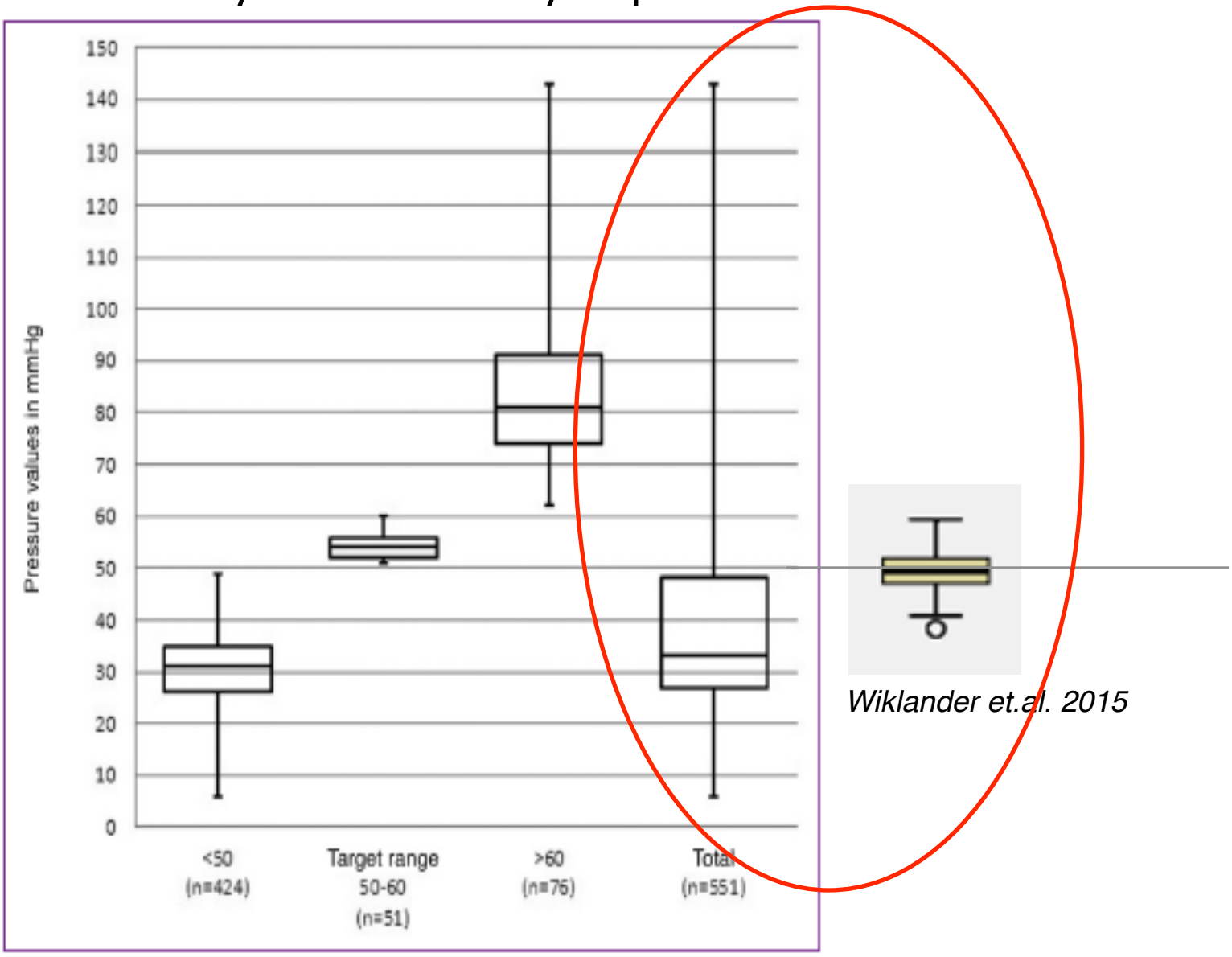
Kerstin Wiklander[1], Annette Erichsen Andersson[2] & Ulrika Källman[3,4]

International Wound Journal, October 2015

"The results show that for each 95% confidence intervals, independent of state and position, we get at most 5 mmHg from the target pressure"

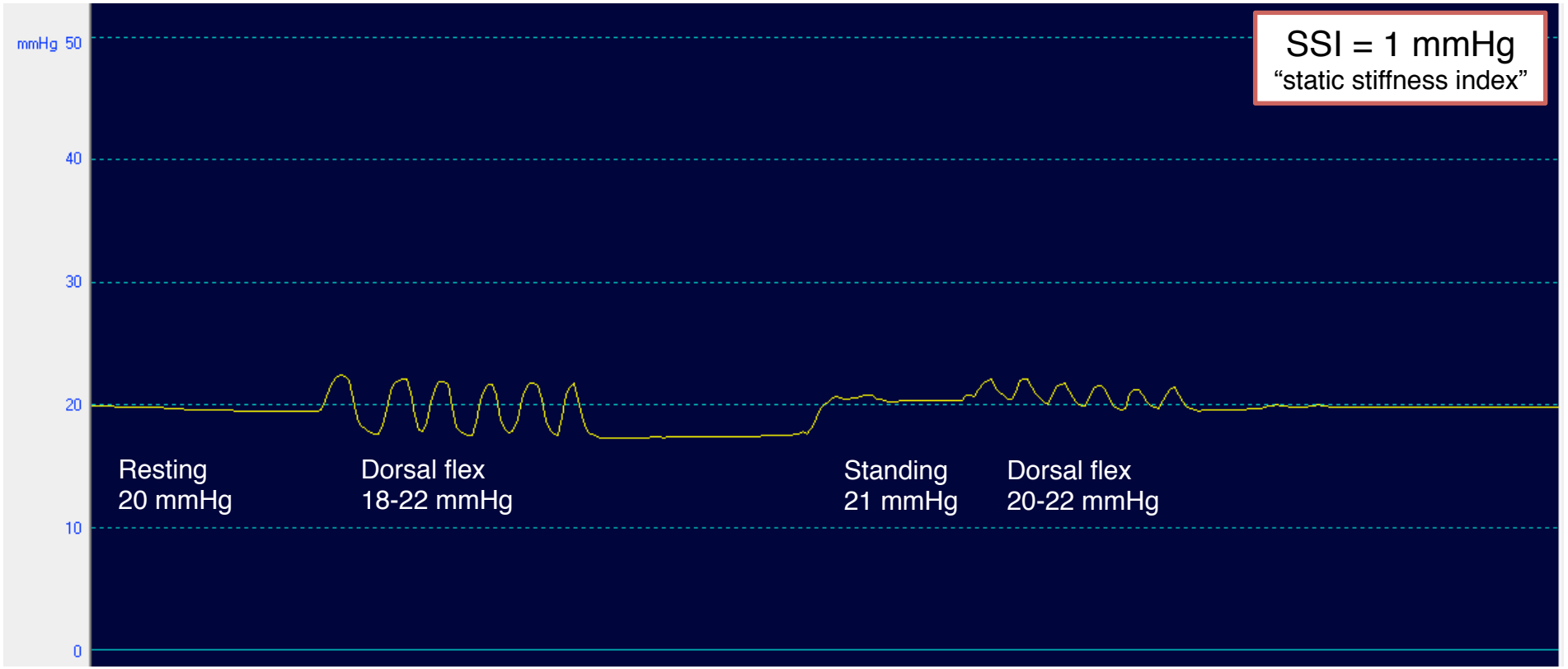
- ✓ 21 nurses
- ✓ Different experience
- ✓ First time they used the bandage
- ✓ Pre-defined bandage pressure 50 mmHg

No consistency vs consistency of pressure



Wiklander et.al. 2015

The pressure is precise, however – the stiffness is very low…



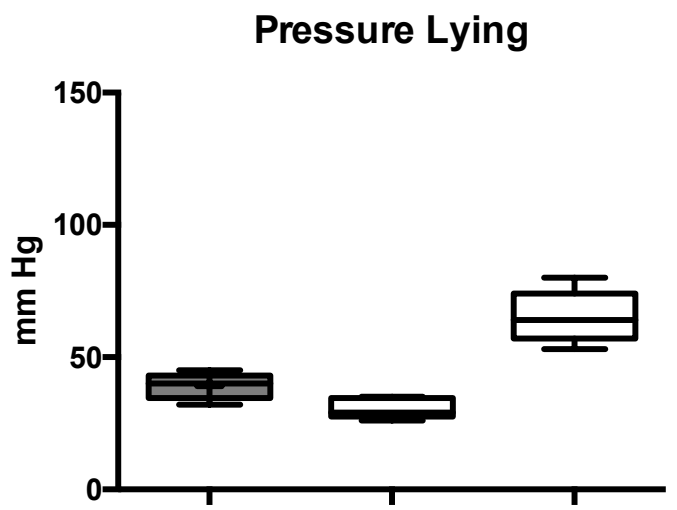
Dynamic measurement made with Picopress, Microlab Italia.

2nd – apply stiffness

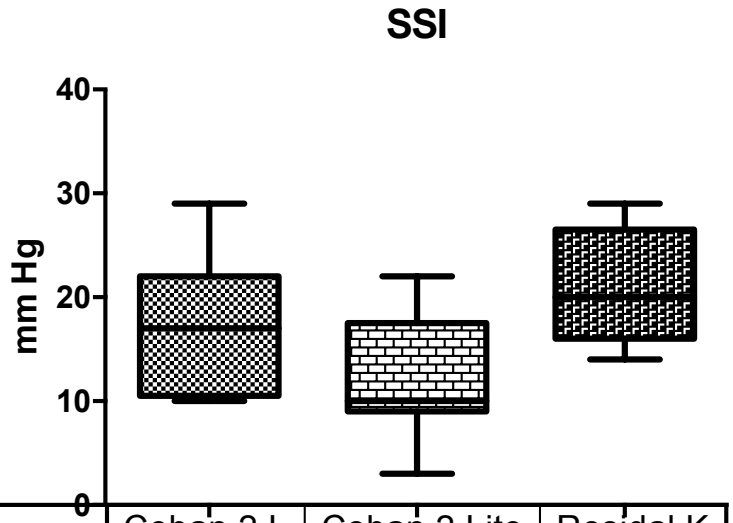
- To increase the stiffness it is usually necessary to increase the baseline pressure, using stiff bandages

Picture borrowed from http://www.smith-nephew.com

Resting pressure and stiffness today



	Coban 2 L	Coban 2 Lite	Rosidal K
Minimum	32.00	26.00	53.00
25% Percentile	34.50	27.50	57.00
Median	40.00	29.00	64.00
75% Percentile	43.00	34.50	74.00
Maximum	45.00	35.00	80.00



	Coban 2 L	Coban 2 Lite	Rosidal K
Minimum	10.00	3.000	14.00
25% Percentile	10.50	9.000	16.00
Median	17.00	10.00	20.00
75% Percentile	22.00	17.50	26.50
Maximum	29.00	22.00	29.00

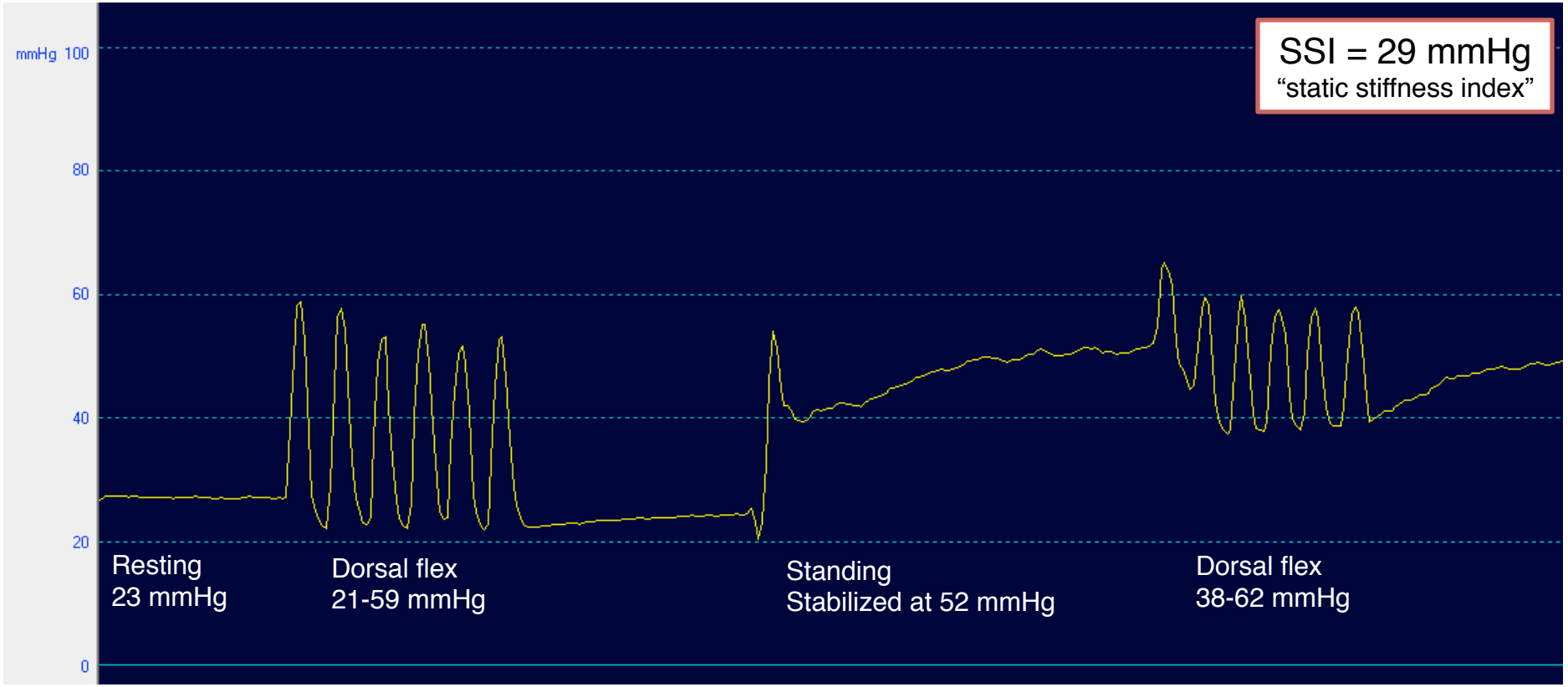
- Large variance
- Not very comfortable nor safe resting pressures

- Large variance of SSI (static stiffness index)

A novel material & method that doesn't change the resting pressure

- ✓ Patches of Velcro® are attached directly to the bandage, without adding any force
- ✓ The resting pressure stays unchanged
- ✓ The patches creates a ridged and stiff "shell" around the bandage
- ✓ At working or standing position the pressure is dramatically increased
- ✓ Easy pressure maintenance over time

The patches does not increase the resting pressure, but increases the standing and working pressure

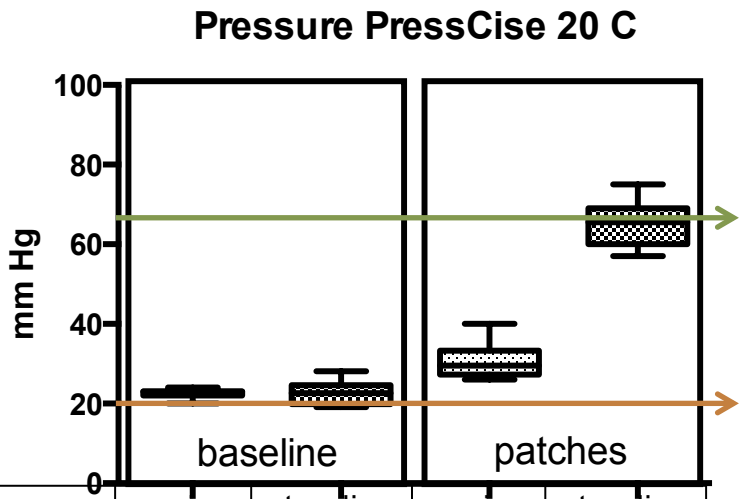


Dynamic measurement made with Picopress, Microlab Italia.

Pilot study – pressure measurement

Prof. Mosti & Prof. Partsch, Lucca, Italy

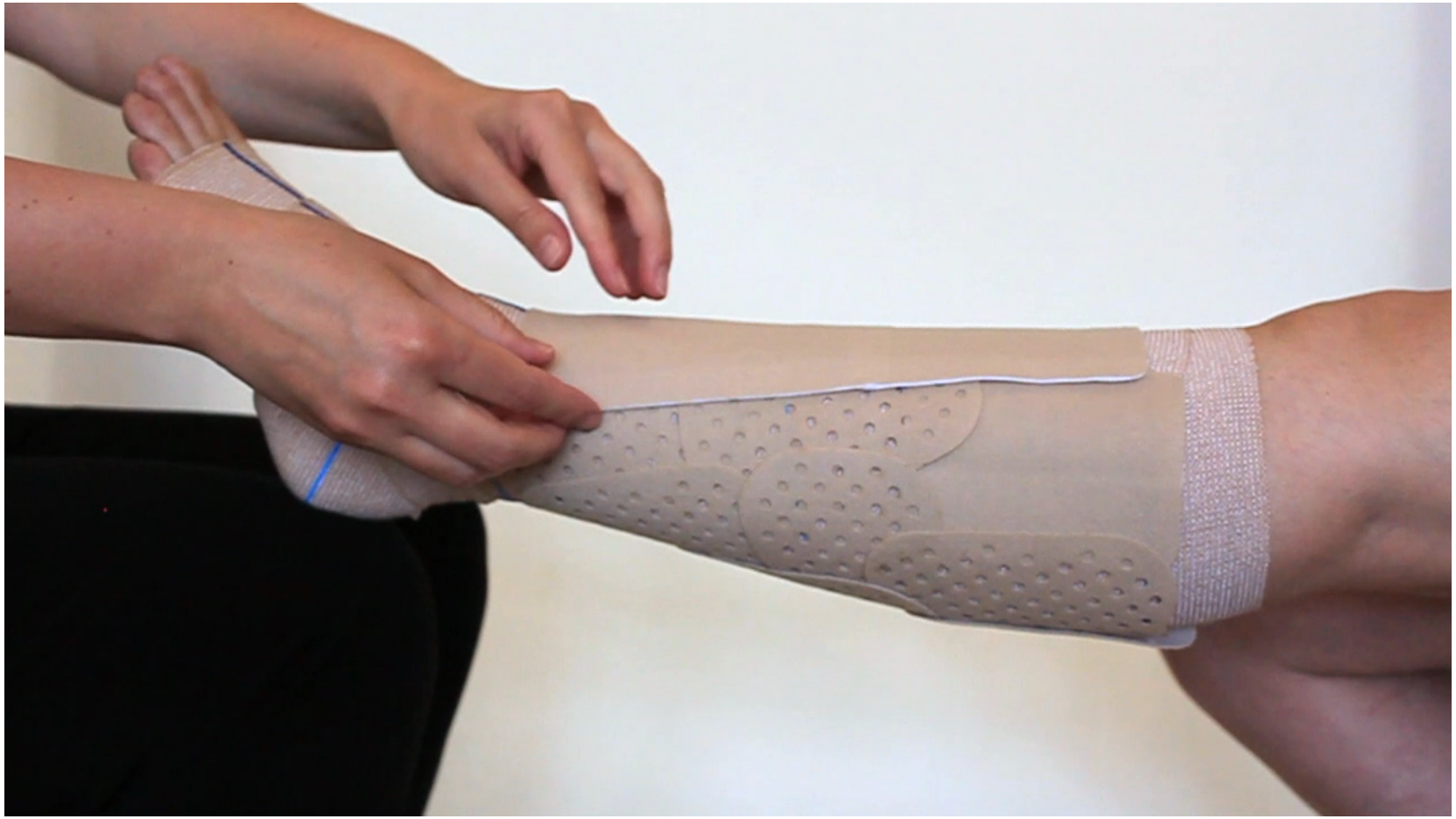
Baseline:
The bandage provides a precise pressure in both resting (supine) and standing position.



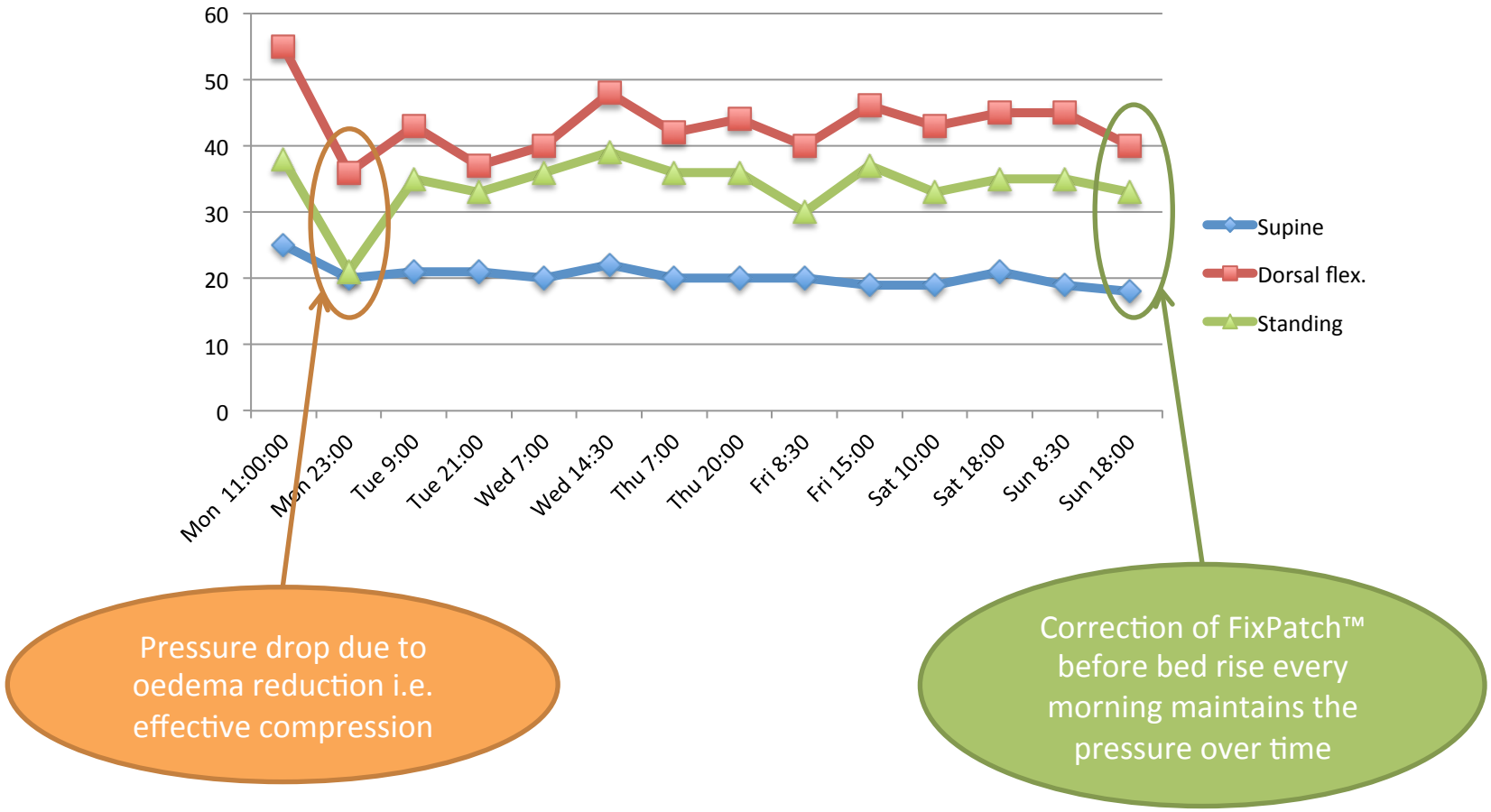
Patches:
Adding patches increases working pressure but keeps resting (supine) pressure low.

	supine	standing	supine	standing
Minimum	20.00	19.00	26.00	57.00
25% Percentile	22.00	19.75	27.25	60.00
Median	23.00	22.50	29.50	65.50
75% Percentile	23.00	24.50	33.25	69.00
Maximum	24.00	28.00	40.00	75.00
Mean	22.50	22.63	30.63	65.13
Std. Deviation	1.195	2.973	4.534	5.743
Std. Error of Mean	0.4226	1.051	1.603	2.030

Easy self maintenance of pressure level over time



Pilot study – pressure measurement over 7 days



Conclusions

- ✓ Keeps the resting pressure at a safe and comfortable level
- ✓ Increases working & standing pressure only by adding stiffness
- ✓ Allows easy self maintenance of the pressure level over time

Thank you for your attention!

Next presentation: 27th September

Room: Hall Masaccio

Session: COURSE - Compression therapy for leg ulcers - Basic session (principles and practical session)

Time: 9:00 am – 1:00 pm

Presentation: 10:00 – 10:15 am

Contact:
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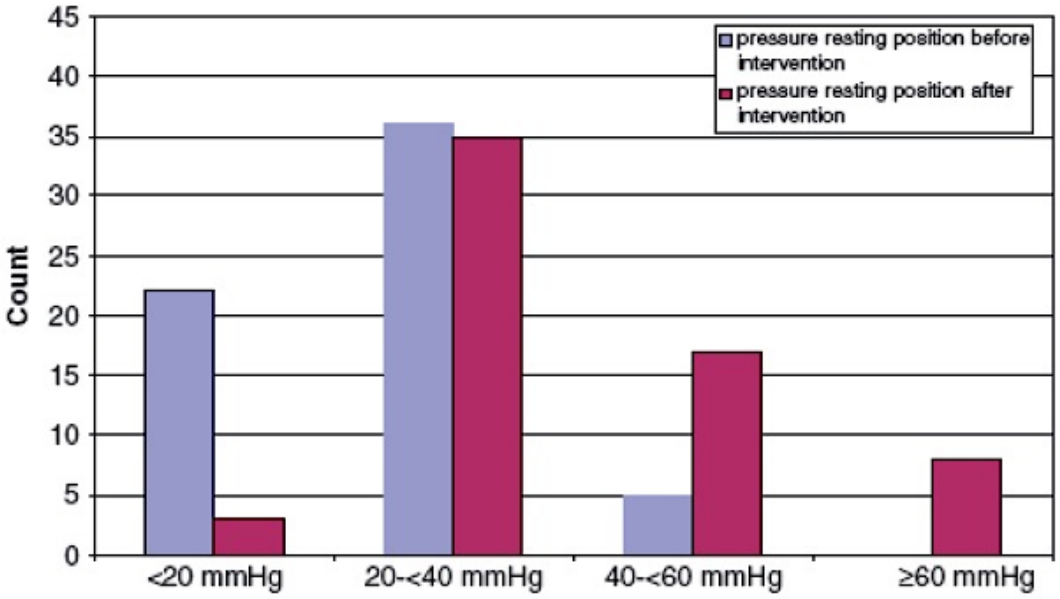
www.presscise.com

No consistency of pressure



Keller et. al. 2009.

- 21 nurses, over 10 years of experience
- Applying bandages daily
- Target pressure 20-40 mmHg

- Not even half of them reached the target pressure
- Afraid of applying to high pressures?
- Larger variation after training