



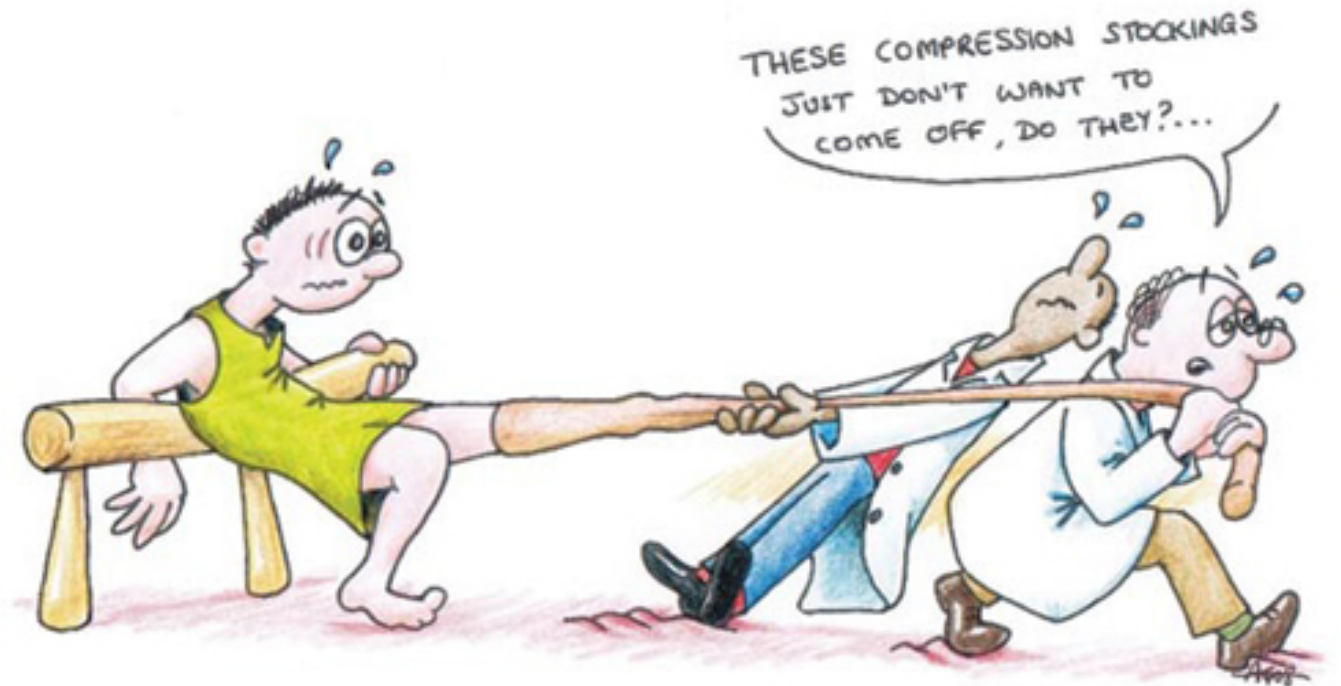
Combining IPC with static  
compression, to improve  
patient's compliance  
using smart materials

*Omer Zelka  
ICC annual meeting  
SS Rotterdam  
June 7<sup>th</sup>, 2018*

**ElaStimed**  
Smart Compression Therapy

# INTRO

- Compression stockings with medium to high level of compression suffer from limited compliance
- Doffing & donning difficulties & patient discomfort are the main factors



# INTRO

- IPC is proven as highly effective, but limits patient mobility, suffers from noisy activation and a high cost
- New development in the field of smart materials, enables combining the benefits of both compression stocking and IPC without their disadvantages



# TECHNOLOGY

- The smart material is built as a rubber band that expands and contracts according to an electric pulse



Deactivated



Activated

# TECHNOLOGY

- Wrapping the band around the leg, creates the initial pressure
- Activating the band, causes the initial pressure to be reduced
- The material is activated using a battery & doesn't generate any heat or noise
- The band is highly flexible:
  - 30mmHg sitting/lying position
  - 34mmHg standing position



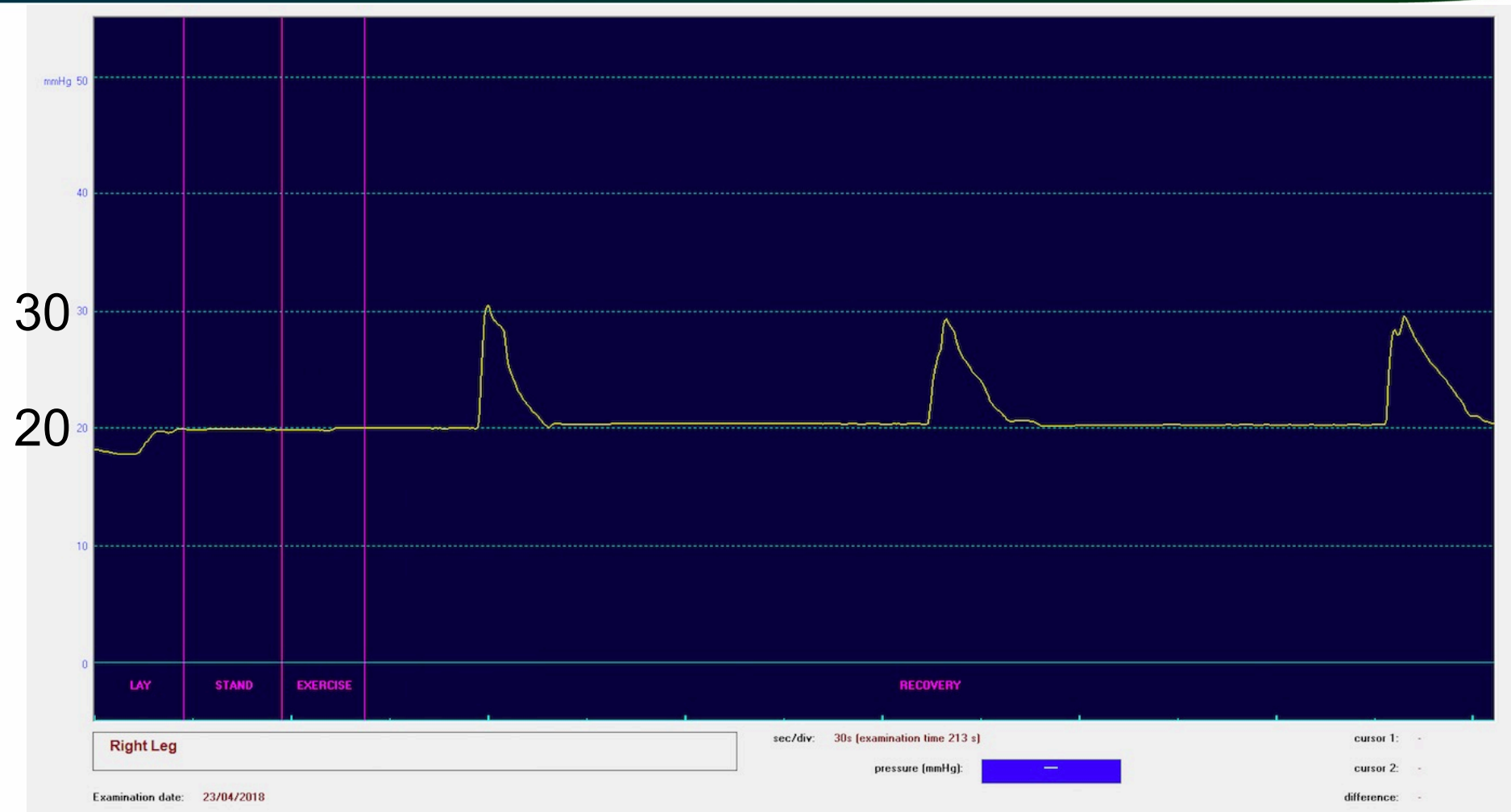


# TREATMENT

- 3 bands are wrapped along the leg in parallel
- Even when activated, the band isn't completely loose, there is always a base line pressure applied
- The band applies 30mmHg when contracted, and 20mmHg when loose
- The 3 bands contract sequentially
- Contraction speed and frequency are highly controllable



# 1 CONTRACTION PER MIN (PICOPRESS)



# PRESSURE SEQUENCE

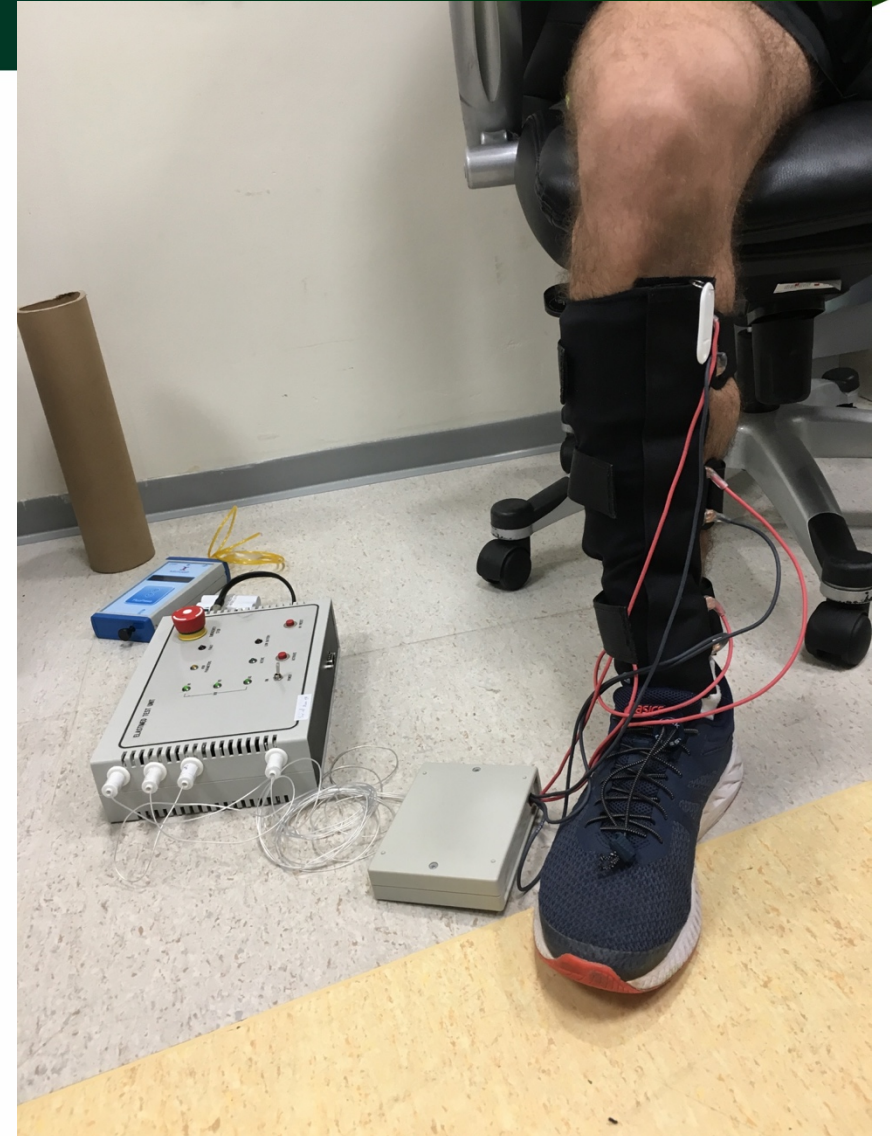
- 1 contraction per minute:
  - 20mmHg - 46.5 sec
  - 20mmHg -> 30mmHg – 0.5 sec
  - 30mmHg - 3 sec
  - 30mmHg -> 20 mmHg – 10 sec
- 2 sec delay between straps (sequential)



## STUDY – *(ONGOING)*

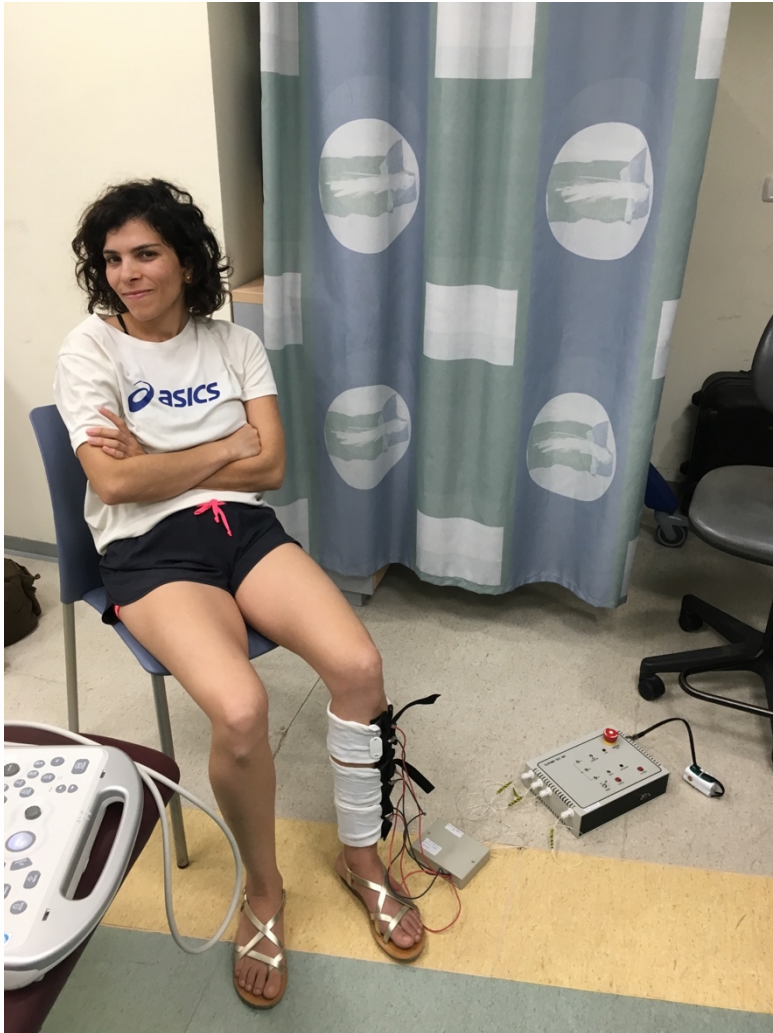
- 10-15 healthy subjects – *3 subjects were tested so far*
- Measurement of peak blood flow velocity on the Popliteal & Femoral veins while sitting down – after 30 mins rest and again after using device for 30 mins
- Results were calculated by average of 3 measurements
- Measurements were made using a Duplex Ultrasound
- Additional measurements were made on the SSV and GSV diameter on the 2<sup>nd</sup> and 3<sup>rd</sup> subjects

# STUDY





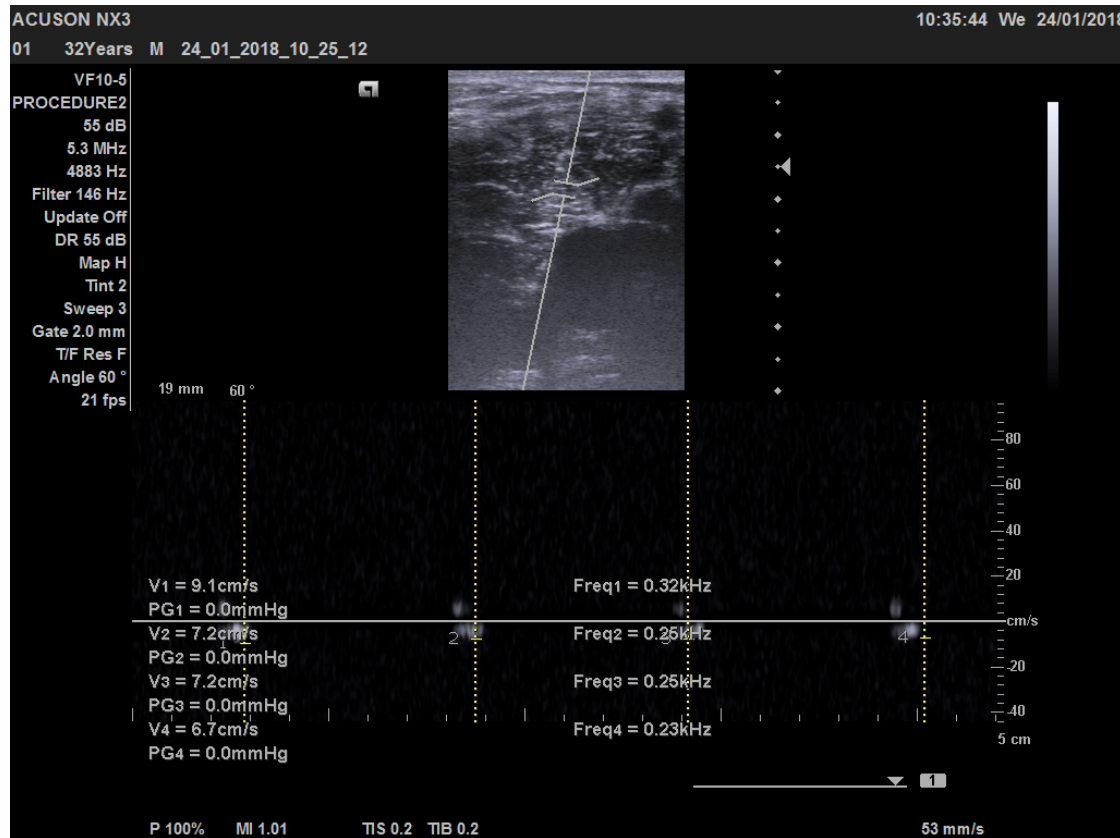
# STUDY



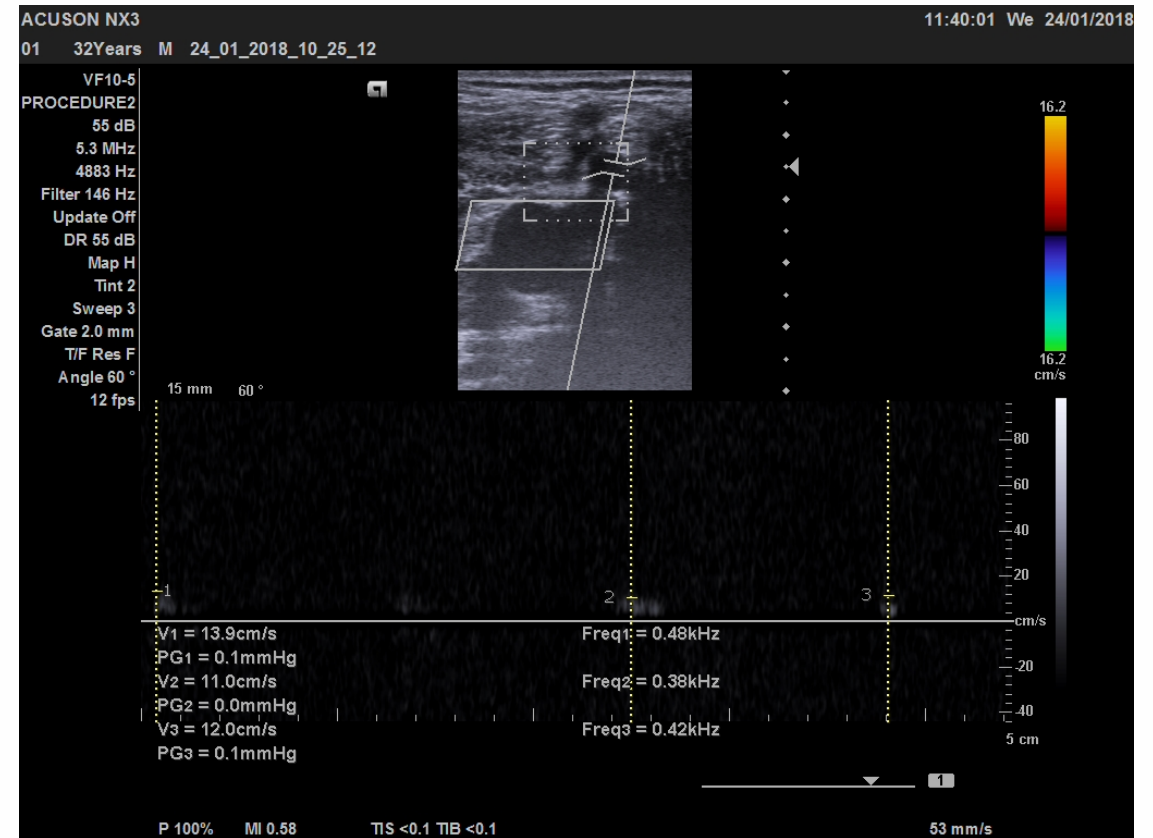
# RESULTS

Subject	Time	Pop. avg. peak flow (cm/s)	Fem. avg. Peak flow (cm/s)	SSV diameter (cm)	GSV diameter (cm)
P-01	T-0	7	8		
	T-30	12.3	9.46		
<b>Improvement</b>		<b>175%</b>	<b>118%</b>		
P-02	T-0	3.18	4.87	0.33	0.32
	T-30	4.8	5.37	0.24	0.23
<b>Improvement</b>		<b>151%</b>	<b>110%</b>	<b>73%</b>	<b>72%</b>
P-03	T-0	2.48	4.37	0.29	0.27
	T-30	5.43	5	0.25	0.26
<b>Improvement</b>		<b>219%</b>	<b>114%</b>	<b>86%</b>	<b>96%</b>
<b>Avg.</b>		<b>182%</b>	<b>114%</b>	<b>79%</b>	<b>84%</b>

# RESULTS – P-01 - POPLITEAL



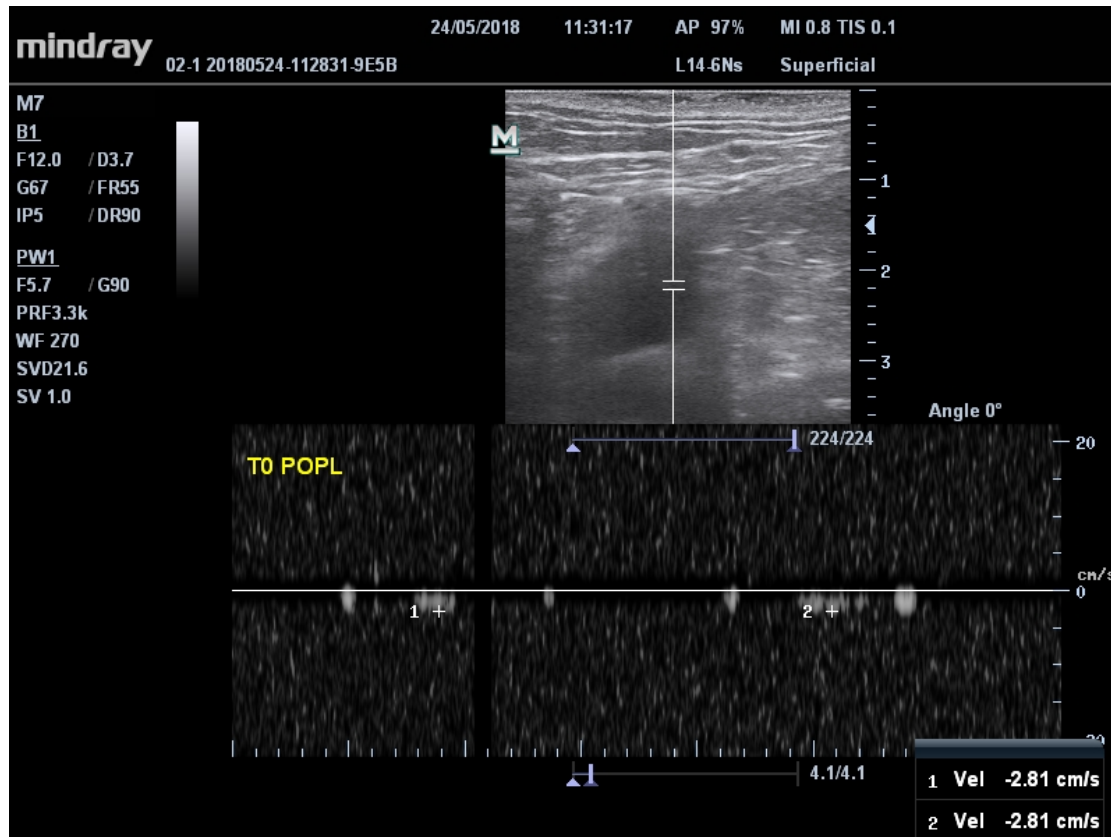
T0



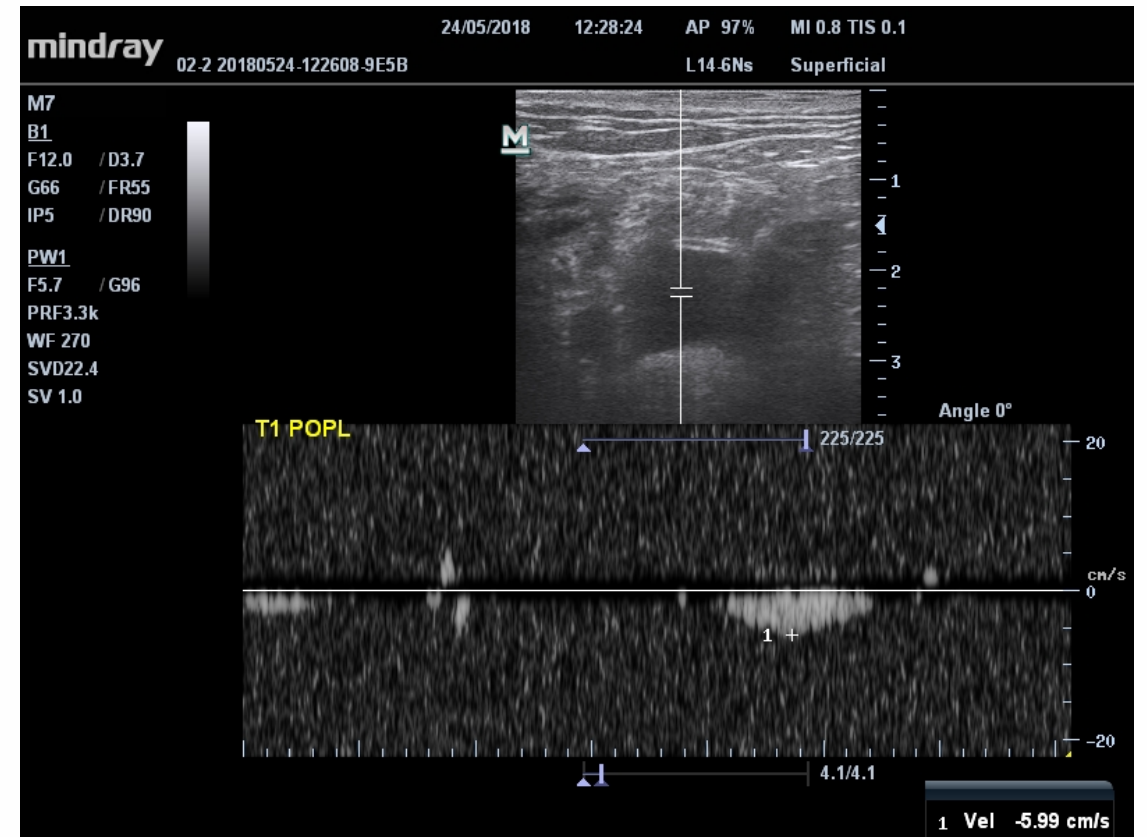
T30



# RESULTS – P-02 - POPLITEAL



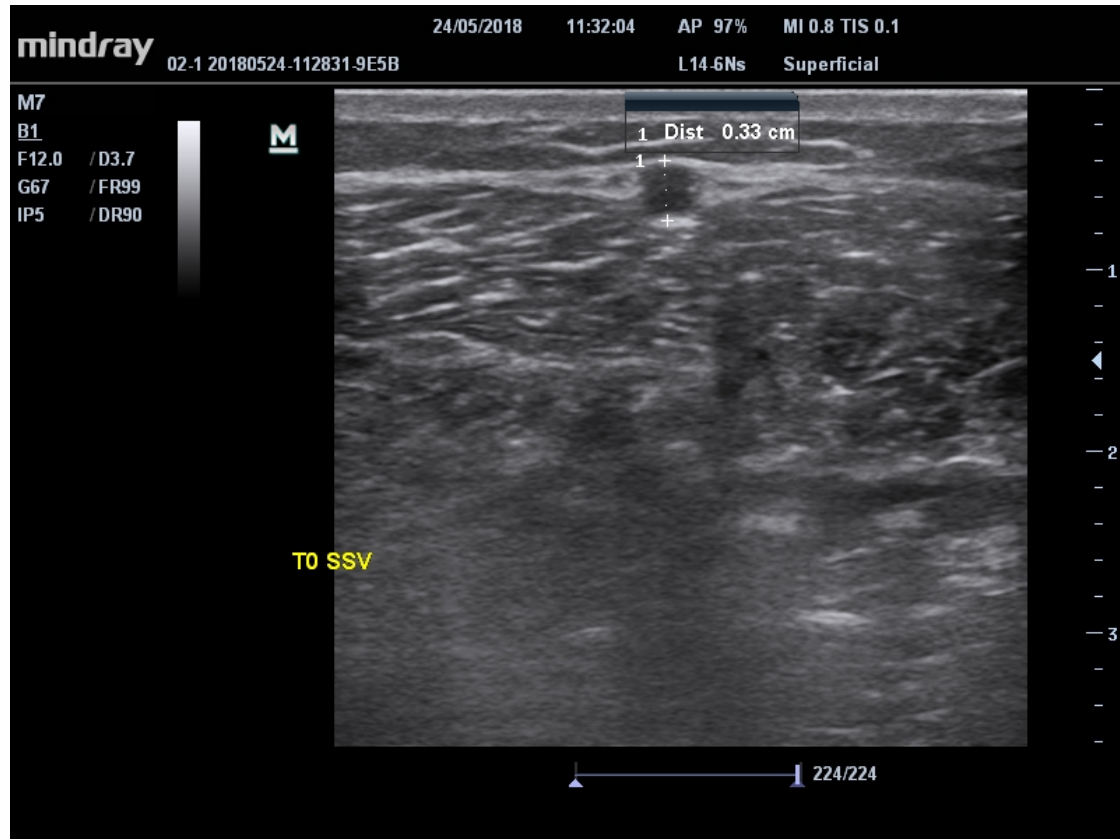
T0



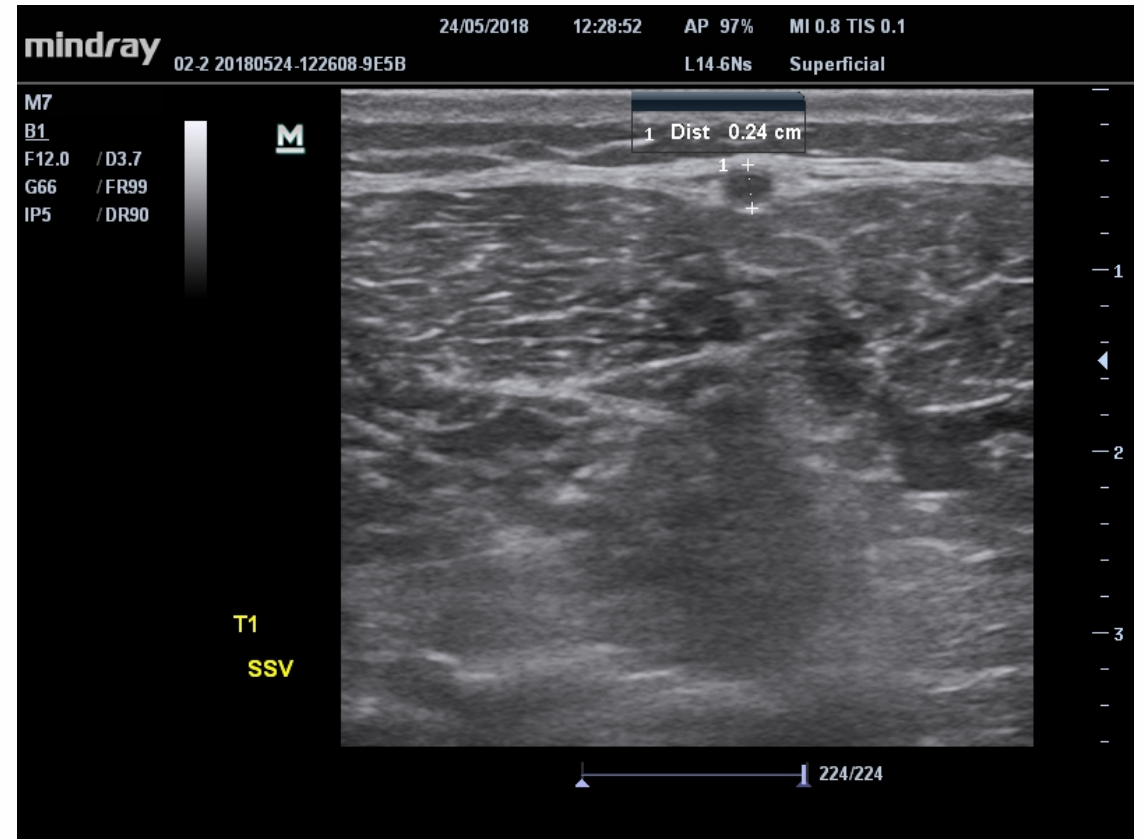
T30



# RESULTS – P-02 - SSV



T0



T30

# CONCLUSION

- Combining static pressure with IPC by using new technology allow for a highly effective device, that is easy to don/doff and comfortable to use
- Can significantly increase patient compliance

# NEXT VERSION OF DEVICE

- Fully portable
- 4 bands
- Mechanism for validating initial pressure
- 3 pressure peaks per minute
- Higher pressure change – 10mmHg to 30mmHg or 20mmHg to 40mmHg





# THANK YOU

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