

# Innovation in compression based on interface pressure measurement

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25<sup>th</sup> September 2016

# Challenges with Compression Bandages

Consistent & accurate application

Sustained dose of pressure

Monitoring compression status

Variability in effectiveness

Application of reduced compression

# Achieving application consistency

- Shape change indicators
  - Ovals → circles; Rectangles → squares
    - Subjective interpretation
    - No calibration for reduced compression
    - Subjective interpretation of impaired dose
  - Markings on device matched to a scale
- Application at full stretch
  - More consistent
  - No calibration for reduced compression
  - Subjective interpretation of impaired dose
- Compression dose varies

# The Technical Solutions

- Monitor interface pressure
  - Pneumatic transducers
  - Electromechanical sensors
  - Printed ink
  - Piezoelectric
  - Capacitive sensors (surfaces)
- Compute from tension and radius: Laplace
- Easy to understand and use system needed

## A New System: Operating Principle

- Objectively measure extension in elastic material with known properties
- Measure the radius of application
- Use algorithm based on Laplace's Law
- Compute interface pressure
- Report to user interface

# Measuring bandage tension

## Operating Principle

- Measure stretch
  - Analogue: strain gauge plethysmography
- Integrated transducer technology
  - Sensor knitted into bandage structure
  - Electrical signal proportional to extension
  - Report signal to digital “brain”

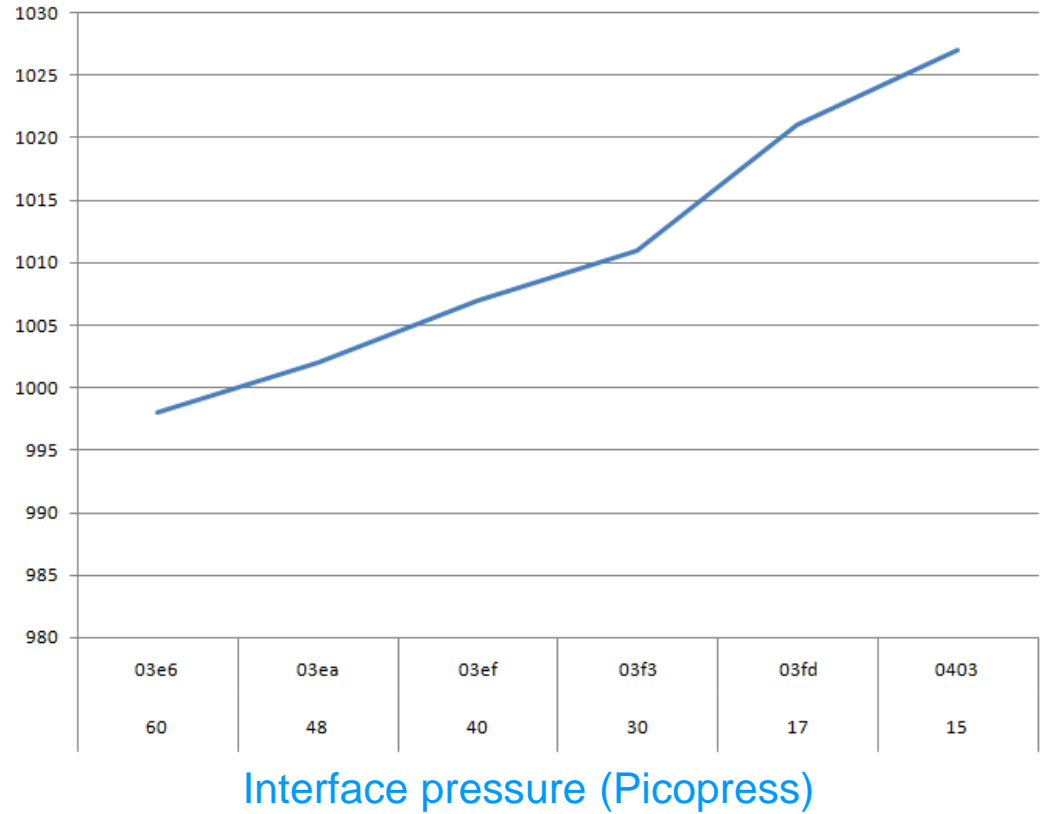
# Smart Bandage: Technical

- Functional demonstrator: Smartlifeinc Limited
- Elastic bandage with integrated silver sensor
- Electronic “brain”
- App on user interface; Smartphone, tablet
- User-defined parameters inputted
- Real-time display of application efficiency
- Real-time display of bandage status

# Smart Bandage Prototype



Resistance







## Smart Bandage: Benefits

- Higher quality bandage application / dose
- Monitor compression during clinic visits
- Improved healing through greater accuracy of compression dose
- Adaptation for low compression dose
- Washable
- Subject to development agreement with a wound management company

# Smart Bandage: Summary

- Challenges with bandages application reduce effectiveness
- Need for improved application and in-use monitoring
- Smart Bandage with integrated sensor and algorithm is in development
  - Real-time feedback on accuracy of application
  - Real-time monitoring of compression in-use
  - Facilitates application of reduced compression
  - Possibility of remote monitoring