

**RCOA**  
Royal College of Anaesthetists

**WINTER SYMPOSIUM**  
3-4 December 2020

**Innovation**  
Chair: Dr Gunjeet Dua

**The NHS Innovation Accelerator (NIA)**  
Professor Tony Young OBE

Dr Alastair Darwood



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**DARWOOD IP**  
LOW COST TRAUMA  
VENTILATION

**TECHNOLOGY  
DEMONSTRATION**  
A DARWOOD MRC'S BMBS BmedSci



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UK 2020

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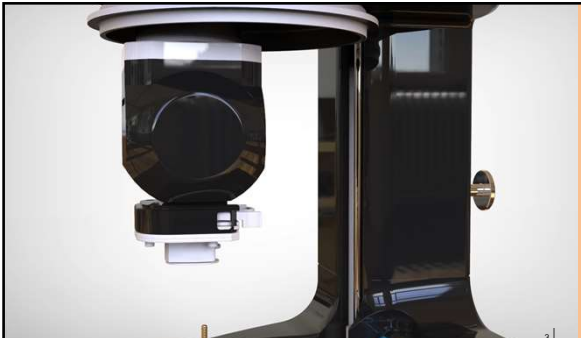
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**TEAM**

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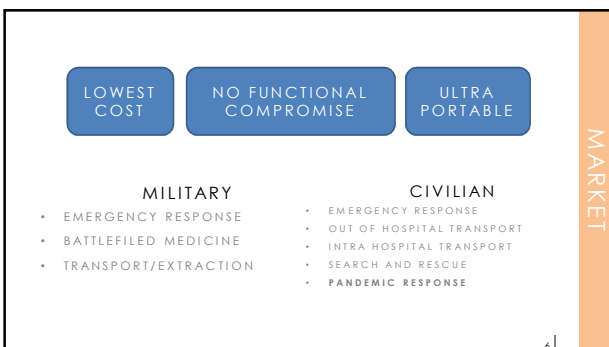
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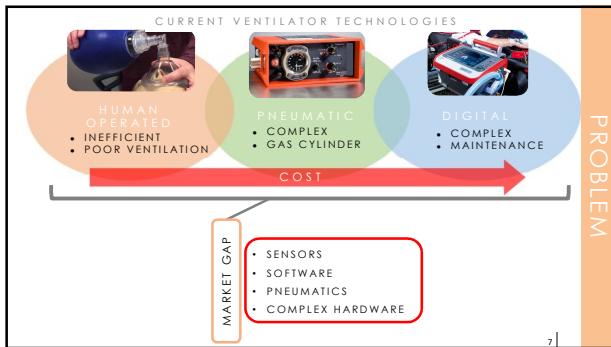
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**Anaesthesia**  
Peri-operative medicine, critical care and pain

Association of Anaesthetists

Original Article

**The design and evaluation of a novel low-cost portable ventilator**

A. Darwood, J. McCann, R. Kwanicki, B. Martin, P. Jones

First published: 03 June 2019 | <https://doi.org/10.1111/anae.14726> | Citations: 1

This article is accompanied by an editorial by Young, Anaesthesia 2019; 74: 1357-60 and an article by Williams et al., Anaesthesia 2019; 74: 1416-24.

[Read the full text >](#) [PDF](#) [COMMENTS](#) [TOOLS](#) [SHARE](#)

**Summary**

Modern mechanical ventilator technologies broadly consist of digitally-controlled electronic devices and analogue systems driven by compressed gas sources. Drawbacks such as high cost, complex maintenance and the need for cumbersome sources of compressed driving gas hinder adoption in pre-hospital and low-resource environments.

**SOLUTION**

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10 | SOLUTION

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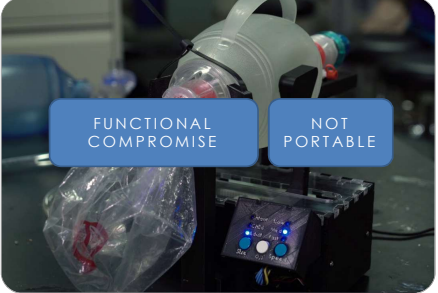
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11 | SOLUTION

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### 'BAG SQUEEZER'

- EXTERNAL DEVICES
- BULKY – LARGER THAN BVM ITSELF
- COMPLEX ACTUATION
- NO PRECISION
- NO FEEDBACK DATA

12 | SOLUTION

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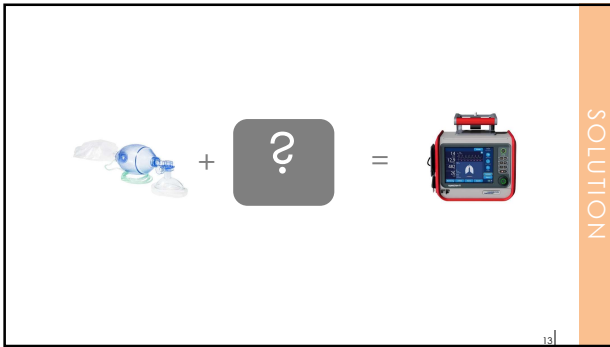
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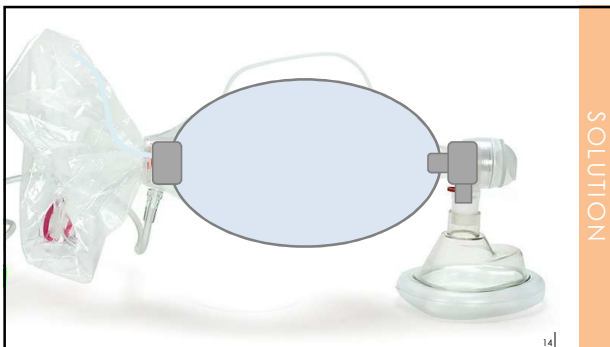
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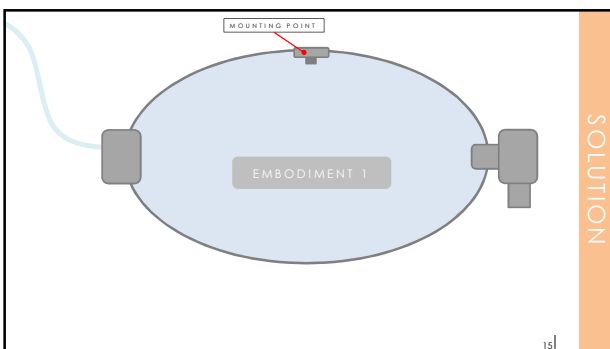
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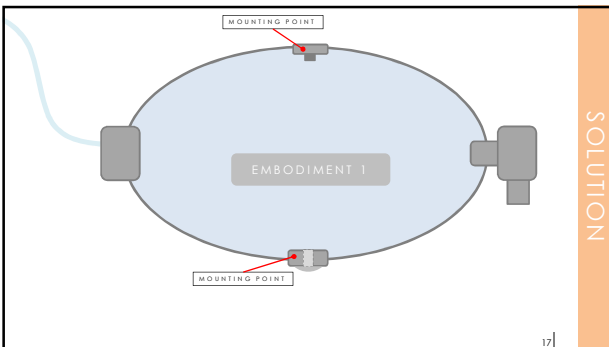
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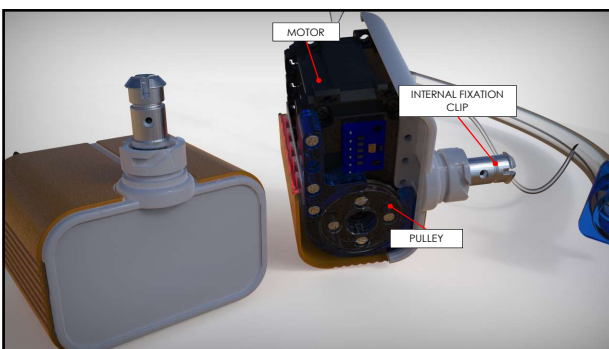
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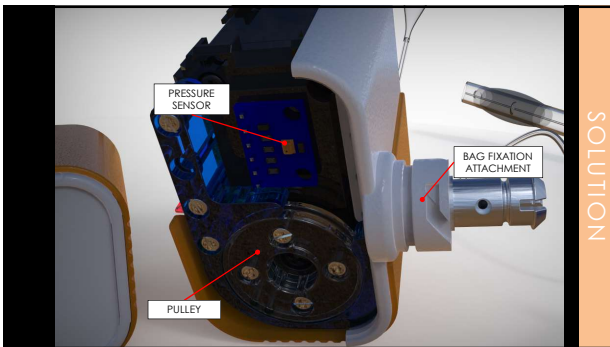
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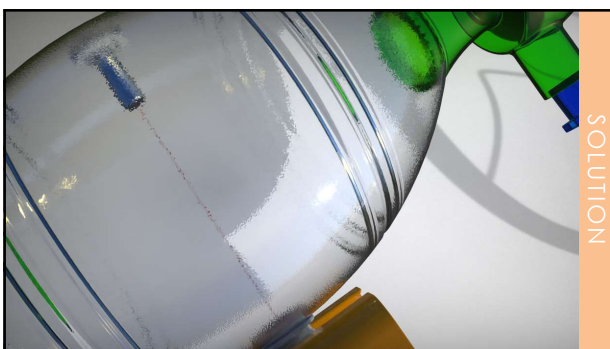
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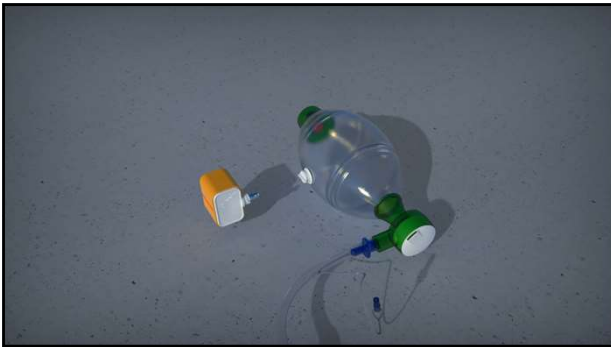
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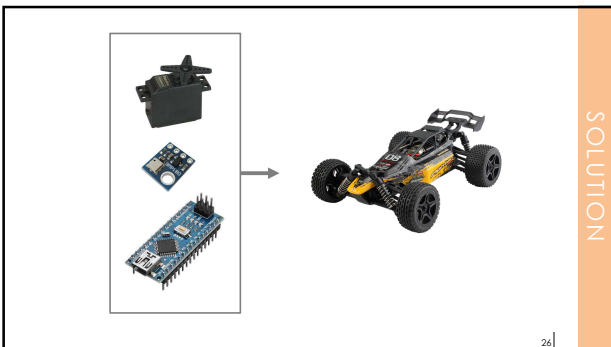
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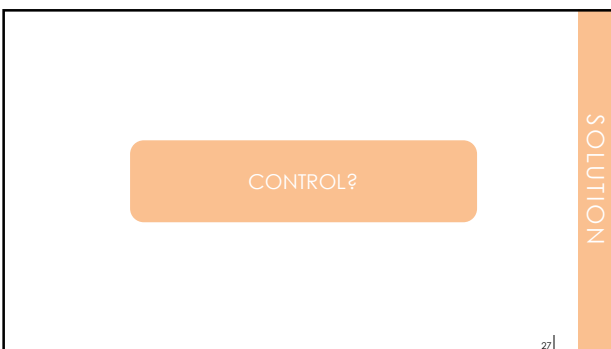
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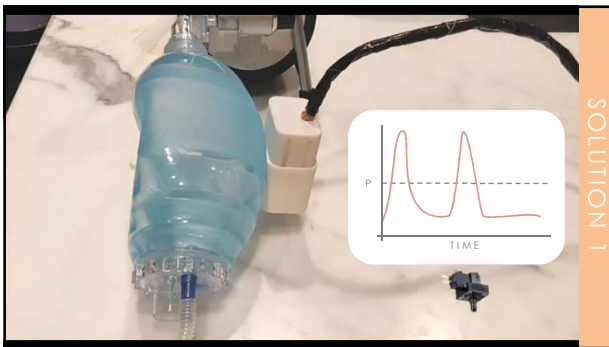
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### PERFORMANCE TODAY

- STANDARD PCV
  - USER SPECIFIED PEAK PRESSURE
- SAFETY MONITORING
  - LEAK
  - TIDAL VOL
  - COMPLIANCE
  - RESISTANCE
  - HARDWARE FAILURE
  - AUTOMATIC RE-CALIBRATION
  - STANDARD E.G. BATTERY

MHRA  
SPECIFICATION

PROTOTYPE

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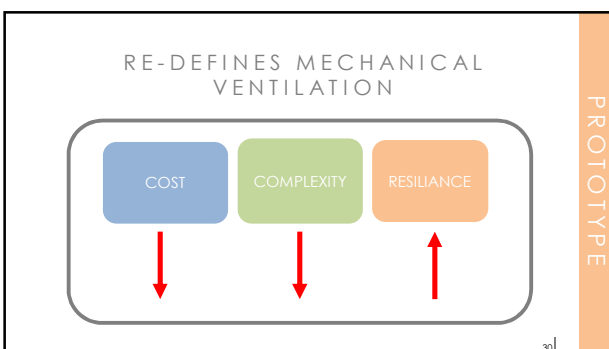
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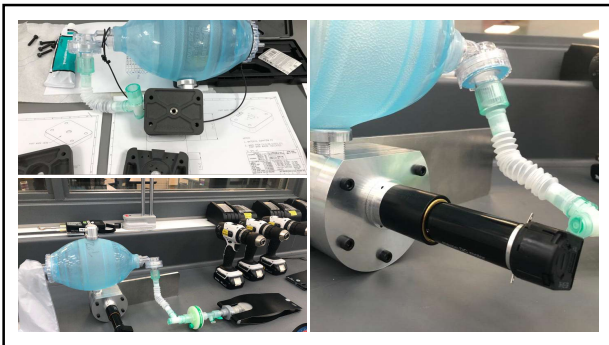
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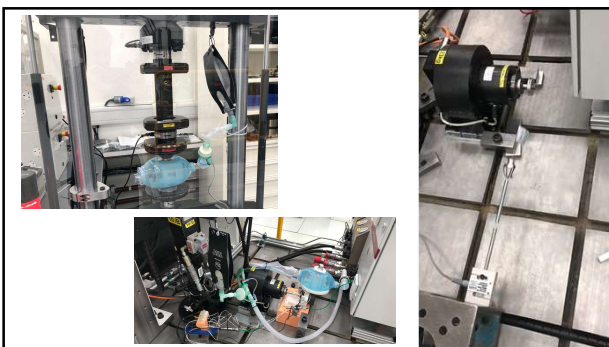
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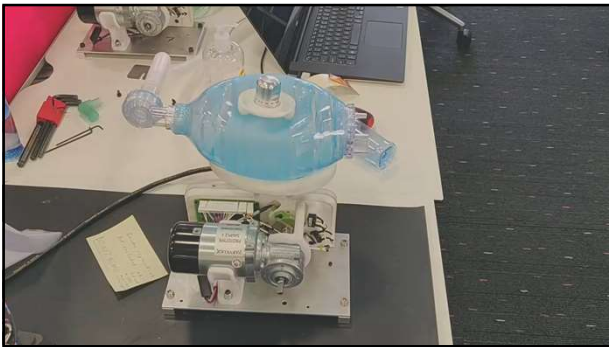
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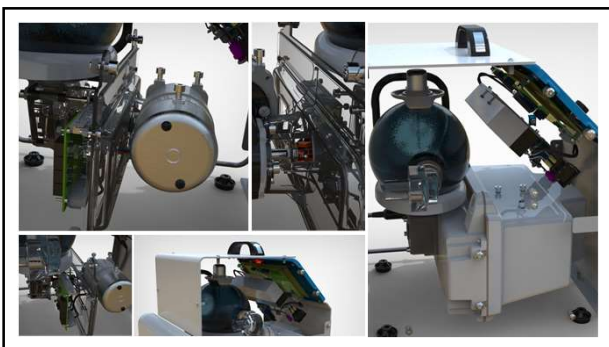
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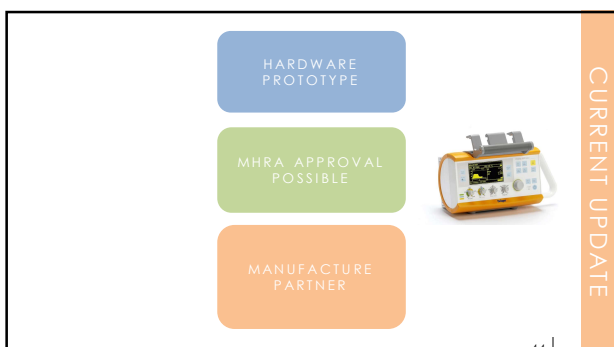
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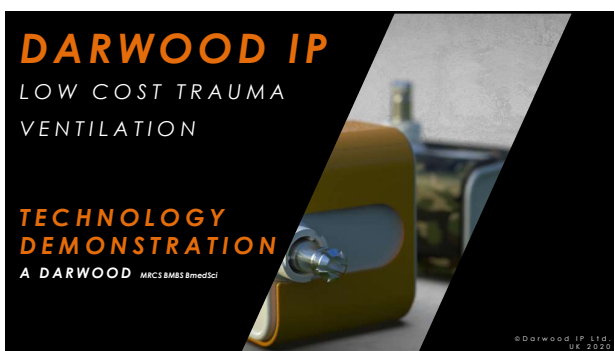
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