Resuscitation in a diving bell

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Project Background
Meet the team/conflicts of interest
The best we can do?
Phase 1
What are we trying to achieve?

Depth of compressions: 5–6cm

Rate: 100–120bpm
**Standard CPR**

- **Depth:** 98%
- **Depth:** 5.5cm
- **Rate:** 92%

**Lucas**

- **Depth:** 98%
- **Depth:** 5.4cm
- **Rate:** 98%

**NCCD**

- **Depth:** 100%
- **Depth:** 5.9cm
- **Rate:** 5%
### Standard CPR
- **Depth:** 5.5cm
- **Rate:** 117bpm

### Lucas
- **Depth:** 5.4cm
- **Rate:** 101bpm

### NCCD
- **Depth:** 5.9cm
- **Rate:** 95bpm
Hot water suit
Hot water suit

Standard CPR, suit closed
- Depth 68%

Standard CPR, suit open
- Depth 100%

mCPR, all suit positions
- both devices worked well
- application affected by suit, failed attempts for both devices
Head to chest CPR
Head to chest CPR

Depth: 32% (0–80)
Rate: 95%
Position: 100%
<table>
<thead>
<tr>
<th>Adverse events</th>
<th>Sustainable for a 30-40min time period?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sore head and neck - still in pain 1 day later</td>
<td>No</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Headache</td>
<td>No</td>
</tr>
<tr>
<td>Sore head and headache</td>
<td>No</td>
</tr>
<tr>
<td>Sore head</td>
<td>No</td>
</tr>
<tr>
<td>Sore head</td>
<td>No</td>
</tr>
<tr>
<td>Sore head, felt unwell</td>
<td>No (1.22)</td>
</tr>
<tr>
<td>Sore head</td>
<td>No</td>
</tr>
<tr>
<td>Sore head</td>
<td>No (1.50)</td>
</tr>
<tr>
<td>Sore head</td>
<td>No</td>
</tr>
</tbody>
</table>
Head to chest CPR

Depth: 32% (0–80)
Rate: 95%
Position: 100%
Prone knee to chest CPR
Prone knee to chest CPR

- Positioning impossible
- Compressions ineffective
Prone knee to chest CPR

- Positioning impossible
- Compressions ineffective
Knee to chest CPR

Depth: 12% (0–99)
Rate: 87%
Knee to chest CPR is:

Variable

- 50% of providers achieved <12% to depth
Knee to chest CPR is:

Variable
- 50% of providers achieved <12% to depth

Teachable
- 41% depth --> 91% depth with instruction
Knee to chest CPR is:

**Variable**
- 50% of providers achieved <12% to depth

**Teachable**
- 41% depth --> 91% depth with instruction

**Safe**
Knee to chest CPR is:

Variable
- 50% of providers achieved <12% to depth

Teachable
- 41% depth --> 91% depth with instruction

Safe

Sustainable
40 minutes of knee to chest CPR

Depth: 75%

Mean depth: 5.3cm

Rate: 128bpm
NCCD seated
NCCD seated

Depth: 100%
Rate: 98%

NCCD whilst moving →
  seated/lying/seated

- Depth 99%, Rate 95%
Knee to chest in bell

- Depth 49%, Rate 56%

Sustainable?
Phase 2
How Babies Make Decisions

Is it food?

Yes:
Stare at it, poke it, drop it on the floor, smash it, throw it, or rub it in your hair.

No:
Try to eat it immediately.
5 Rescue breaths
Manual CPR on bell floor (straddle)
Manual CPR on bell floor (straddle)

Depth 95%
Rate 77%
Phase 3
Summary

A draft algorithm for the delivery of resuscitation in a diving bell will be published.
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• Airway and breathing management prioritised
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- mCPR is the most effective method of delivering chest compressions
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- Conventional CPR can be delivered on some bell floors
Summary

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- Airway and breathing management prioritised
- mCPR is the most effective method of delivering chest compressions
- Conventional CPR can be delivered on some bell floors
- Knee to chest CPR is safe, teachable and somewhat effective
Summary

A draft algorithm for the delivery of resuscitation in a diving bell will be published

- Airway and breathing management prioritised
- mCPR is the most effective method of delivering chest compressions
- Conventional CPR can be delivered on some bell floors
- Knee to chest CPR is safe, teachable and somewhat effective
- Head to chest (and prone knee to chest) CPR NOT advised
Does it work?
Does it work?

Outcomes:

- Will be poor: survival to discharge in the UK <5%
Does it work?

Outcomes:

- Will be poor: survival to discharge in the UK <5%
- Will never tell the whole story: duty of care, second victim