

“Rhythm of Life Aid” (ROLA)



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Mark Thielen



“Rhythm of Life Aid” Outline

- **Introduction Rhythm of Life**
- **Rythm of Life Aid (ROLA) device**
- **User test @ Maxima Medical Centre Veldhoven**
- **Results**
- **Conclusions**
- **Improved ROLA device**

Introduction

Floris Kimman



dr. W. (Wei) Chen



prof.dr. S. (Sidarto)
Bambang Oetomo



G.J.A. (Geert) van
den Boomen



prof.dr.ir. L.M.G.
(Loe) Feijs

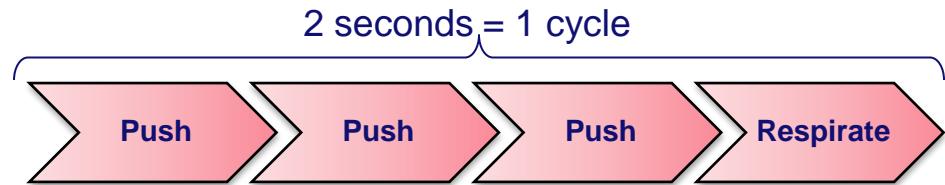


ir. P.J.F. (Peter)
Peters



Instructions resuscitation of the newborn:

- **Rhythm:**
 - **30 cycles/minute**
 - **Cycle: Heartmassages:Respiration = 3:1**
- **Compression of the thorax 1/3 of total chest depth (relative)**



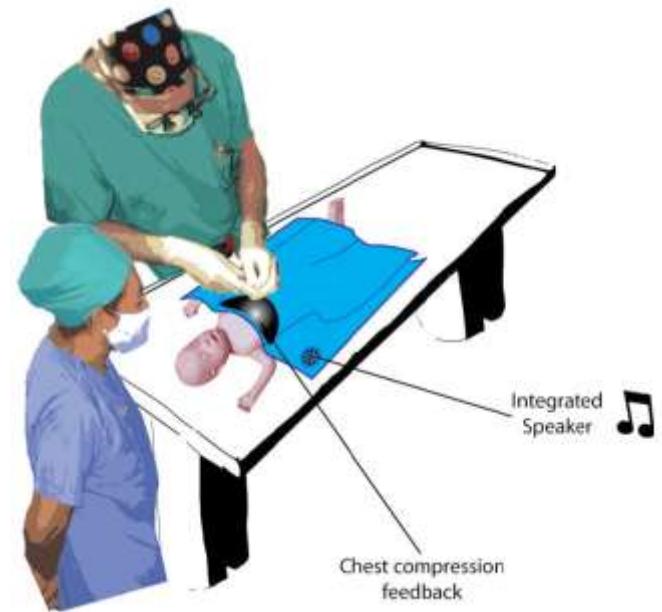
[Challenge] During this tense procedure it is hard to maintain:

- **Correct rhythm**
- **Consistant compression depth**

“Rhythm of Life Aid” (ROLA) device

Created by Floris Kimman:

- Support doctor/nurse by:
 - using acoustic signal
 - indicating compression depth



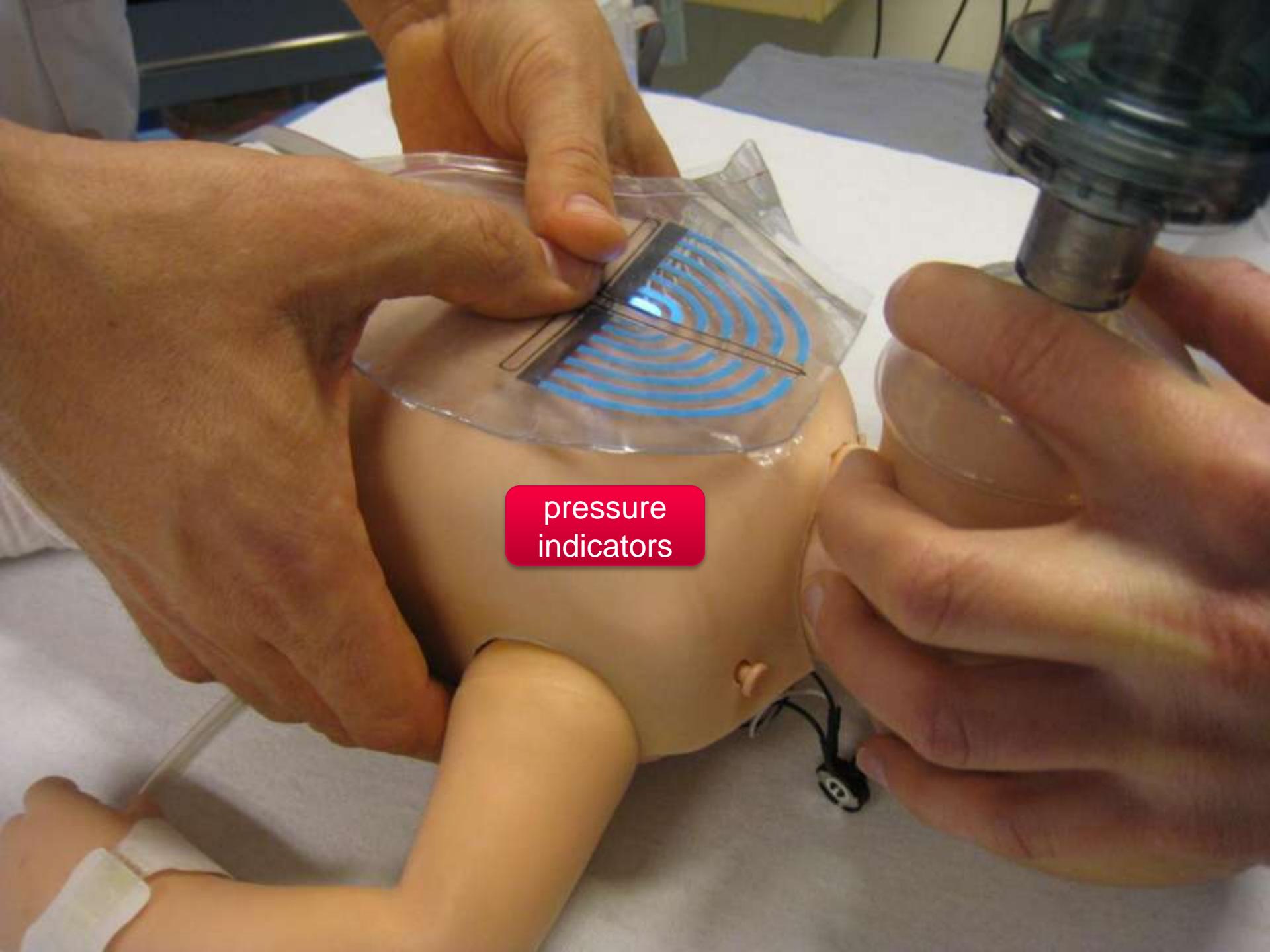
máxima
medisch centrum

TU/e

Technische Universiteit
Eindhoven
University of Technology

Sound-box 🎵

pressure
indicators



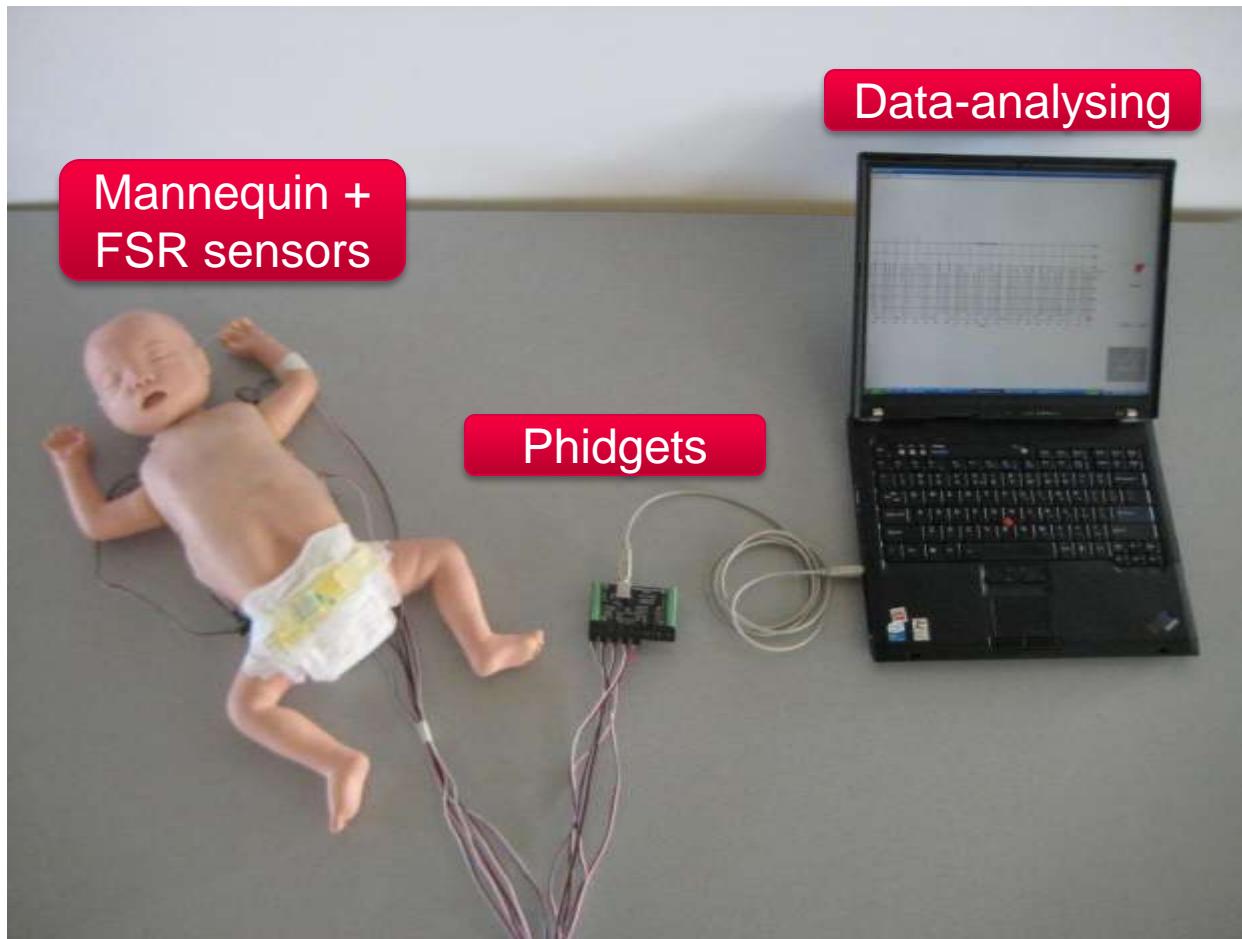
pressure
indicators

User Test Goals:

Does ROLA Device support correct:

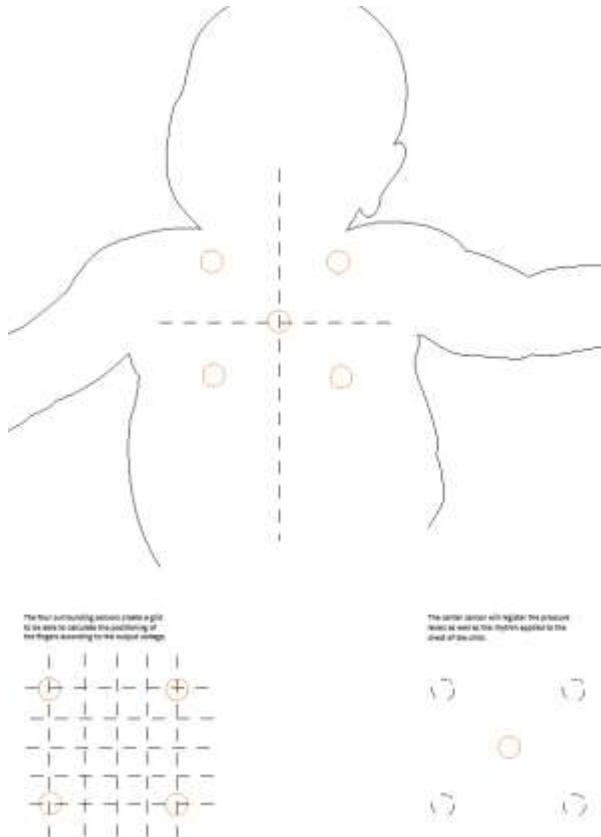
- Rhythm?
- Compression depth of chest?
- Positioning of the thumbs?

User Test Setup



The mannequin

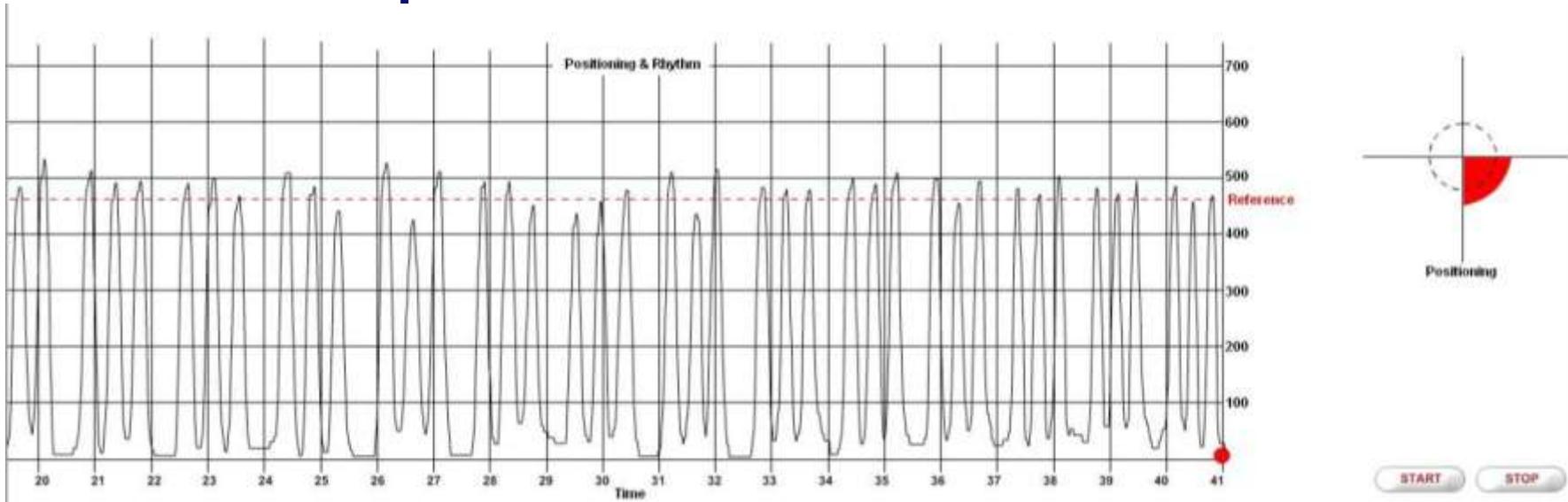
Includes grid of 5 FSR sensors to determine position and pressure level



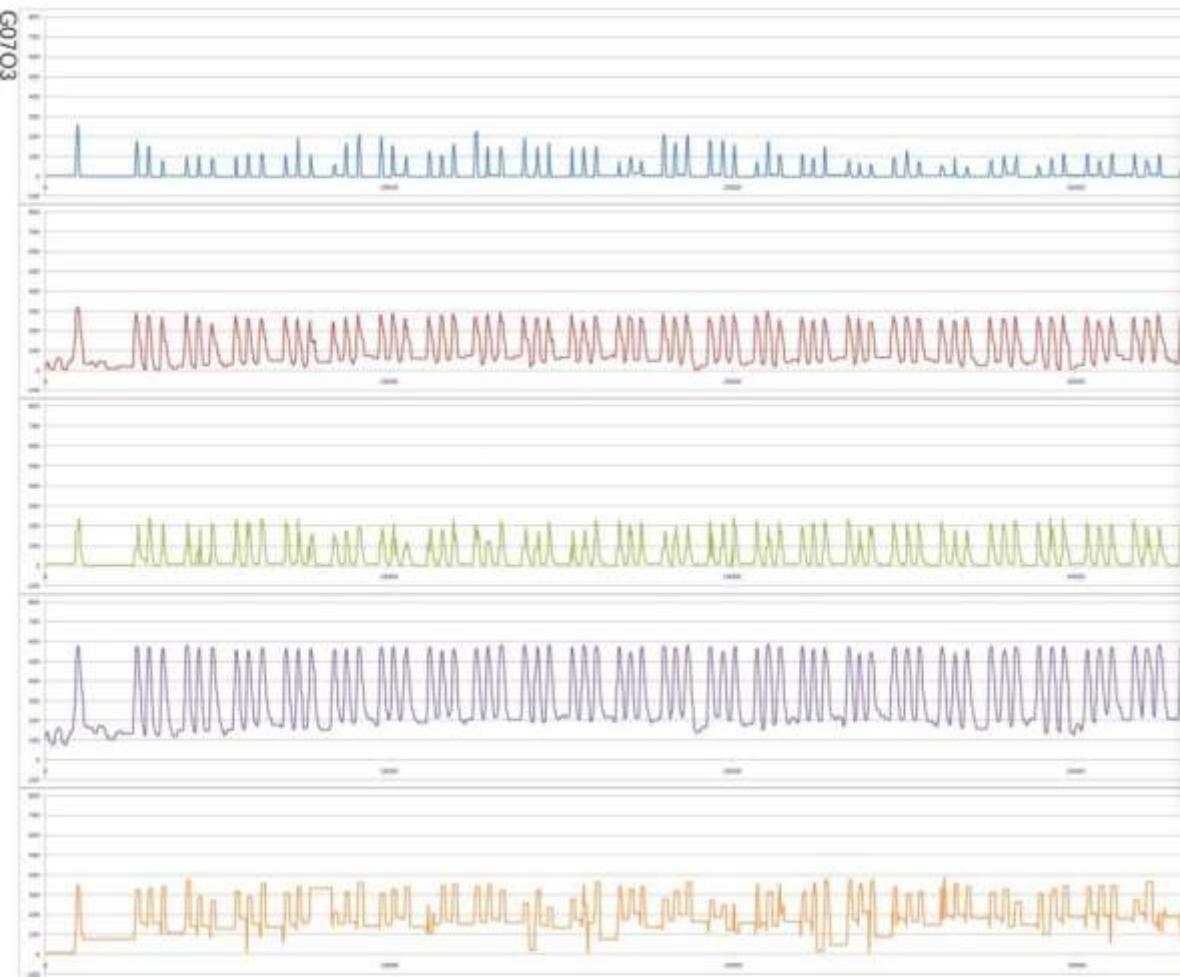
Sensors & Phidgets

Using FSR Sensors & Phidgets:

- Visualize relative compression depth
 - Prof. dr. Sidarto Bambang Oetomo's as reference value
 - Determine position of thumbs



Results



“Rhythm of Life Aid” Test in practice



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“Rhythm of Life Aid” Test in practice

10 couples (doctor + nurse)

Session 1 (control):

- 90 sec inflations doctor, compressions nurse
- 90 sec inflations nurse, compressions doctor

Session 1

10 couples
normal
procedure

Session 2 randomisation:

- Repeat procedure
- 5 pairs without ROLA
- 5 pairs with ROLA

Session 2

5 couples
normal
procedure

5 couples using
ROLA device





“Rhythm of Life Aid” Analysing

- Use video tapes instead of computer-data due to Flash-timer
- Calculating % of correctly performed CPR cycles
 - Rhythm Score =

$$\frac{45 - |\text{number of correct cycles} - 45|}{45} \times 100\% =$$

- Pressure measurement:
 - Built-in FSR sensors

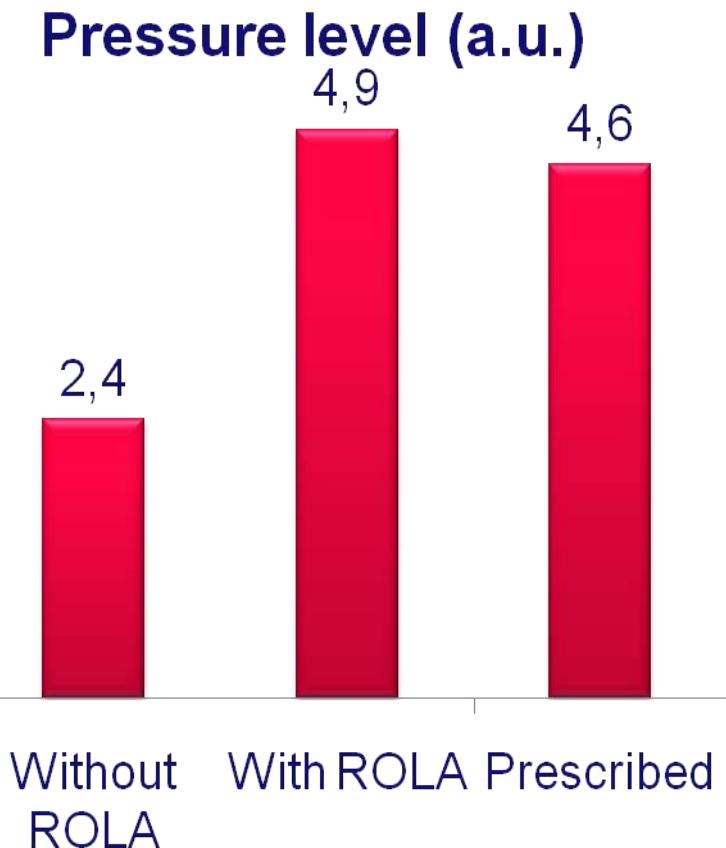
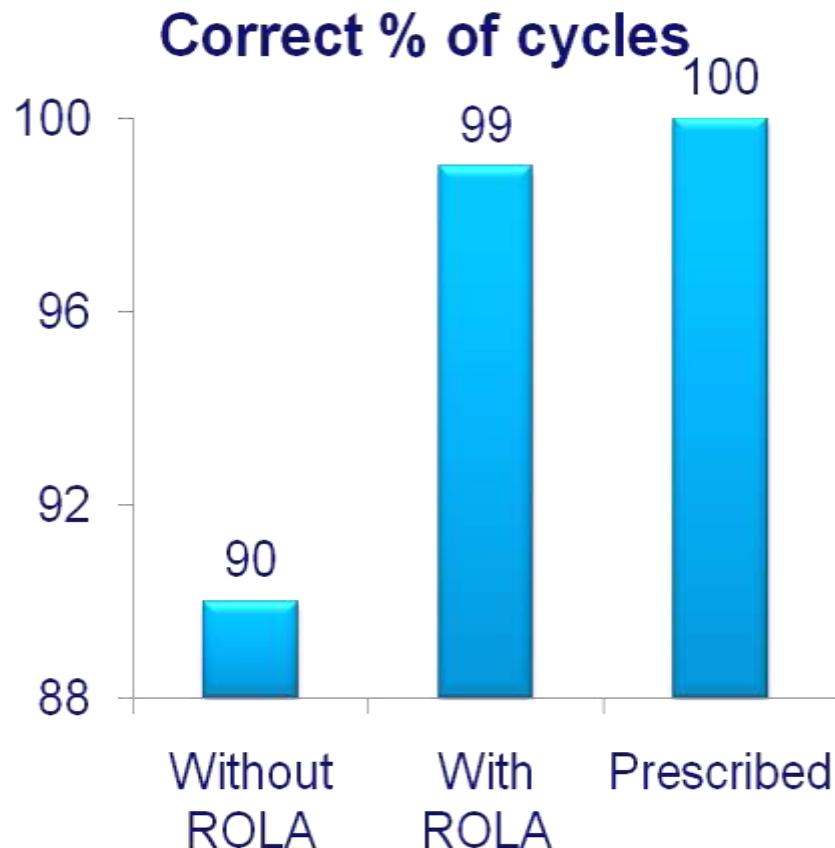
Results Rythm score (%)

	Session 1	Session 2	P-value
Control	91 ± 5	90 ± 10	n.s.
ROLA	84 ± 14	99 ± 2	<0.05
P-value		<0.05	

Results Compression pressure (a.u.)

Reference: 4.6	Session 1	Session 2	P-value
Control	3.3 ± 1.0	2.4 ± 1.4	n.s.
ROLA	3.1 ± 1.6	4.9 ± 0.8	<0.05
P-value		<0.01	

Results second session



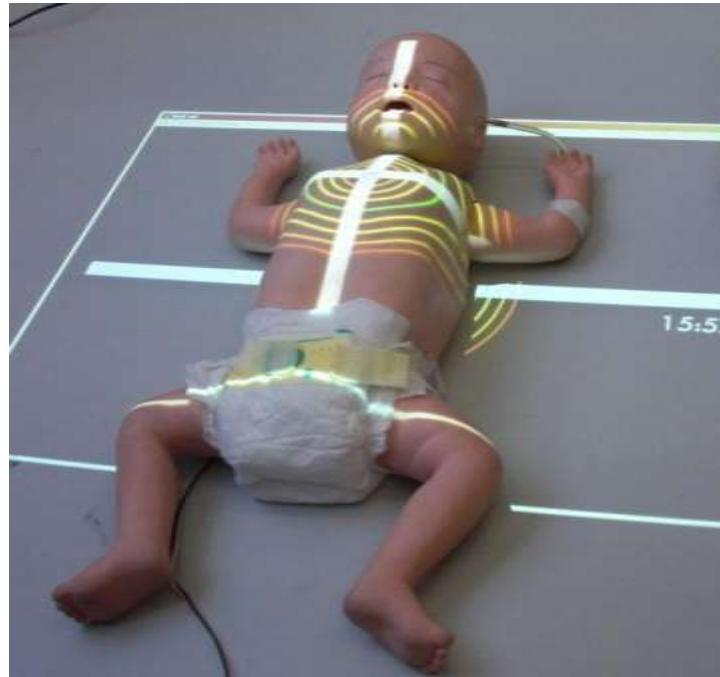
Conclusion

The use of the ROLA leads to better:

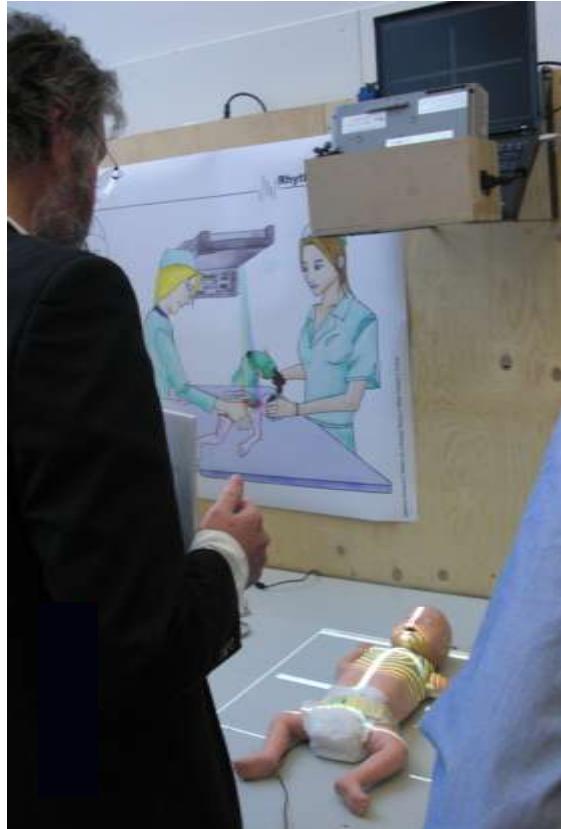
- maintenance of correct rhythm over time
- respiration:compressions ratio
- More consistant compression pressure

Improved ROLA Device

- Better depth indication
- Automated calibration
- Wireless



Improved ROLA Device



“Rhythm of Life Aid” (ROLA)

Thank you for your attention

