

# Changing the Game for Healthcare Professionals



Up to one in five babies need help to breathe at birth



This is called Neonatal Resuscitation



# Neonatal Resuscitation is Stressful

This can result in:

Distraction

Decision making deficiencies

Impaired working memory

Deviations from the resuscitation algorithm

Medical errors

Poor patient outcomes

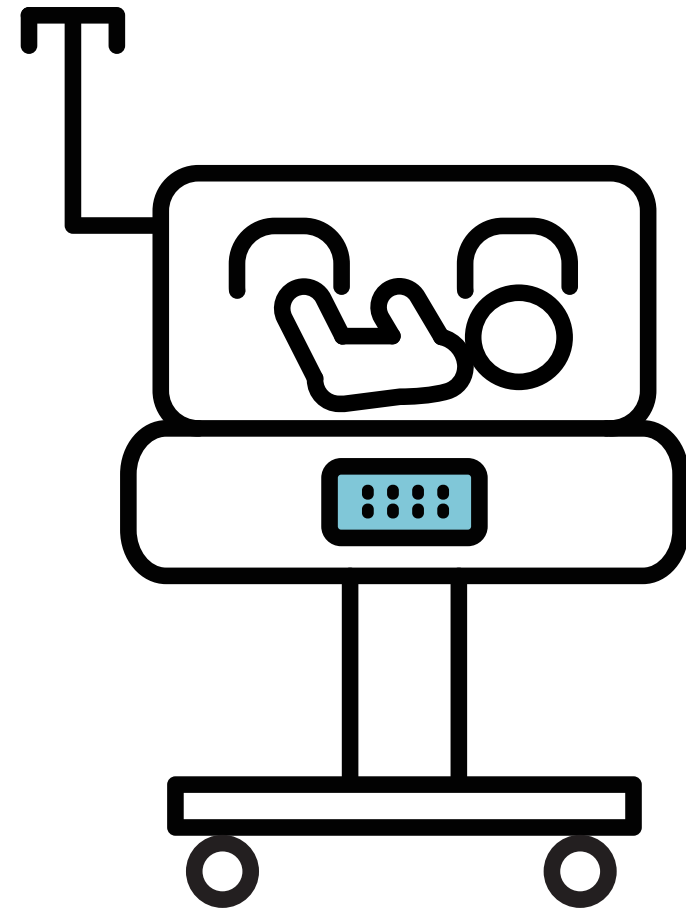
Fatal errors / Death





66% of newborn deaths during resuscitation are caused by break down in non-technical skills like decision making, communication, and teamwork rather than technical skills like mask ventilation or chest compression.





### Simulation Training

Financial- and human-capital  
intensive

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### Reading Textbook

Lacks clinical relevance

???

# Existing Training Options

- Focus on technical skills
- Resource intensive
- Time consuming
- Requires a Simulation Specialist

# Simulation Training

## Resource Intensive

- Simulation center start-up costs: \$200,000 to \$1.6 million USD
  - Limited space and funding available for equipment
- Annual maintenance costs: at least \$15,000 USD
- Annual Salary for Simulation Specialist: \$90,000 USD

## Time Consuming

- Staff scheduling, Set-up time, Administration

## Requires a specially trained Simulation Specialist

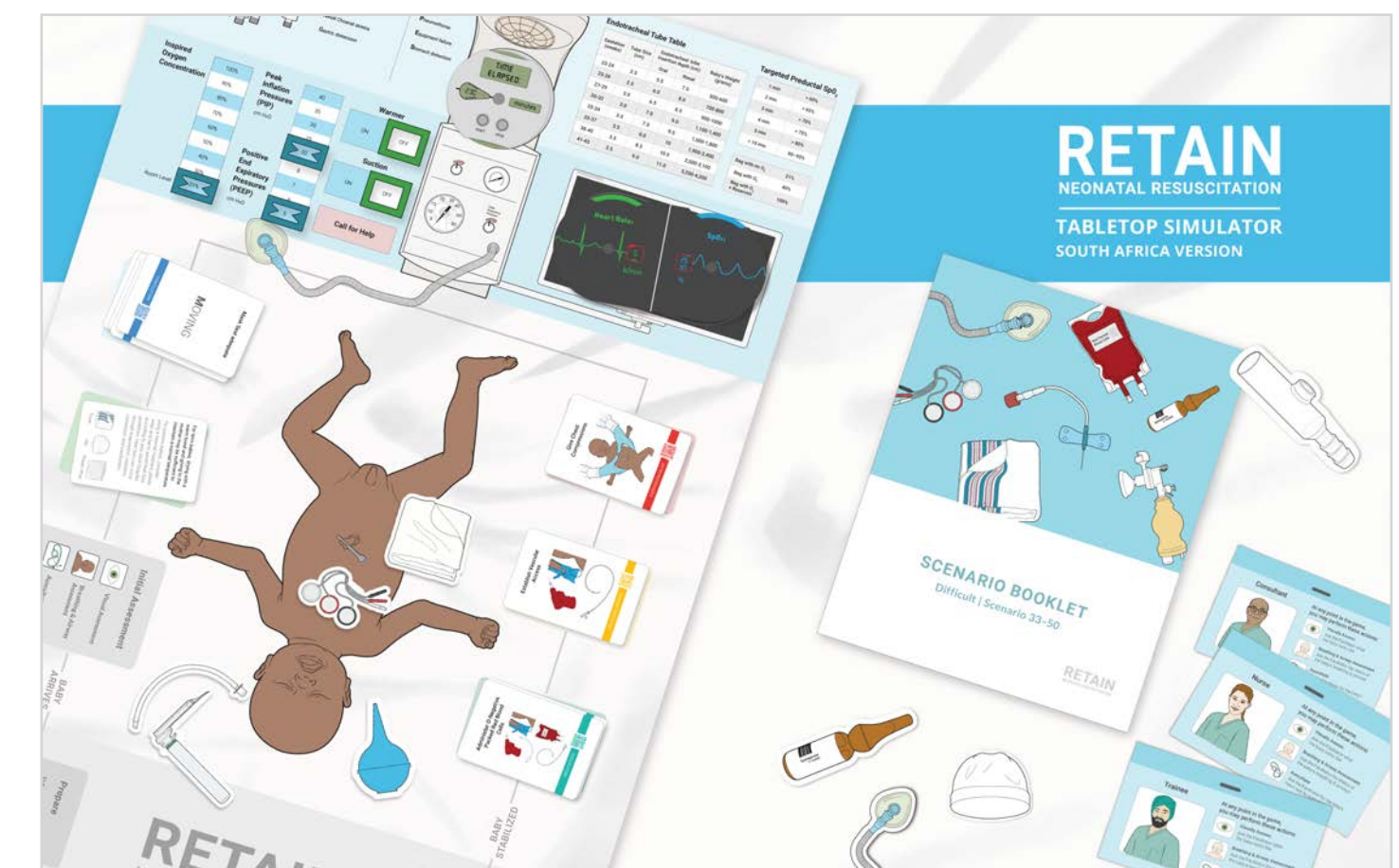
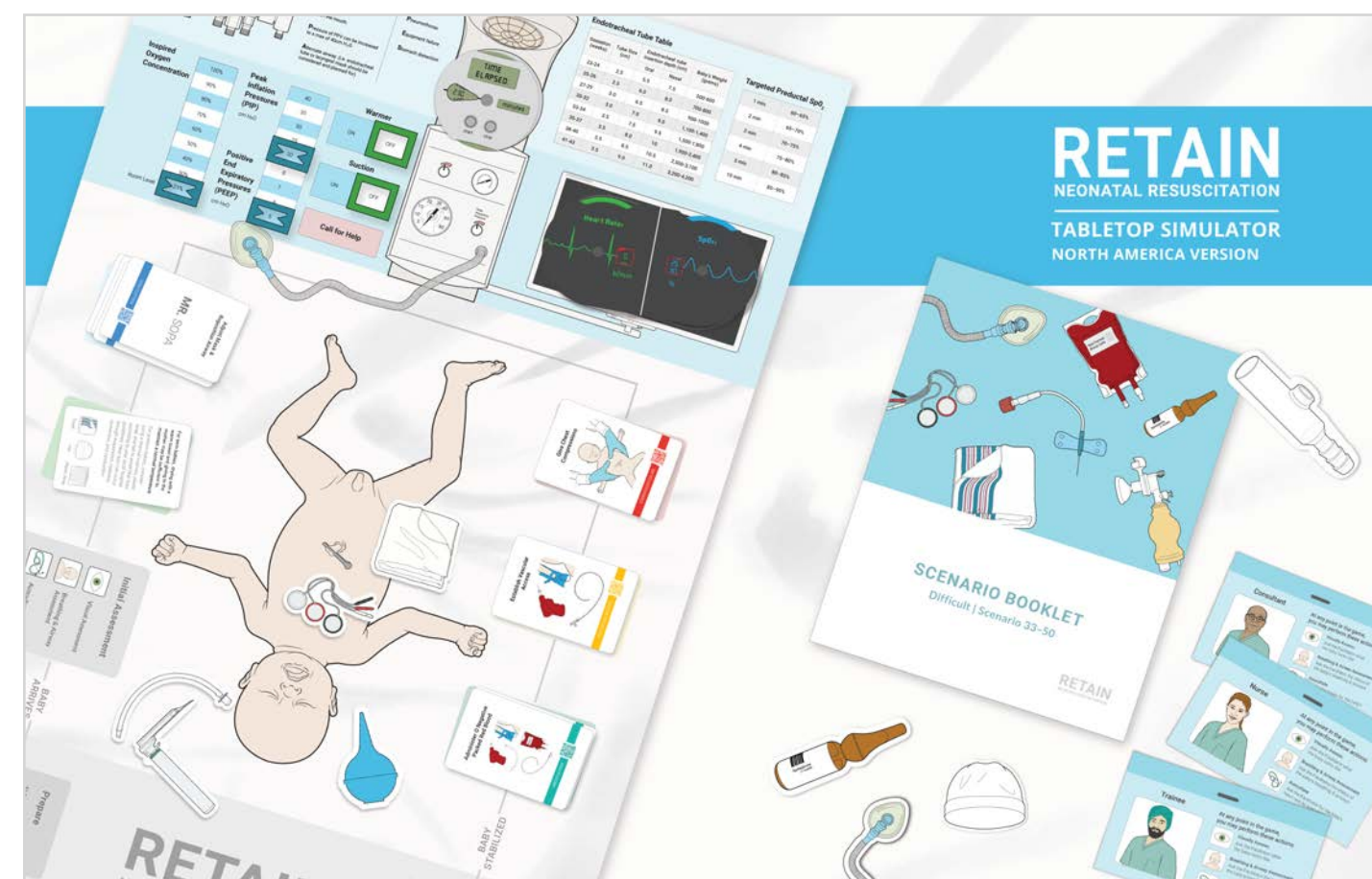
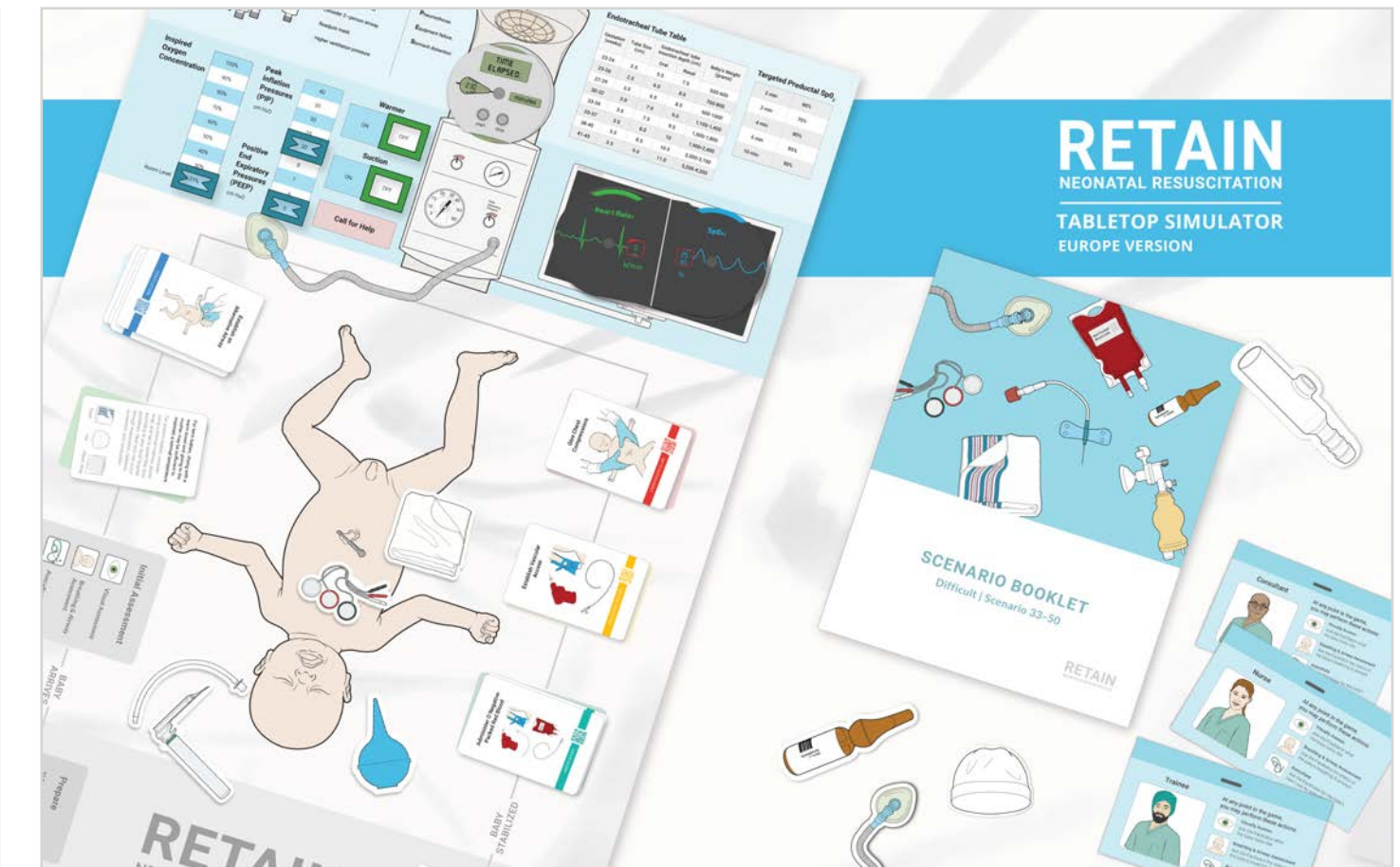
- Need someone who knows what will happen to the baby in response to an action to run the scenarios and simulations.



# Our Solution

# RETAIN

## Resuscitation Training for Healthcare Providers

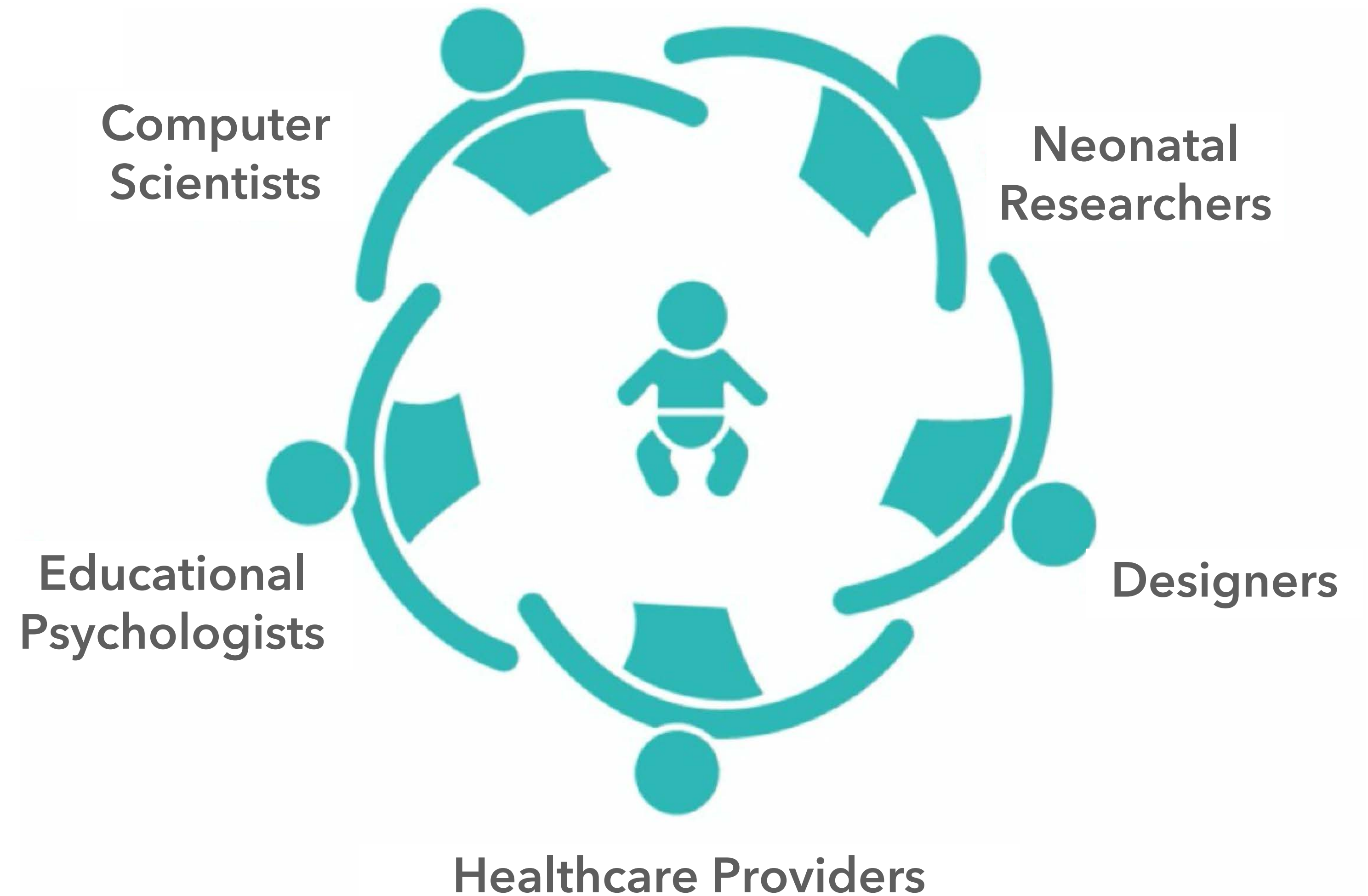


<https://retainlabsmedical.com/index.html>



# RETAIN

developed by a  
multi-disciplinary  
team





# Our Mission

To improve training of healthcare professionals  
to reduce errors and improve the life of  
newborn babies and their families



# Goals of RETAIN

- Medical errors rates during neonatal resuscitation are reported to be between **16-55%**
- Most fatal errors or medial error, which result in **poor patient outcomes** were due to **non-technical skills** like decision making, communication, and teamwork rather than technical skills like mask ventilation or chest compression depth
- The RETAIN table-top simulator **strengthens these non-technical skills**



# RETAIN

## Table-top Simulator

- Efficient and effective alternative to train non-technical skills
- Self-directed or Facilitator-directed
- A wide-range of evidence-based scenarios, based on >200 of real-life births from a high-risk perinatal center
- Low costs
- Accessible anytime and anywhere





# What is in the RETAIN Box?

## Included in the Box



1 Game Board



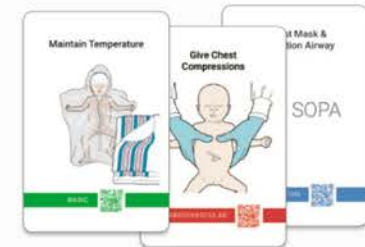
1 Instruction Manual



1 Facilitator's Guide



3 Scenario Booklets



40 Action Cards



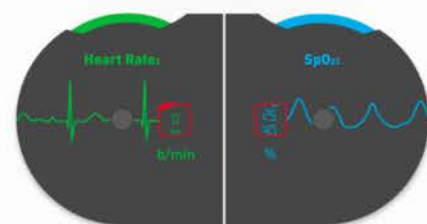
37 Supplies & Equipment



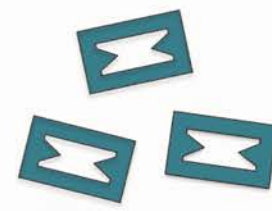
9 Persona Cards



1 Apgar Timer



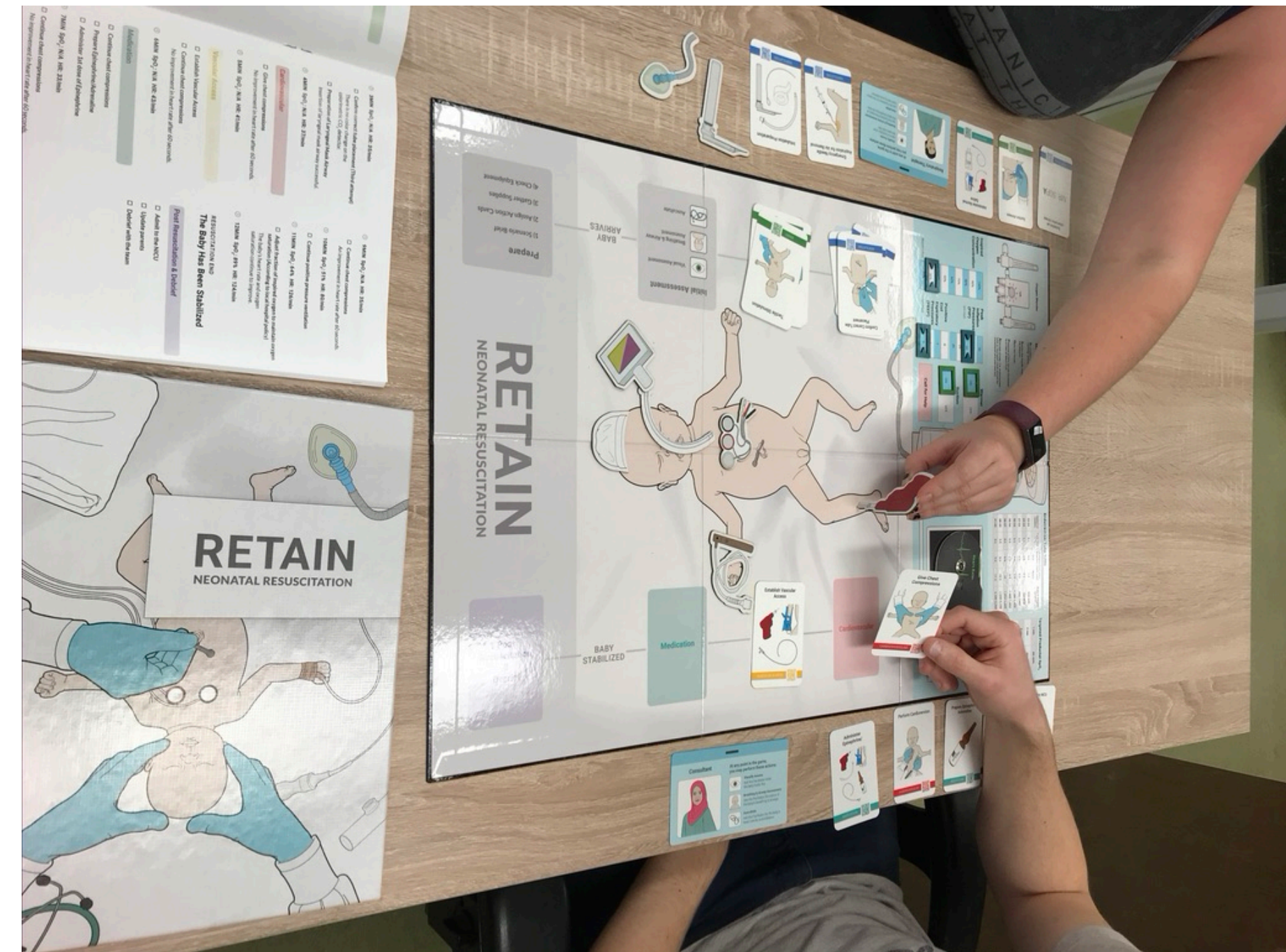
1 Heart Rate & SpO<sub>2</sub> Monitors



3 Oxygen & Pressure Scale Sliders



2 Warmer & Suction On/Off Indicators





# How does RETAIN fit into your Hospital?

RETAIN does not  
replace skills training

## Training of Non-Technical Skills

- Non-technical skills are responsible for most medial error
- Training sessions with a focus on communication, decision-making, teamwork

## Just In-Time Training

- Just in-time training improves outcomes for newborn babies at birth
- For most delivery there is not enough time practice before a delivery
- Enables in-time training prior to deliveries or emergencies
- Prepares healthcare providers for the birth of a baby as a team by practicing communication and decision making

## Bridge In-Between Training Sessions

- Healthcare providers re-certified once every two years
- Knowledge significantly decays three months after training
- Healthcare providers are underprepared to provide lifesaving clinical care
- Frequent training to maintain their competence





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# Serious games, a game changer in teaching neonatal resuscitation? A review

Simran K Ghoman,<sup>1,2</sup> Siddhi D Patel,<sup>1,3</sup> Maria Cutumisu,<sup>1,4,5</sup> Patrick von Hauff,<sup>1,6</sup> Thomas Jeffery,<sup>1,6</sup> Matthew R G Brown,<sup>1,5</sup> Georg M Schmölzer <sup>1,2</sup>

## Simulation-Based Summative Assessment of Neonatal Resuscitation Providers Using the RETAIN Serious Board Game—A Pilot Study

Simran K. Ghoman<sup>1,2</sup>, Maria Cutumisu<sup>1,2,3\*</sup>

<sup>1</sup> Neonatal Research Unit, Centre for Research in Applied Measurement and Evaluation, University of Alberta, Edmonton, AB, Canada, <sup>2</sup> Department of Pediatrics, Royal Alexandra Hospital, Alberta Health Services, Edmonton, AB, Canada, <sup>3</sup> Department of Educational Psychology, Faculty of Education, University of Alberta, Edmonton, AB, Canada, <sup>4</sup> Department of Computing Science, University of Alberta, Edmonton, AB, Canada, <sup>5</sup> Faculty of Medicine and Dentistry, Academic Technology, University of Alberta, Edmonton, AB, Canada, <sup>6</sup> Department of Pediatrics, Faculty of Medicine and Dentistry, University of Alberta, Edmonton, AB, Canada

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This article was submitted to

**Background:** Each year, approximately 1 million babies are born prematurely. Healthcare professionals are frequently evaluated to measure their knowledge and skills in neonatal resuscitation. Simulation-based education is frequently used to improve psychomotor and communication skills. However, simulation-based medical education approaches are required that are more active, more accessible and less expensive.

**Method:** Twenty neonatal resuscitation providers (Edmonton, Canada) were recruited to participate in a pilot study of one neonatal resuscitation scenario of difficulty completing the RETAIN board game. The RETAIN Labs Medical Instructional Board Game for neonatal resuscitation scenarios was used.

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### Already known on this topic?

Healthcare professionals require simulation-based education to improve psychomotor and communication skills. However, simulation-based medical education approaches are required that are more active, more accessible and less expensive.

## RETAIN: A Board Game That Improves Neonatal Resuscitation Knowledge Retention

Maria Cutumisu<sup>1,2,3</sup>, Siddhi D. Patel<sup>1,4</sup>, Matthew R. G. Brown<sup>1,3</sup>, Caroline Fray<sup>1</sup>, Patrick von Hauff<sup>1,5</sup>, Thomas Jeffery<sup>1,5</sup> and Georg M. Schmölzer<sup>1,6\*</sup>

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**Background:** The current resuscitation guidelines recommend frequent simulation based medical education (SBME). However, the current SBME approach is expensive, time-intensive, and requires a specialized lab and trained instructors. Hence, it is not offered routinely at all hospitals. We designed the board game “RETAIN” to train healthcare providers (HCPs) in neonatal resuscitation in a cost-friendly and accessible way.

## Growth Mindset Moderates the Effect of the Neonatal Resuscitation Program on Performance in a Computer-Based Game Training Simulation

Maria Cutumisu<sup>1,2,3\*</sup>, Matthew R. G. Brown<sup>4</sup>, Caroline Fray<sup>2</sup> and Georg M. Schmölzer<sup>2,5</sup>

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healthcare

Review

## The RETAIN Simulation-Based Serious Game—A Review of the Literature

Simran K. Ghoman<sup>1,2</sup> and Georg M. Schmölzer<sup>1,2,\*</sup>

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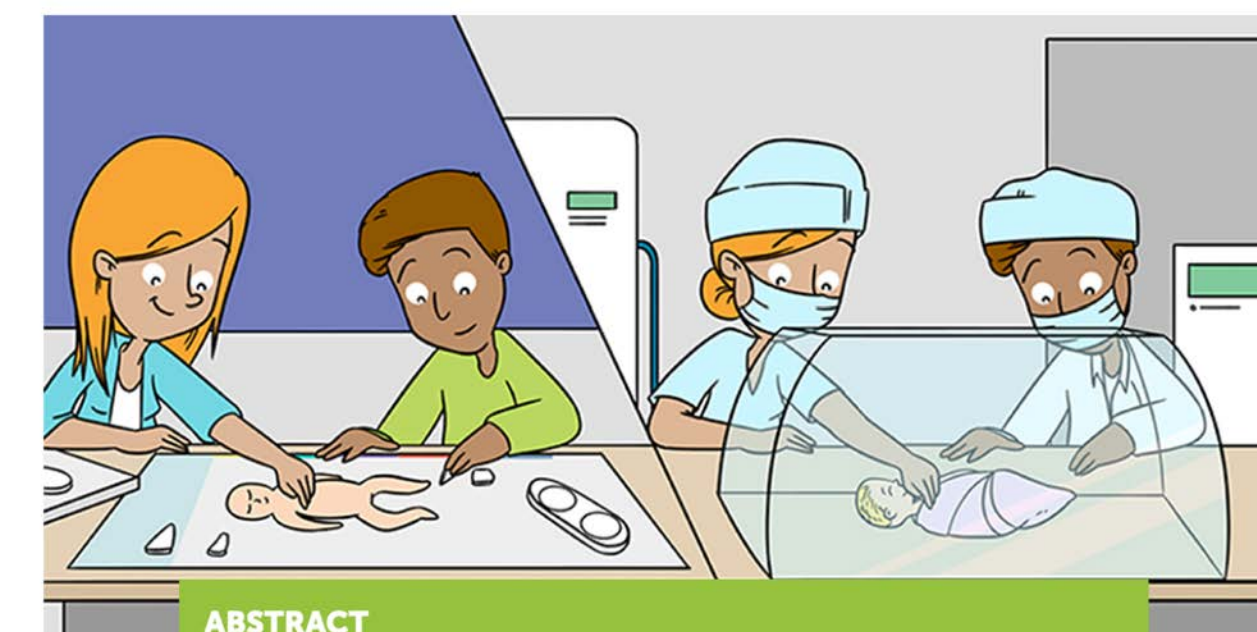
### Using Games to Train Doctors and Nurses to Save Babies at Birth

#### Authors

Simran K. Ghoman Georg M. Schmölzer

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#### ABSTRACT

For parents, the sound of their newborn baby crying is a wonderful sign that the baby is healthy and breathing. However, millions of babies each year are born sick and depend on doctors and nurses to help them start breathing. Helping a baby breathe is called neonatal resuscitation. It is important that doctors and nurses practice performing the correct steps of neonatal resuscitation so that they are ready when a newborn baby needs their help. We created the boardgame RETAIN for doctors and nurses to play, to train



# RETAIN

## supported by Research



Serious games, a game changer in teaching neonatal resuscitation? A review

Simran K Ghoman,<sup>1,2</sup> Siddhi D Patel,<sup>1,3</sup> Maria Cutumisu,<sup>1,4,5</sup> Patrick von Hauff,<sup>1,6</sup> Thomas Jeffery,<sup>1,6</sup> Matthew R G Brown,<sup>1,5</sup> Georg M Schmölzer<sup>1,2</sup>

► Additional material is published online only. To view please visit the journal online (<http://dx.doi.org/10.1136/archdischild-2019-317011>).

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**ABSTRACT**  
**Background** Neonatal healthcare professionals require frequent simulation-based education (SBE) to improve their cognitive, psychomotor and communication skills during neonatal resuscitation. However, current SBE approaches are resource-intensive and not routinely offered in all healthcare facilities. Serious games (board and computer based) may be effective and more accessible alternatives.  
**Objective** To review the current literature about serious games, and how these games might improve knowledge retention and skills in neonatal healthcare professionals.

**What is already known on this topic?**  
► Neonatal healthcare professionals require frequent simulation-based education to improve cognitive, psychomotor and communication skills during resuscitation.  
► Alternative simulation-based medical education approaches are required that are equally effective, more accessible and less resource-intensive.

## User Experience

- Neonatal healthcare providers reported that RETAIN was **clinically valid, engaging,** and **conveyed important aspects** of neonatal resuscitation
- 95% stated RETAIN it useful for training neonatal resuscitation.

## Knowledge Improvement

- After one RETAIN training session adherence (i.e., 100% correct) to the correct steps on neonatal resuscitation increased by **36%**
- **Knowledge improvement** was sustained 2 and 5 months after the initial session
- Knowledge decay occurs after 3 months after traditional simulation training

## Assessment

- RETAIN table-top can be used as an assessment tool to evaluate healthcare providers’ competence
- Allows to focus on individual weaknesses of healthcare providers

# Anticipated Impacts of RETAIN

- 1 Million newborn babies who need resuscitation die each year around the world.
- 66% of these deaths are related to deficiencies in healthcare providers knowledge and communication (660,000 babies).
- RETAIN improves healthcare providers' ability to safely and correctly provide resuscitation care by 36%.
- RETAIN has the potential to save the lives of more than 230,000 newborn babies each year.









Everyone deserves the best start to life.

Through **RETAIN**, we hope to transform the future of communities around the world, by **improving care for babies at birth.**





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