

# Simulation in der Kinder- anästhesie

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Anästhesiekongress | SIGA / FSIA | Congrès d'anesthésie  
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# news? trends & updates



Schweizerische Interessengemeinschaft für Anästhesiepflege  
Fédération suisse des infirmières et infirmiers anesthésistes  
Federazione Svizzera Infermiere e Infermieri anestesisti

5 Credits  
SIGA/FSIA  
SIGA/FSIA



Special speaker: Thomas Bucheli

Traduction française simultanée



# trends & updates





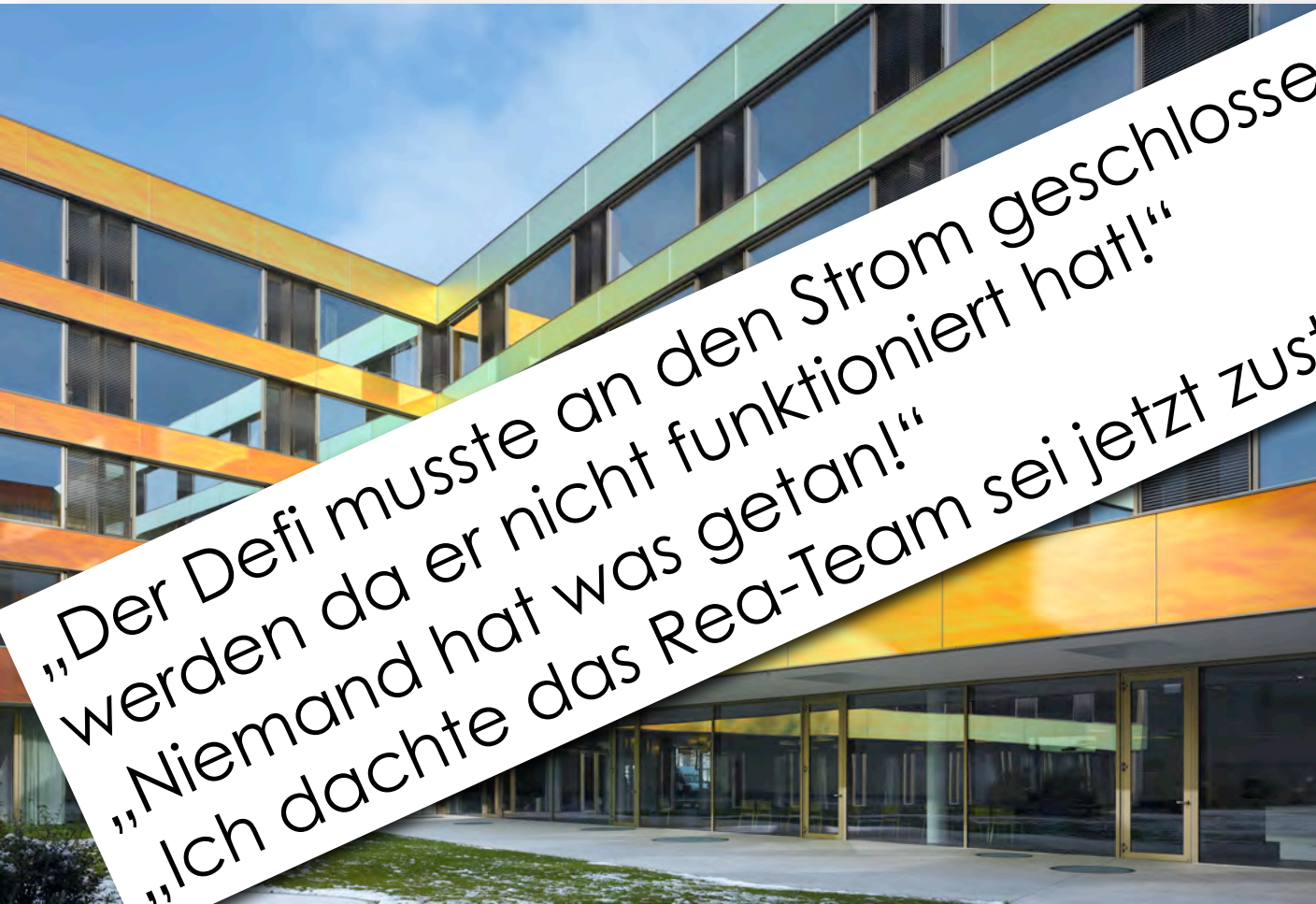
# Boston 2003



# Los Angeles 2007



# Basel 2014



„Der Defi musste an den Strom geschlossen werden da er nicht funktioniert hat!“

„Niemand hat was getan!“

„Ich dachte das Rea-Team sei jetzt zuständig!“

# Wo happert es?

nicht erkennen

nicht entscheiden

nicht kommunizieren

nicht wissen was der andere tut

# S<sub>wiss</sub> C<sub>atalogue</sub> O<sub>bjectives</sub> A<sub>nesthesia</sub> R<sub>eanimation</sub>

During the course of their training, anesthesia residents must acquire non-technical abilities to master interpersonal and organizational tasks during the perioperative care of patients. These include the following competences:

	<u>Competence statement</u>		
1.7.1	Develops and maintains an overall dynamic view of the situation based on perception of the operating room environment, continuous monitoring and assessment of patient status, and means and methods for patient safety.		
1.7.2	Plans and organizes the perioperative care of the patient to achieve short-term and long-term goals.	B	C
1.7.3	Coordinates and supports the team to ensure effective joint task completion and team satisfaction.	B	C

**Situation Awareness:** (er)kennen, interpretieren, antizipieren  
**Task Management:** planen, vorbereiten, priorisieren,  
**Decision Making:** optionen, risiko/nutzen  
**Teamworking:** koordinieren, unterstützen, kommunizieren, führen



# Simulation für...



## Benimm-Training

# Besser durch Simulation

Anesthesiology 2005; 103:241-8

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## ***Nontechnical Skills in Anesthesia Crisis Management with Repeated Exposure to Simulation-based Education***

*Bevan Yee, M.B.Ch.B., F.A.N.Z.C.A.,\* Viren N. Naik, M.D., M.Ed., F.R.C.P.C.,† Hwan S. Joo, M.D., F.R.C.P.C.,‡  
Georges L. Savoldelli, M.D.,§ David Y. Chung, M.B.B.S., F.A.N.Z.C.A.,\* Patricia L. Houston, M.D., M.Ed., F.R.C.P.C.,||  
Bruce J. Karatzoglou, B.Sc., R.R.C.P.,# Stanley J. Hamstra, Ph.D.\*\**

Benehmen verbessert sich ( $p < 0.005$ )

# In der Chirurgie: ja!

## The Impact of Nontechnical Skills on Technical Performance in Surgery: A Systematic Review

[Louise Hull](#), MSc , [Sonal Arora](#), PhD, MRCS, [Rajesh Aggarwal](#), PhD, FRCS, [Ara Darzi](#), MD, FACS, [Charles Vincent](#), PhD, [Nick Sevdalis](#), PhD

Department of Surgery and Cancer, Imperial College London, London, United Kingdom

Performance verbessert sich ( $p < 0.001$ )



# Simulation für...



## Skill-Training

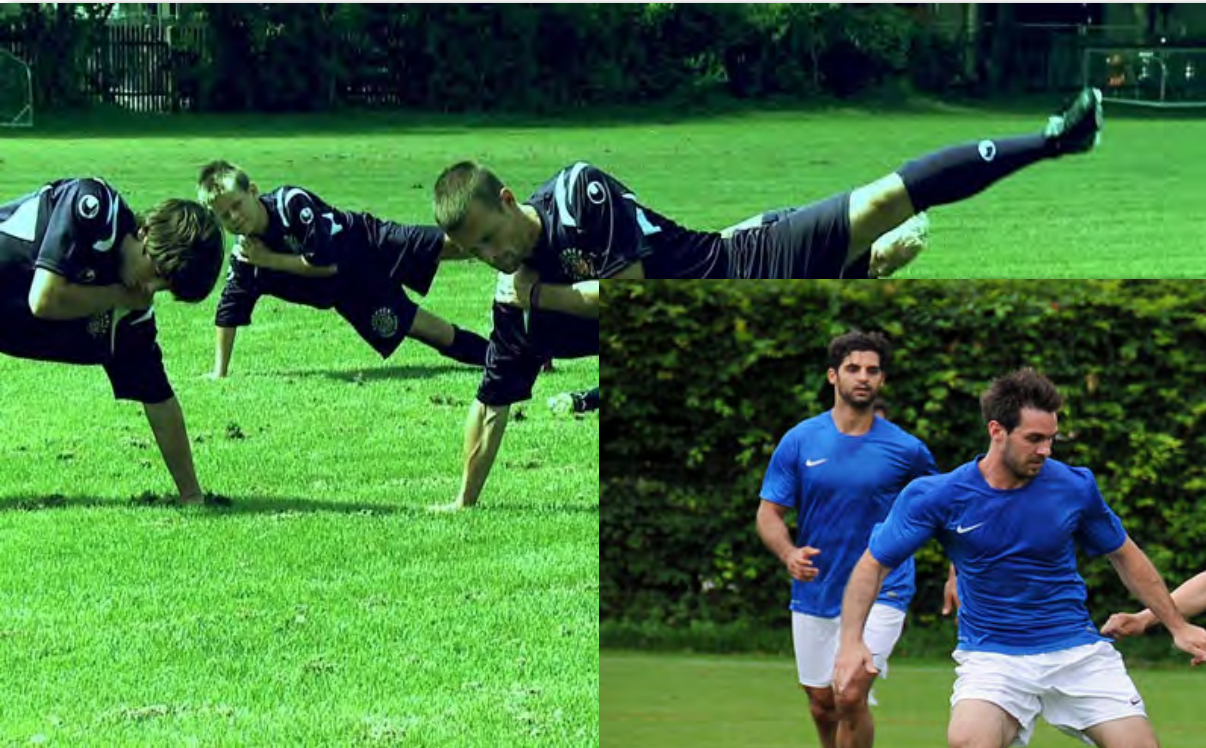


# Ja!



LP Halamek. Pediatrics 2000  
WJ Eppich. Curr Opin Pediatr 2005  
C Eich. Br J Anaesth 2006

# Simulation für...



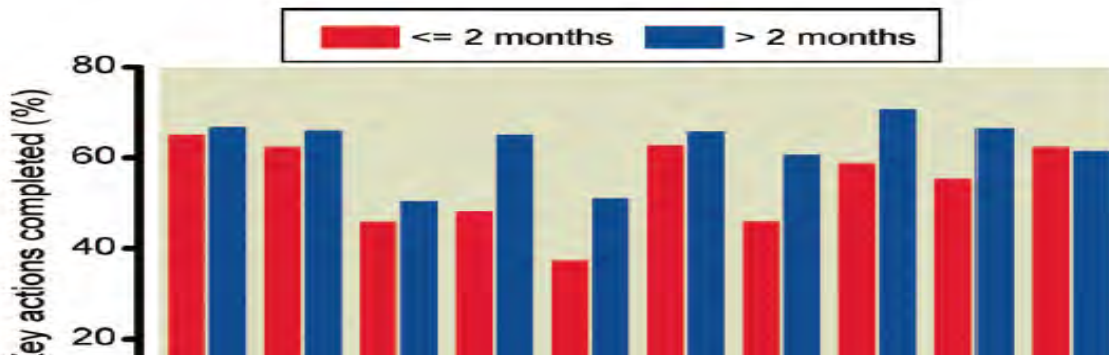
Training



Assessment

## Simulation-based Assessment of Pediatric Anesthesia Skills

James J. Fehr, M.D., F.A.A.P.,\* John R. Boulet, Ph.D.,† William B. Waldrop, M.D.,‡  
Rebecca Snider, M.H.S., R.N.,§ Megan Brockel, M.D.,|| David J. Murray, M.D.##



Die Simulation eignet sich die Kompetenz des Anästhesisten zu bewerten

Fig. 1. Mean key action scores by scenario and pediatric anesthesia experience. The total key action scores out of 100% for the simulation scenarios for each group of trainees with either less (red bars) or more (blue bars) than 2 months of pediatric anesthesia training.



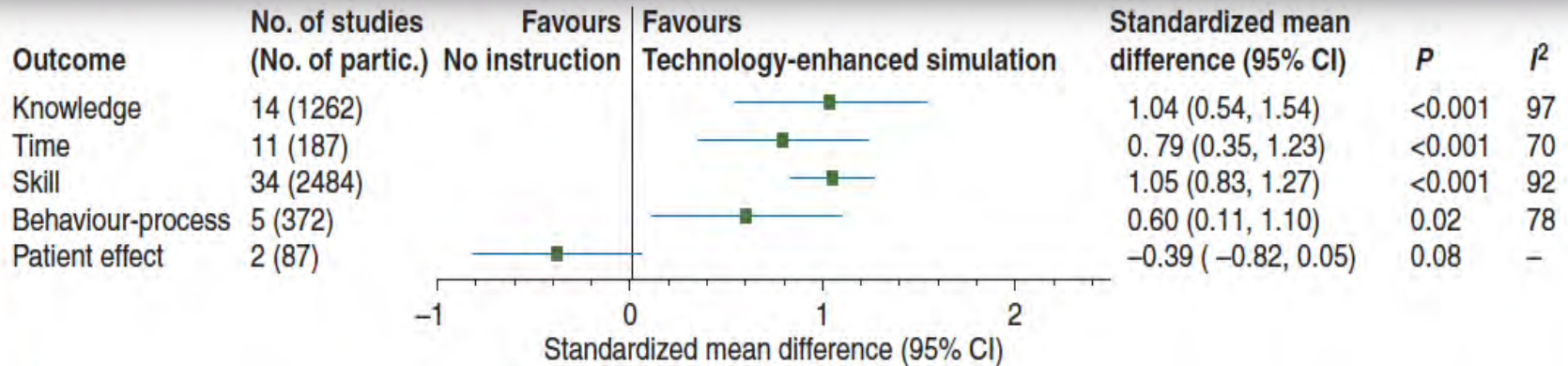
# Simulation vs „nichts“

## Simulation-based Training in Anaesthesiology



### A Systematic Review and Meta-analysis

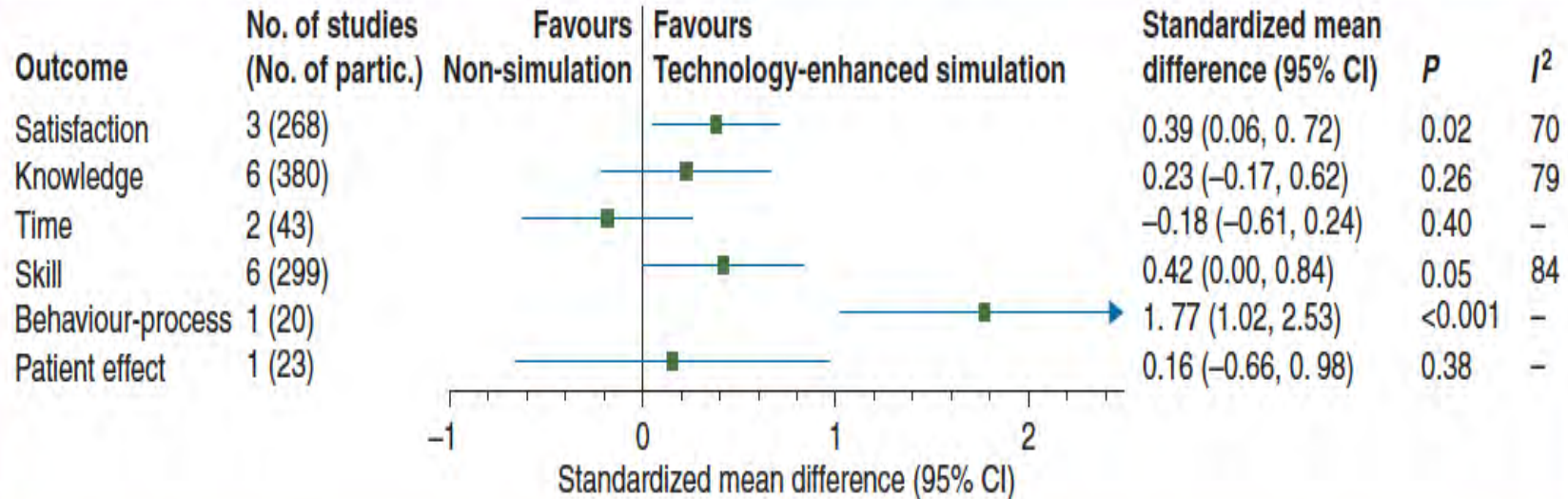
G. R. Lorello, D. A. Cook, R. L. Johnson, R. Brydges |  
 Br J Anaesth. 2014;112(2):231-245.



**Fig 2** Random-effects meta-analysis of comparisons between simulation-based training and no intervention (positive numbers favour simulation): knowledge, time, skill, behaviour, and patient outcomes.



# Simulation vs Instruktion



**Fig 4** Random-effects meta-analysis of comparisons between simulation-based and non-simulation instruction (positive numbers favour simulation): satisfaction, knowledge, time, skill, behaviour, and patient outcomes.

# Simulator/Equipment



Darfs auch primitiv sein?



# Die Banane







**RESULTS** Both HFS and LFS learning resulted in consistent improvements in performance in comparisons with no-intervention control groups. However, nearly all the studies showed no significant advantage of HFS over LFS, with average differences ranging from 1% to 2%.



# Welche Realität?



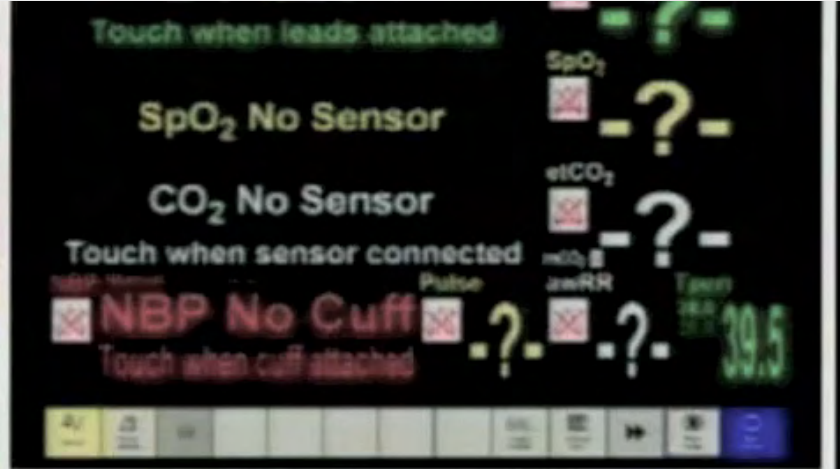
equipment

environment

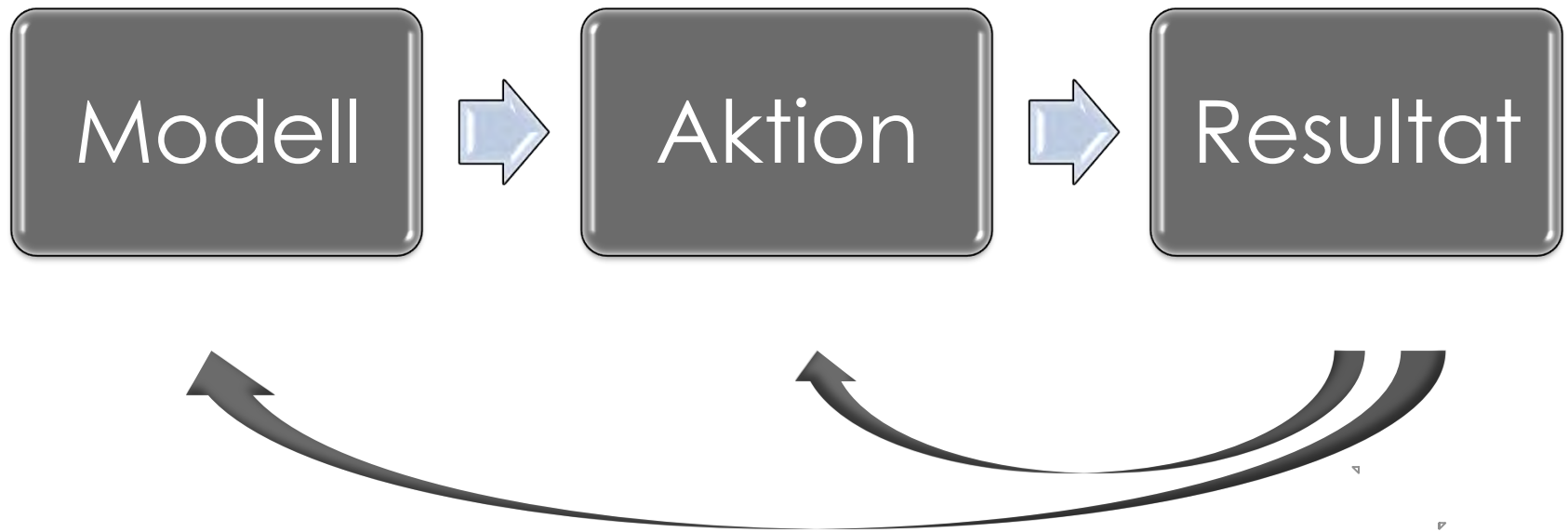
psychological

mehr Realität für komplexere skills

# Video SIMCKA: Eltern



# Debriefing





# Gut



# Böse

Cool-Clip.de

"Twenge does a huge, decidedly un-GenX amount of research and replaces [hunches] with actual data . . . Lucid and entertaining . . . bold . . . refreshing."  
—Chris Colin, author of *What Really Happened to the Class of '93*



Why Today's Young Americans Are More  
Confident, Assertive, Entitled—  
and More Miserable Than Ever Before

Jean M. Twenge, PhD.



# Generation Ich (Me!)

Diese Studenten machen die Dinge lieber als dazusitzen und zuzuhören. Sie reagieren auf Bilder und Videos.

Professoren die diese Techniken in ihre Vorlesung einfügen erleichtern das Lernen dieser Studentengeneration

# Work Life Balance



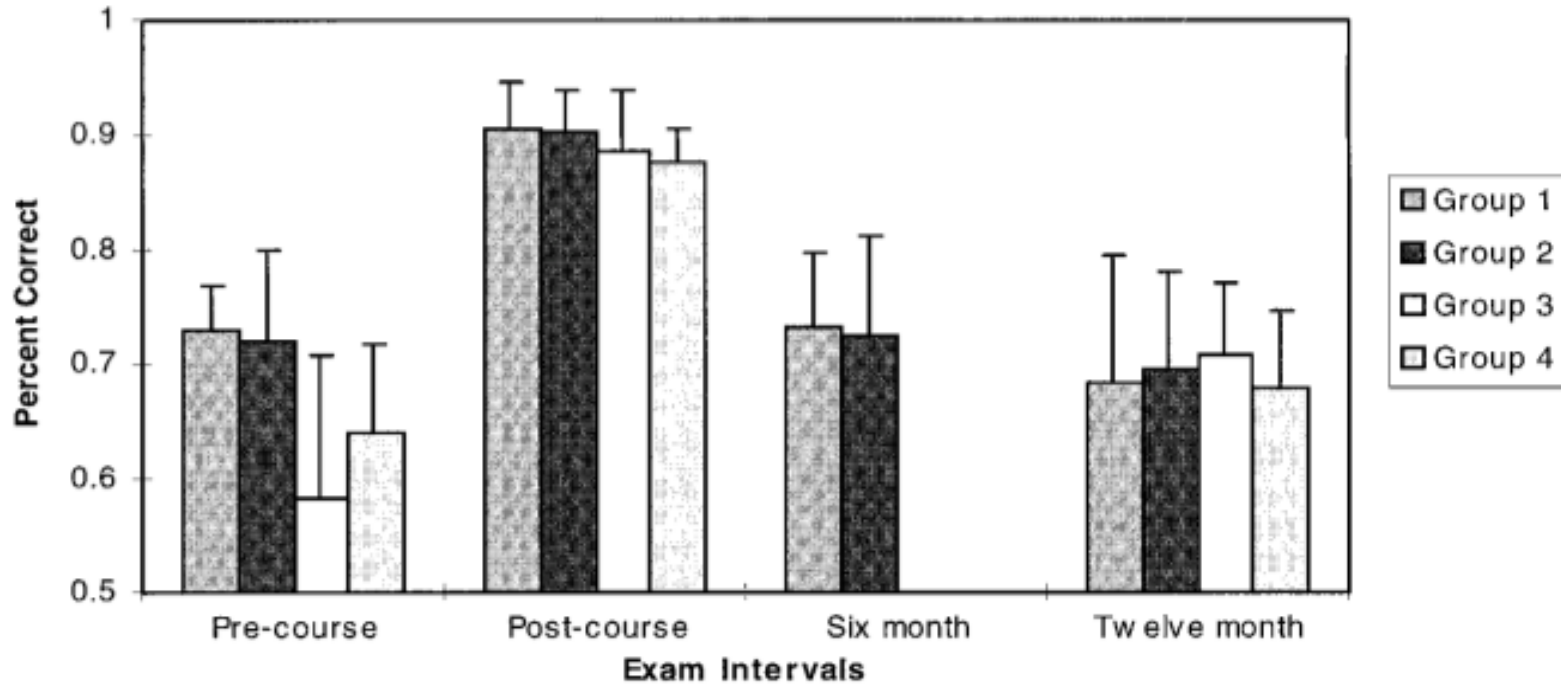
# Simulation

- Realität
- Teamtraining
- Mastery Learning
- Repetitives Üben
- Gezieltes Üben
- Angepasstes Üben
- Feedback

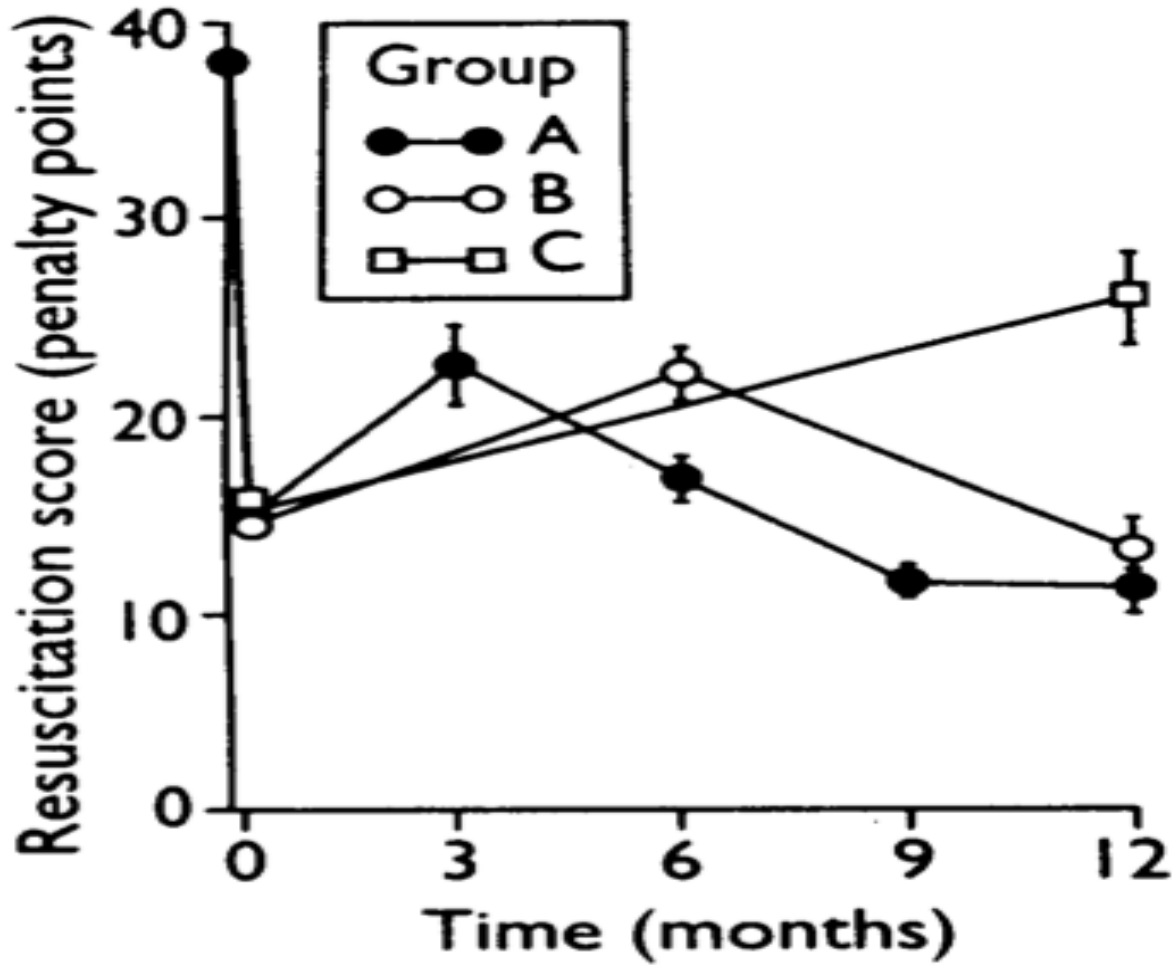




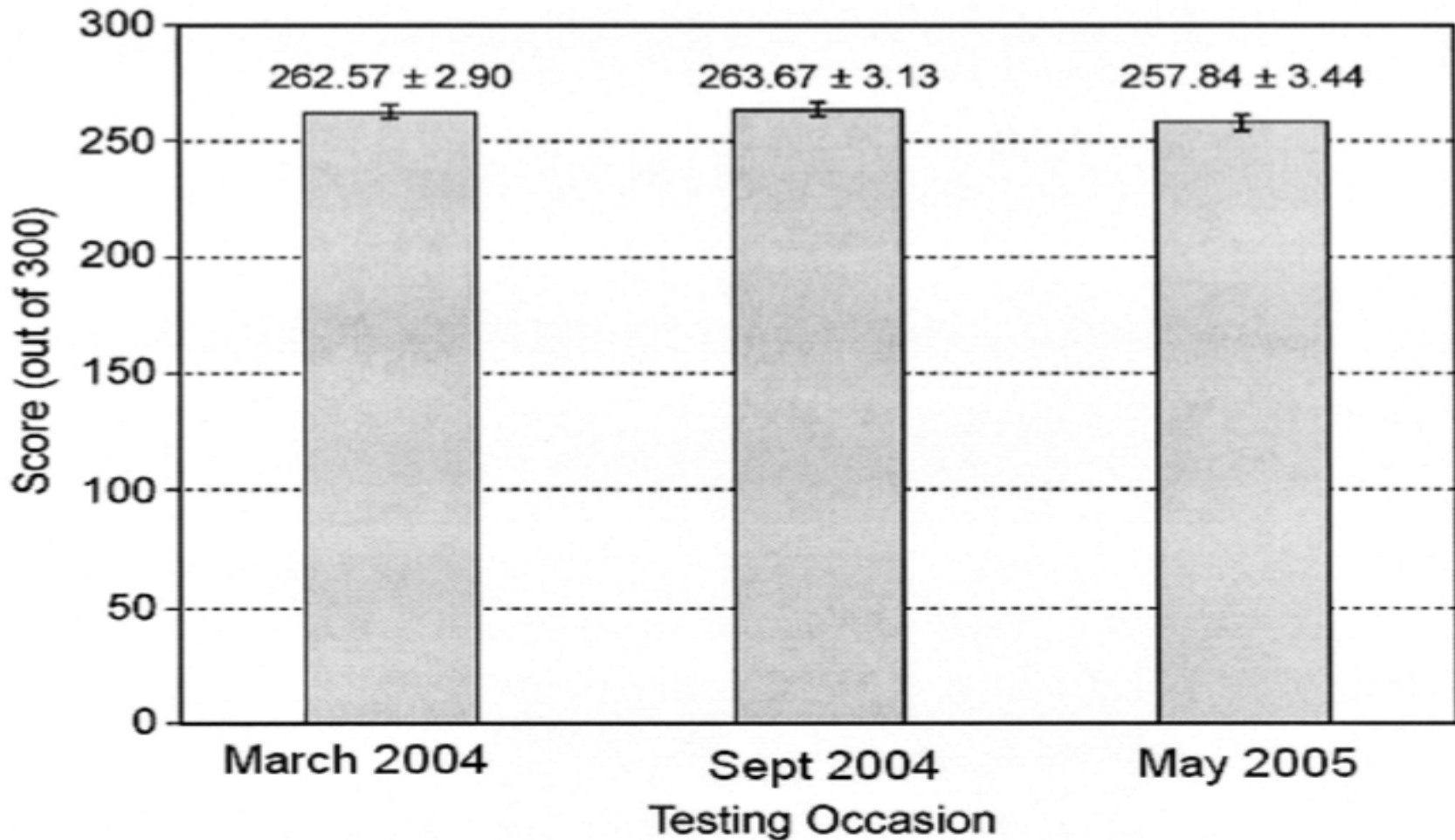
# Zerfall



# mehr Zerfall



# ...mit Simulation





news



# Simulation für...



Training



Assessment

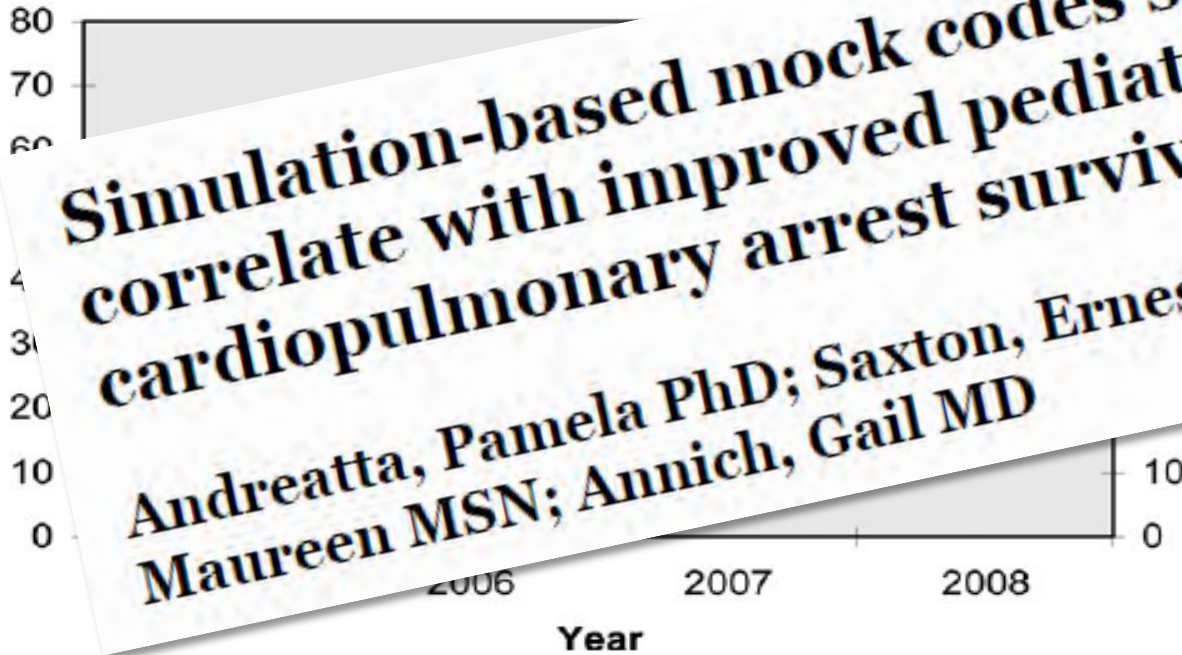
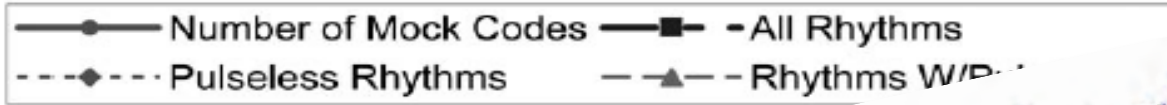
Simulation für...



Outcome???



## CPA Survival Rates Related to Mock Codes

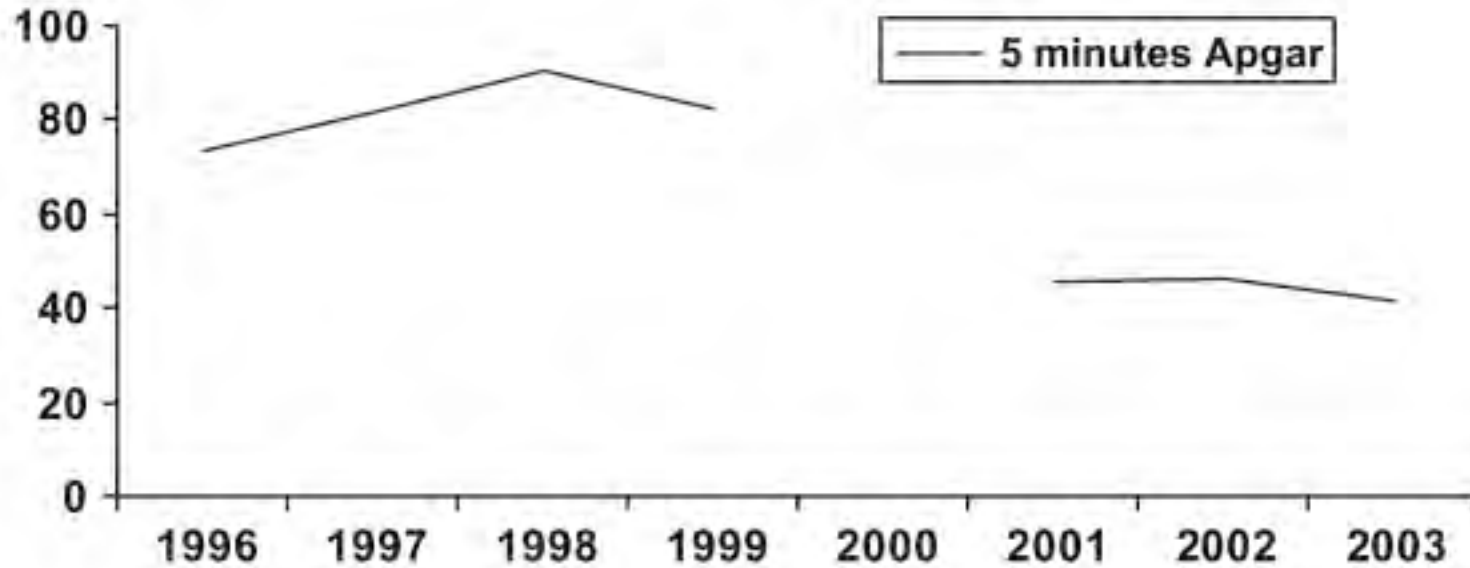


**Simulation-based mock codes significantly correlate with improved pediatric cardiopulmonary arrest survival rates\***

**Andreatta, Pamela PhD; Saxton, Ernest BSN; Thompson, Maureen MSN; Annich, Gail MD**



# APGAR, Ischämie



**Figure 2.** Graph demonstrating the number of low Apgar's pre- and post-training.

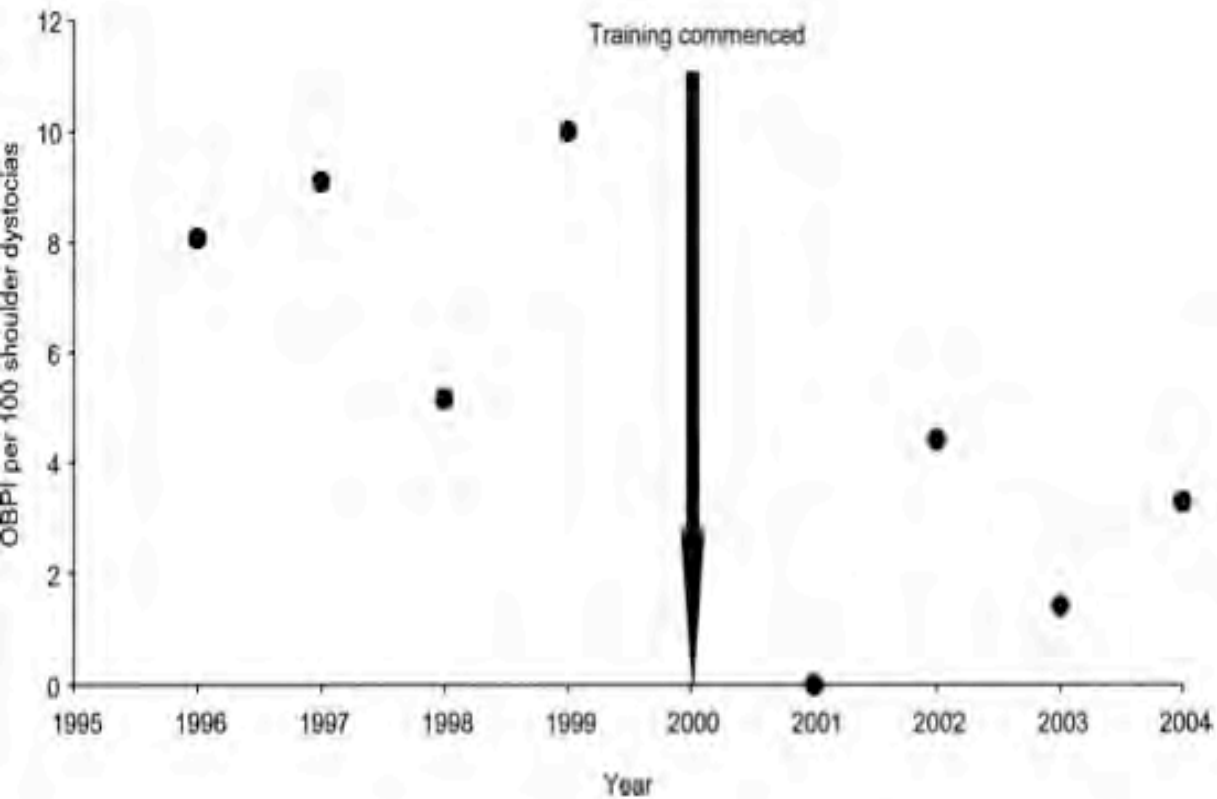


Fig. 3. Obstetric brachial plexus injuries (OBPIs) associated with shoulder dystocia per year.

# Simulation-Based Education

- Express
- MEPA
- SIMCKA/SIMPA

# EXPRESS

## EXamining Pediatric Resuscitation Education using Simulation and Scripting

Theoretische Kenntnisse: 5.3 vs 3.6%

Teamverhalten: 16 vs 8%

Klinische Performance: 7.9 vs 6.7%



# MEPA

## Managing Emergencies in Paediatric Anaesthesia



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# SIMCKA



## Tagesklinik

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**Tagesklinik**

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An der Tagesklinik stehen für ambulante Untersuchungen und Eingriffe insgesamt 13 Betten zur Verfügung. Jährlich werden über 2000 Kinder betreut.

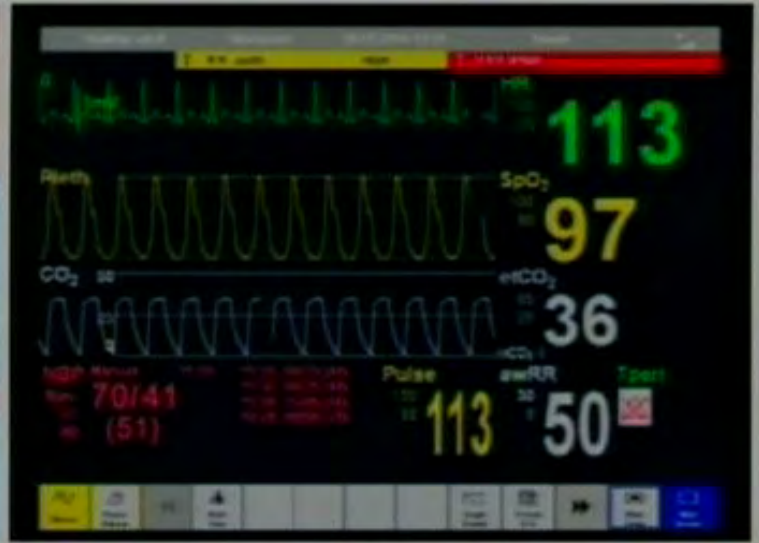


# SIMCKA

- 1: Inhalative Anästhesieeinleitung: Laryngealmaske
  - 2: Inhalative Anästhesieeinleitung: Relaxation Intubation
  - 3: Intravenöse Anästhesieeinleitung: Rapid Sequence Induction
  - 4: Elternpräsenz: Kinderreanimation
  - 5: Atemwegsobstruktion: Laryngospasmus
  - 6: Atemwegsobstruktion: Bronchospasmus
  - 7: Hypovolämie: Sepsis
  - 8: Hypovolämie: Trauma
  - 9: Intraoperative Komplikation: iatrogene Extubation
  - 10: Intraoperative Komplikation: Anaphylaxie
  - 11: Postoperative Apnoe: Fremdkörper
  - 12: Postoperative Apnoe: Relaxansüberhang
  - 13: Neugeborenenrea: Weisse Asphyxie
-



# Video

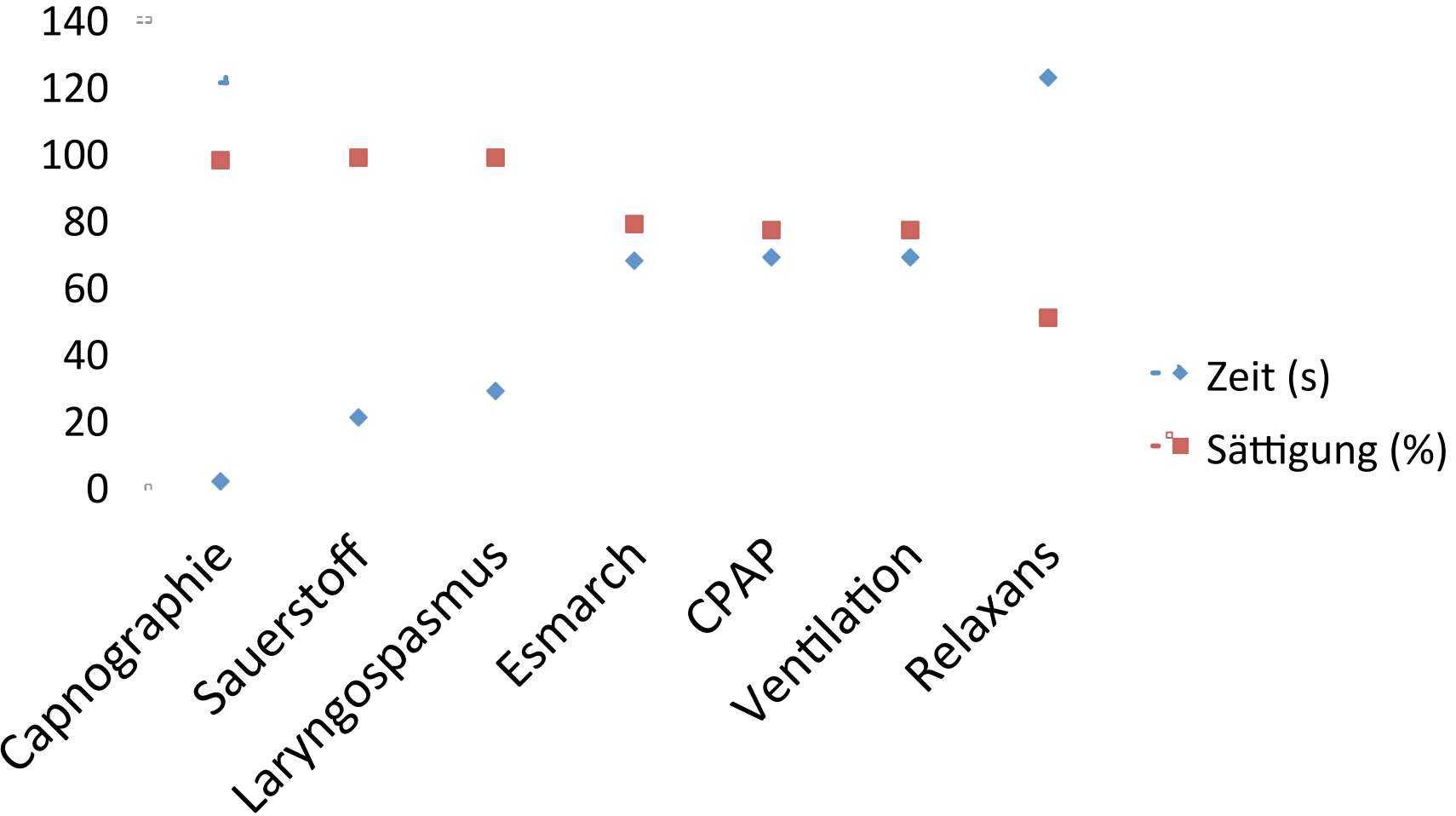




# Video SIMCKA



# Handlungen



# Take home



Simulieren  
Immer wieder  
Vernetzen

# Sim-Baby fliegt...



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