The Paedsim® Concept: A Simulation-Based Model for Interdisciplinary and Multi-Professional Training of Pediatric Emergency Teams

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Background
Confrontations with critically ill newborns, infants and small children are rare and pose a particular challenge for the medicating team. Pediatric providers are universally challenged with the extremes of age, different sizes of devices and dosage calculations in this heterogeneous patient population. As a first step, cognitive and technical competencies must be acquired and subsequently reinforced by continuous educational training. There is further need to bolster pediatric education by integrating a realistic environment for coping with stress and acquiring team attitudes. Simulation technology is recognized for establishing and maintaining pediatric critical skills. Moreover, it promotes experience-based learning in a safe and supervised environment. Simulation-based learning is acknowledged as effective and lasting (1).

Paedsim® Course Concept
Paedsim was developed by an international working-group consisting of medical professionals and educationalists (2). Course concept is structured on a modular curriculum for standardized pediatric emergency care. Simulation technique is the principal educational strategy for training team attitudes and communication skills. Role playing of parental presence simulates the real and stressful environment of pediatric emergencies. After experiencing a simulated encounter of a critically ill or injured child, immediate video-assisted and structured feedback on task management and team performance is given. Thereby, a new learning domain, where key improvements are still needed, is established. In addition to simulations, skill stations and lectures are held during the 16-hour course. Groups are composed of interdisciplinary and multi-professional participants.

Paedsim® Course Evaluation
Course evaluation is performed as a self-assessment by the participants who complete a questionnaire before and immediately after the course. The 34 questions correspond to the overall course satisfaction and the participant’s estimation of either his technical skills or his awareness of his non-technical skills in pediatric emergency care. The non-technical skills include markers for safety culture, team behavior and communication. Markers for technique were pediatric resuscitation skills, venous access and algorithms for specific pediatric emergencies. Participant’s course satisfaction and self-assessment scoring were made on a 6-point Likert scale (1 = very bad, resp. no familiarity, 6 = excellent, resp. very familiar with referred skill). Data of 22 participants were analyzed. After the course, self-assessment of non-technical skills and technical skills improved by 10% (0.5, mean value) and 24% (1.2, mean value), respectively (Fig 1).

Improvement of technical skills was statistically significant. Course satisfaction rating including course content in general, theoretical lectures, skill stations and simulation was excellent (Fig 2).

Conclusion
The Paedsim course concept is a valid curricular addition to the algorithm-based learning of pediatric emergency care. Using simulation technology, the Paedsim concept includes learning of team behavior and interaction in a safe and close-to-reality environment. Course evaluation shows excellent satisfaction with course content and improvement of both participant’s self-assessment of his non-technical and technical skills. Nevertheless, course concept has little impact on non-technical skills. The explanation may be that course content does not sufficiently include the non-technical skill domain or that the evaluation questions do not address it adequately. Further research is needed to establish whether simulation training supports effective and life-long learning. In addition, there is need to demonstrate the advancements of team behavior to improve team performance and to ultimately save children’s lives.

References
2. www.paedsim.org; accessed September 14, 2012