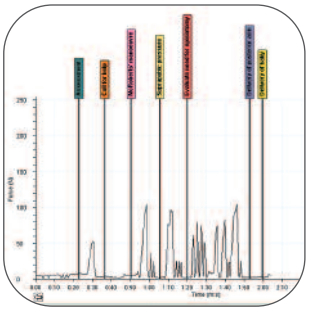
Limbs & Things

PROMPT Birthing Simulator Evaluation Studies






Training for Shoulder Dystocia

A Trial of Simulation Using Low-Fidelity and High-Fidelity Mannequins

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OBJECTIVE: To evaluate the effectiveness of simulation training for shoulder dystocia management and compare training using a high-fidelity mannequin with that using traditional devices.

METHODS: Training was undertaken in six hospitals and a medical simulation center in the United Kingdom. Midwives and obstetricians working for participating hospitals were eligible for inclusion. One hundred forty participants (45 doctors, 95 midwives) were randomized to training with a high-fidelity training mannequin (incorporating force perception training) or traditional low-fidelity mannequins. Performance was assessed pre- and posttraining, using a videoed, standardized shoulder dystocia simulation. Outcome measures were delivery, head-to-body delivery time, use of appropriate and inappropriate actions, force applied, and communication.

RESULTS: One hundred thirty-two participants completed the posttraining assessment. All training was associated with improved performance: use of basic maneuvers 114 of 140 (81.4%) to 125 of 132 (94.7%) ($P=.002$), successful deliveries 60 of 140 (42.9%) to 110 of 132 (83.3%) ($P<.001$), good communication with the patient 79 of 139 (56.8%) to 109 of 132 (82.6%) ($P<.001$), pre- and post-training, respectively. Training with the high-fidelity mannequin was associated with a higher successful delivery rate than training with traditional devices: 94% compared with 72% (odds ratio 6.53, 95% confidence interval 2.05–20.81; $P=.002$). Total applied force was significantly lower for those who had undergone force training (2,030 Newton seconds versus 2,916 Newton seconds; $P=.006$) but there was no significant difference in the peak applied force 102 Newtons versus 112 Newtons ($P=.242$).

CONCLUSION: This study verifies the need for shoulder dystocia training; before training only 43% participants could achieve delivery. All training with mannequins improved the management of simulated shoulder dystocia. Training on a high-fidelity mannequin, including force perception teaching, offered additional training benefits.

LEVEL OF EVIDENCE: I

Pattern and degree of forces applied during simulation of shoulder dystocia

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OBJECTIVE: The objective of the study was to determine the level and pattern of forces applied during simulated shoulder dystocia.

STUDY DESIGN: One hundred forty staff (95 midwives, 45 obstetricians) were randomized from 6 UK hospitals. Applied delivery force was measured during a standardized simulated shoulder dystocia. Maximum, average, total, and applied force gradients were calculated for each delivery.

RESULTS: There was a wide range for all force variables: geometric mean maximum applied force 106 newtons (N) (range 6 to more than 250, n = 113), maximum force gradient 45 N/s (range 2-249, n = 113), total applied force 2954 N/s (range 33 to 14,197, n = 108), and average applied force 16 N (range 0-68, n = 108).

CONCLUSION: Despite participants managing the same scenario, there was great variation in the pattern and degree of traction used. High forces were applied during two thirds of simulations. Training must emphasize that maneuvers should be used to overcome shoulder dystocia while minimizing iatrogenic applied force.

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This study was part of the SaFE Study (Simulation and Fire-Drill Evaluation), which was funded by the Patient Safety Research Programme of the Department of Health of England and Wales. The study was conducted in: Cheltenham, Gloucestershire, UK; Gloucester, Gloucestershire, UK; Bristol, Bristol, UK; Taunton, Somerset, UK; Exeter, Devon, UK; and Truro, Cornwall, UK

Management of shoulder dystocia: skill retention 6 and 12 months after training

Crofts JF, Bartlett C, Ellis D, Hunt LP, Fox R, Draycott TJ

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OBJECTIVE: To assess skill retention 6 and 12 months after shoulder dystocia training.

METHODS: Midwives and doctors from six United Kingdom hospitals attended a 40-minute workshop on shoulder dystocia management. Participants managed a standardized simulation before and 3 weeks, 6 months, and 12 months afterward. Outcome measures were delivery, head-to-body delivery time, performance of appropriate actions, force applied, and quality of communication.

RESULTS: A total of 122 participants were recruited. One hundred eighteen were evaluated 3 weeks posttraining, for whom follow-up was available for 95 (81%) at 6 months and 82 (70%) at 12 months. Before training, 60 of 122 (49%) achieved delivery, 97 of 118 (82%) were able to deliver after initial training, 80 of 95 (84%) were able to deliver at 6 months, and 75 of 82 (85%) were able to deliver at 12 months. Twenty-one (18%) who could not deliver 3 weeks after training were offered additional training; of these, 11 of 14 (79%) achieved delivery at 12 months. Among those who could deliver 3 weeks posttraining, there was no deterioration in the performance of basic actions, delivery interval, force application, and patient communication. Those who were proficient before initial training performed best at follow-up, but skill retention was also good in those who learned to deliver during initial training. Eighteen percent could not deliver after initial training and required additional individualized tuition; the large majority retained their newly acquired skills at 6 and 12 months.

CONCLUSION: Overall, training resulted in a sustained improvement in performance. Annual training seems adequate for those already proficient before training, but more frequent rehearsal is advisable for those initially lacking competency until skill acquisition is achieved.

LEVEL OF EVIDENCE: II

Shoulder dystocia training using a new birth training mannequin

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ABSTRACT: Shoulder dystocia 'skill drills' are a requirement for the Maternity CNST standards. However, there is, as yet, no evidence that training in the management of shoulder dystocia improves outcome. We developed a mannequin for training and investigated its effectiveness. The management of shoulder dystocia improved following training with the mannequin. There was a reduction in the head-to-body delivery duration, and the maximum applied delivery force, following training; however, these did not reach statistical significance. After training no subject applied a delivery force of greater than 100 N, a level above which fetal injury has been shown to occur.

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Improving Neonatal Outcome Through Practical Shoulder Dystocia Training

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Obstetrics & Gynecology 2008;112:14-20.

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OBJECTIVE: To compare the management of and neonatal injury associated with shoulder dystocia before and after introduction of mandatory shoulder dystocia simulation training.

METHODS: This was a retrospective, observational study comparing the management and neonatal outcome of births complicated by shoulder dystocia before (January 1996 to December 1999) and after (January 2001 to December 2004) the introduction of shoulder dystocia training at Southmead Hospital, Bristol, United Kingdom. The management of shoulder dystocia and associated neonatal injuries were compared pretraining and posttraining through a review of intrapartum and postpartum records of term, cephalic, singleton births in which difficulty with the shoulders was recorded during the two study periods.

RESULTS: There were 15,908 and 13,117 eligible births pretraining and posttraining, respectively. The shoulder dystocia rates were similar: pretraining 324 (2.04%) and posttraining 262 (2.00%) ($P=.813$). After training was introduced, clinical management improved: McRoberts' position, pretraining 95/324 (29.3%) to 229/262 (87.4%) posttraining ($P<.001$); suprapubic pressure 90/324 (27.8%) to 119/262 (45.4%) ($P<.001$); internal rotational maneuver 22/324 (6.8%) to 29/262 (11.1%) ($P=.020$); delivery of posterior arm 24/324 (7.4%) to 52/262 (19.8%) ($P<.001$); no recognized maneuvers performed 174/324 (50.9%) to 21/262 (8.0%) ($P<.001$); documented excessive traction 54/324 (16.7%) to 24/262 (9.2%) ($P=.010$). There was a significant reduction in neonatal injury at birth after shoulder dystocia: 30/324 (9.3%) to 6/262 (2.3%) (relative risk 0.25 [confidence interval 0.11–0.57]).

CONCLUSION: The introduction of shoulder dystocia training for all maternity staff was associated with improved management and neonatal outcomes of births complicated by shoulder dystocia.

LEVEL OF EVIDENCE: II

Patient-actor perception of care: a comparison of obstetric emergency training using manikins and patient-actors

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Quality and Safety in Health Care 2008;17:20-24; doi:10.1136/qshc.2006.021873.

OBJECTIVE: To explore the effect of training on patient-actor perception of care during simulated obstetric emergencies.

METHODS: A subanalysis from a prospective randomised controlled trial in six UK hospitals and the Bristol Medical Simulation Centre, UK. Midwives and doctors working in participating hospitals were eligible for inclusion. 140 participants (22 junior and 23 senior doctors, 47 junior and 48 senior midwives) were randomised to one of four obstetric emergency training interventions: 1-day course at local hospitals; 1-day course at simulation centre; 2-day course with teamwork training at local hospitals; and 2-day course with teamwork training at simulation centre. Local training used patient-actors and low-fidelity part-task trainers whereas simulation centre training used full-bodied computerised manikins and high-fidelity part-task trainers. Three weeks before and after the training, the participants managed three simulated obstetric emergencies. Patient-actors scored their care after each simulation using a patient-actor perception score (communication, safety, respect).

RESULTS: The following numbers of scores were awarded: 139 and 132 participant and 46 and 48 team scenarios, before and after training, respectively. There was a significant improvement in all scores in all scenarios after the training ($p = 0.017$ to >0.001). Perception of safety and communication during postpartum haemorrhage was significantly improved following training with patient-actors compared with training with manikins (safety $p = 0.048$, communication $p = 0.035$). Teamwork training offered no additional benefit to patient-actors' perception of their care.

CONCLUSION: All multiprofessional training improved patient-actor perception of care. Training using a patient-actor may be better at improving perception of safety and communication than training with a computerised manikin simulator.