Background
According to current guidelines for resuscitation of newly born infants after birth, drugs are rarely indicated during the uncommon event of neonatal resuscitation; yet, if needed the recommended administration route is via a “centrally positioned umbilical venous catheter”.
Currently available neonatal manikins do not offer sufficiently realistic opportunities to train performance of umbilical venous catheterization.

Practice of umbilical venous catheterization using a resource-efficient ‘blended’ training model

Baik-Schneditz N1, Pocivalnik M1, Ulenberger B1, Mileder L1, Schwabinger B1
1Division of Neonatology, Department of Paediatrics and Adolescent Medicine, Medical University of Graz, Graz, Austria

We have developed a simple and resource-efficient, yet realistic training model using biological material. A single-use baby feeding bottle was filled with formaldehyde solution, the tip of the teat was cut and a piece of human umbilical cord of approximately 10cm length was inserted into the bottle through the teat. In a next step, a conventional baby doll was prepared by cutting two holes both in the abdominal wall and the back to introduce the baby bottle from dorsal. By using both biological material and a plastic manikin in our ‘blended’ training model, we were able to recreate real anatomic conditions to a large extent. As pieces of umbilical cord were provided by our hospital’s delivery room, costs of the presented training model are moderate. After having adapted the baby doll once, preparation time is only needed to adapt the formalin filled bottle and the umbilical cord.

We have used this training model for postgraduate courses on neonatal resuscitation aiming at emergency physicians. So far, trainees’ perceptions of the model were very positive. Trainees especially valued the opportunity to differentiate between arterial and venous umbilical vessels, which may provide a challenge for inexperienced personnel particularly under real-life, time-limited conditions. Being offered the opportunity to perform all steps necessary for successful umbilical venous catheter placement – including ligation and cutting of the umbilical cord, aspiration of fluid, injection of liquids and fixation of the catheter – was viewed favourably. As it should be the case whenever using biological material for training purposes, trainees are required to wear full personal protective equipment including glasses, face masks and gowns, rendering training conditions even more realistic.

CONCLUSION:
In essence, we have developed a training model for umbilical venous catheterization providing realistic anatomical conditions while being resource-efficient both from a financial and time-related perspective. According to our experience, this ‘blended’ training model can be implemented successfully in postgraduate education and training.

Kontakt: nariae.baik@medunigraz.at
Practice of umbilical venous catheterization using a resource-efficient ‘blended’ training model

Nariae Baik-Schneditz, Bernhard Schwaberger, Mirjam Pocivalnik, Berndt Urlesberger, Lukas P. Mieder

Division of Neonatology, Department of Paediatrics and Adolescent Medicine, Medical University of Graz, Graz, Austria

Nariae.baik@medunigraz.at Bernhard.schwaberger@medunigraz.at Mirjam.pocivalnik@medunigraz.at
Berndt.urlesberger@medunigraz.at Lukas.mieder@medunigraz.at

According to current guidelines for resuscitation of newly born infants after birth, drugs are rarely indicated during the uncommon event of neonatal resuscitation; yet, if needed the recommended administration route is via a “centrally positioned umbilical venous catheter”. As currently available neonatal manikins do not offer sufficiently realistic opportunities to train performance of umbilical venous catheterization, we have developed a simple and resource-efficient, yet realistic training model using biological material. A single-use baby feeding bottle was filled with formaldehyde solution, the tip of the teat was cut and a piece of human umbilical cord of approximately 10cm length was inserted into the bottle through the teat. In a next step, a conventional baby doll was prepared by cutting two holes both in the abdominal wall and the back to introduce the baby bottle from dorsal.

By using both biological material and a plastic manikin in our ‘blended’ training model, we were able to recreate real anatomic conditions to a large extent. As pieces of umbilical cord were provided by our hospital’s delivery room, costs of the presented training model are moderate. After having adapted the baby doll once, preparation time is only needed to adapt the formalin filled bottle and the umbilical cord.

We have used this training model for postgraduate courses on neonatal resuscitation aiming at emergency physicians. So far, trainees’ perceptions of the model were very positive. Trainees especially valued the opportunity to differentiate between arterial and venous umbilical vessels, which may provide a challenge for inexperienced personnel particularly under real-life, time-limited conditions. Being offered the opportunity to perform all steps necessary for successful umbilical venous catheter placement – including ligation and cutting of the umbilical cord, aspiration of fluid, injection of liquids and fixation of the catheter – was viewed favourably. As it should be the case whenever using biological material for training purposes, trainees are required to wear full personal protective equipment including glasses, face masks and gowns, rendering training conditions even more realistic.

In essence, we have developed a training model for umbilical venous catheterization providing realistic anatomical conditions while being resource-efficient both from a financial and time-related perspective. According to our experience, this ‘blended’ training model can be implemented successfully in postgraduate education and training.