A smartphone application with augmented reality for estimating weight in critically ill paediatric patients

Sig. TOMMASO SCQUIZZATO (1)(2), Prof. GIOVANNI LANDONI (1)(2), Dott. LUCA CARENZO (3), Dott. ALESSANDRO FORTI (4), Dott.ssa ARIANNA GAZZATO (5), Dott.ssa ALESSIA LA BRUNA (1), Dott. PIERFRANCESCO DE DOMENICO (1), Dott.ssa MARGHERITA TOZZI (1), Prof. ALBERTO ZANGRILLO (1)(2)

(1) Department of Anesthesia and Intensive Care, IRCCS San Raffaele Scientific Institute, Milan, Italia.
(2) Vita-Salute San Raffaele University, Milan, Italia.
(3) Department of Anesthesia and Intensive Care, Humanitas Clinical and Research Center, Rozzano Milan, Italia.
(4) Helicopter Emergency Medical Services of SUEM 118 ULSS 1, Pieve Di Cadore, Belluno, Italia.
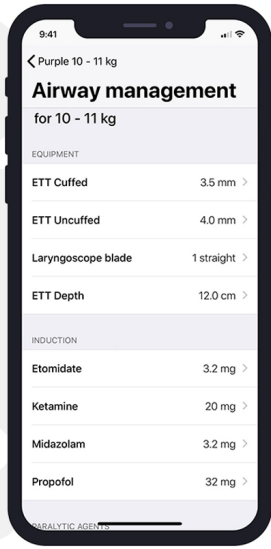(5) Azienda ULSS 3 Serenissima – Ospedale di Mirano, Mirano, Venezia, Italia.

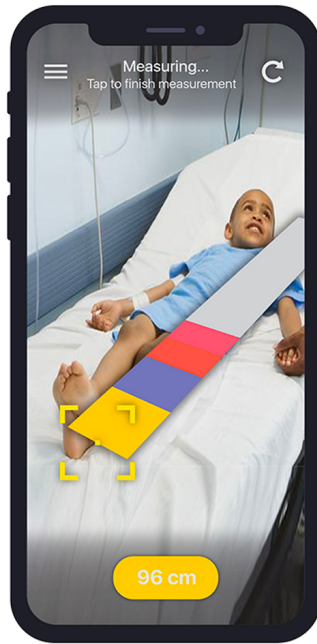Argomento: Trauma e arresto cardiaco

Introduction. Doses of resuscitation medications for treating critically ill children are usually calculated from weight. Therefore, knowing child weight becomes paramount in managing paediatric emergencies. In many occasions weight is unknown and impossible to obtain due to cardiopulmonary resuscitation, spinal immobilization, airway management and agitation. Resuscitation guidelines suggests that it is reasonable to use length-based tapes subdivided in colour zones for estimating child weight if it is unknown. We describe the first application that estimates child weight using the smartphone camera and augmented reality by implementing a virtual tape and suggesting pre-calculated doses.

How it works. After launching the app, the smartphone camera is activated, and augmented reality software tracks a correspondence between the real-world and the virtual space.After the completion of this process the app is ready to measure child height by pointing and tapping the marker displayed in the screen over the head of the child. A virtual tape anchored to the head is displayed and moving the smartphone around will increase its length like a self-retracting metal tape measure until the user points and taps the marker over the foot. In the bottom of the screen the measured length and the colour code is displayed along with the ability to consult medication dosages, equipment sizes and other critical calculations. In order to obtain accurate measures users must be aware of lighting conditions and quality of smartphone camera.
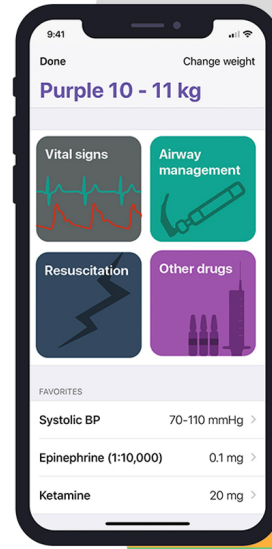
Conclusions and future perspectives. This app estimates the child's weight through the smartphone camera with augmented reality and provides medications doses to emergency physicians, nurses and paramedics. This app may improve weight estimation by implementing a machine learning model that features gender and body habitus. This app was not formally validated and there is the need to perform a clinical study before using it in the clinical setting.

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