

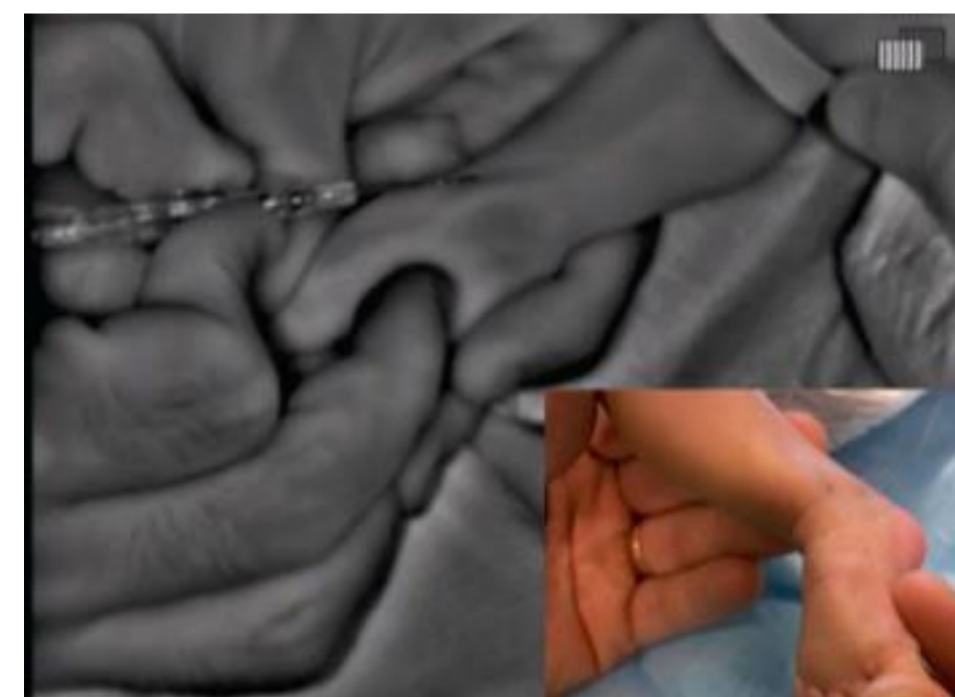
Interest of a near infrared device (Veinsite® Vuetek®scientific) to support intravenous cannulation in children

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Introduction: The goal of this study is to evaluate the contribution of a near infrared device to cannulate peripheral veins in pediatric operating room (OR) and intensive care ward (PICU). The Veinsite® (VS) is a head-mounted device including a portable near infrared emitter, allowing direct vision on the skin (moving eyes downwards) and the enhanced near infrared vision of the vein in the screen of the helmet (head-up display).

Materials and methods: Prospective study (January-February 2015) (approval by our Institutional Ethics Committee). Eight senior pediatric anesthesiologists and intensivists trained in VS practice (6 successful cannulations i.e. learning curve) used it 1/ in OR: for all children undergoing surgery and requiring an I.V. line. A first attempt was performed classically by the operator ; in case of failure, the VS was taken. 2/ for all children in our institution (oncology, surgery, emergency, □) requiring an IV route, and in case of failure, the team of Intensive care unit was requested ; after an attempt by the ICU nurse, and in case of failure, the senior used VS. VS could be used as the first choice. For each child, we noted : demographic data (sex, age, weight, height, BMI, Fitzpatrick phototypes, clinical status) - use of EMLA patch, N₂O, sevoflurane - visibility of the veins (good-poor-none), palpation after placement of tourniquet (good-poor-none) - haematoma, puncture marks. Statistics by SPSS.

Results



	N	age	weight	height	BMI	Sex	Fitzpatrick VI	Sedation (S, EMLA, N ₂ O)
OR	359	5.5 years (1dy-18 yrs)	18 kg (2.7-123kg)	112 cm (48-194 cm)	16 (10-43)	M : 64%	2%	S 90%, EMLA 6%
PICU	57	7 months (1 mth-18 yrs)	7.7 kg (3-89 kg)	69 cm (50-180 cm)	17 (12-33)	M : 68.4%	10.5%	N ₂ O 14%, EMLA 12.3%



OR : none acute disease - PICU: infection, dehydration, multiples previous puncture attempts

	Visibility		Palpation with tourniquet	
	good	none	good	none
OR	71%	8.3%	56.8%	20.3%
PICU	10.5%	37%	8.8%	65%



	Use of VS	VS choose first	Success rate	Trials		
				1	2	maxi
OR	14%	2%	100%	78%	12%	5 (2 children)
PICU	94.7%	35%	89.5%	53%	15.7%	5 (1child)

Discussion: If in the OR. in the best conditions (stable status, general anesthesia, no puncture before), the help of the VS was moderate but useful, in PICU, in difficult conditions (dehydration, multi puncture attempts, no general anesthesia) its contribution was crucial and decisive. The near infrared vision reveals a peripheral venous mapping, avoiding the puncture of inhospitable veins (too thin, too short, irregular) and finding others, not clinically visible, decreasing pain and the cost of this procedure. This device is even more useful for less trained operators.