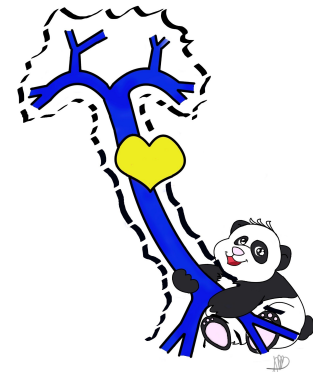


UN ALGORITMO PER LA SCELTA DELL'ACCESSO VENOSO NEL NEONATO



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X Congresso GAVeCeLT
XI PICC Day
4-6 Dicembre Firenze



GAVePed
Gruppo Accessi Venosi Pediatrici



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I have no actual or potential conflict of interest in relation to this presentation

QUALE ACCESSO VENOSO CENTRALE NEL NEONATO ?

☐ CVO

solo alla nascita, e per pochi giorni

La vera scelta cruciale è tra :

☐ AVP – Accesso venoso periferico

☐ ECC – epicutaneo cavale in vene superficiali

☐ CICC o FICC – catetere venoso in vene profonde



AGENDA

Indicazioni ai CVO

Durata AVP

Durata ECC?

Indicazioni ai CICC

Algoritmo



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Algoritmo

EG (sett)	Vena Omb.	Arteria Omb.	Vena Perif.
<26	SI	SI, se A o B	NO
27 - 28	SI	SI, se B	NO
29 - 31 + A o B o C o D o E o G	SI	NO	NO
29 - 31	NO	NO	SI
32 - 33 + A o B o C o D o E	SI	NO	NO
32 - 33 + F	NO	NO	SI
32 - 33	NO	NO	NO
≥ 34 + A o B o C o D o E	SI	NO	NO
≥ 34 + F	NO	NO	SI
≥ 34	NO	NO	NO

INDICAZIONI AL CVO

- A. Ventilazione assistita con tubo OT
- B. Instabilità emodinamica
- C. CPAP con Fio₂ >30%
- D. Difficoltà reperire accesso periferico
- E. SGA + centralizzazione del circolo/AED/ARED
- F. PN < 1500 g
- G. PN ≤ 1000 g



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DURATA AVP

Percutaneous central venous catheters versus peripheral cannulae for delivery of parenteral nutrition in neonates (Review)

Ainsworth S, McGuire W

Summary of Findings

Neonates with PICCs received higher proportions of prescribed volumes of parenteral nutrition compared with short peripheral cannulas (96.8% vs 89.7%, respectively; mean difference, 7.1% [95% CI, 3.2% to 11.0%]). No trials reported growth parameters. There were no associations of catheter type with in-hospital mortality (10/196 [5.1%] vs 8/203 [3.9%]; risk ratio [RR], 1.31 [95% CI, 0.36 to 4.81]), or extravasation injury (1/102 [1.0%] vs 5/106 [4.7%]; RR, 0.36 [95% CI, 0.07 to 1.75]) or invasive infection (67/271 [24.7%] vs 72/278 [25.9%]; RR, 0.95 [95% CI, 0.72 to 1.25]) (Figure). PICC use was associated with fewer subsequent catheters or cannulas inserted during the trial period (mean difference, -3.1 [95% CI, -4.1 to -2.06]).

Comparison of Findings With Current Guidelines

In 2011, the US Centers for Disease Control and Prevention Healthcare Infection Control Practices Advisory Committee guidelines² recommended PICC instead of a short peripheral cannula “when the duration of intravenous therapy will likely exceed six days.” The findings of this meta-analysis support this.



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DURATA ECC

ECC duration: tempo tra inserzione e rimozione o CLABSI
EG 31 W PN 1600 gr
ECC duration mediana 12 giorni (IQR: 6 –21)

TABLE 4 Risk Factors for CLA-BSIs in NICU Patients With PICCs

Risk Factor	Univariate			Multivariable		
	IRR ^a	95% CI	P	IRR	95% CI	P
Gestational age, wk						
<32	1.00			1.00		
≥32	0.40	0.14–1.19	.10	0.50	0.08–3.18	.46
Birth weight, g						
<1500	1.00			1.00		
≥1500	0.45	0.16–1.22	.12	0.94	0.17–5.18	.94
Chronological age, d						
≤7	1.00			1.00		
>7	1.44	0.59–3.46	.42	1.34	0.56–3.25	.51
Days since PICC insertion						
<19	1.15 ^b	1.05–1.26	<.01	1.14 ^b	1.04–1.25	<.01
19–35	0.80 ^b	0.67–0.96	.02	0.80 ^b	0.66–0.96	.02
>35	1.32 ^b	1.12–1.55	<.01	1.33 ^b	1.12–1.57	<.01

Tempo mediano
di infezione 18
giorni (IQR 9-21)

DURATA ECC

DWELL Time: tempo tra inserzione e rimozione o CLABSI
CLABSI: Emocoltura positive senza evidenza di infezione in altro sito

TABLE 2 Effect of Dwell Time on CLABSI

Week of Dwell Time	PICCs, <i>N</i>	CLABSI, <i>N</i> (%)	PICCs, HR ^a (95% CI)	<i>Ca</i>
1	14 451	82 (0.6)	Reference	
2	8250	56 (0.7)	1.2 (0.9–1.7)	
3	4061	31 (0.8)	1.3 (0.8–1.9)	
4	2209	5 (0.2)	0.4 (0.1–0.9)	
5	1290	7 (0.5)	0.9 (0.4–1.9)	
6	765	7 (0.9)	1.5 (0.7–3.2)	
7	453	4 (0.9)	1.4 (0.5–4.0)	
8	278	3 (1.1)	1.6 (0.5–5.2)	
9	183	2 (1.1)	1.5 (0.4–6.3)	
10	125	0		

CI, confidence interval; HR, hazard ratio.

^a HRs are adjusted for PMA, year of catheter insertion, and site.



TABLE 3 Effect of PMA on CLABSI

PMA, wk	PICCs, <i>N</i>	PICCs, HR ^a (95% CI)	Tunneled Catheters, <i>N</i>	Tunneled Catheters, HR ^a (95% CI)
≥37	1835	Reference	314	Reference
34–36	1340	1.0 (0.3–3.8)	193	0.6 (0.1–2.8)
30–33	3315	1.3 (0.4–3.6)	130	0.3 (0.04–3.0)
26–29	5251	3.9 (1.6–9.7)	203	1.5 (0.5–5.0)
<26	2707	6.1 (2.5–15.2)	274	1.3 (0.4–3.8)

Sample sizes indicate number of patients with each type of catheter at each PMA. CI, confidence interval; HR, hazard ratio.

^a HRs are adjusted for line week, year of catheter insertion, and site.

TABLE 1 Catheter Dwell Time

Dwell Time, d	PICCs, Median (IQR)
Overall	11 (7–18)

Effect of Catheter Dwell Time on Risk of Central Line–Associated Bloodstream Infection in Infants. Greenberg. Pediatrics 2015

DURATA ECC

Australia

EG 27 W PN 900 gr

ECC rimossi elettivamente ad un tempo mediano di 193 h (142–287) 8 giorni

ECC rimossi non elettivamente ad un tempo mediano 154 h (102–260) 6.5 giorni

Table 3 The odds ratios for non-elective PICC removal per tip position, correcting for birth weight, gestational age and sex, using the tip in the SVC as reference position

Tip position	Odds for non-elective removal	<i>p</i> value
SVC	1	Reference
Brachiocephalic vein	0.88	0.67
Subclavian vein	1.46	0.069
Axillary vein	2.08	0.041
Cephalic vein	8.93	<0.001
IVC	1.24	0.38
Common iliac vein	1.59	0.24
External iliac vein	4.99	<0.001
Femoral vein	10.31	<0.001

TABLE 1 Demographic Characteristics of the 3 Study Groups

Characteristics	PICC Group (<i>n</i> = 180)	UVC Group (<i>n</i> = 180)	UVC + PICC Group (<i>n</i> = 180)	<i>P</i>		
				PICC Versus UVC	PICC Versus UVC + PICC	UVC Versus UVC + PICC
Gestational age, mean (SD), wk	27.2 (1.5)	27.2 (1.5)	27.2 (1.5)	.99	.99	.99
Birth weight, mean (SD), g	1019 (244)	1023 (250)	1023 (243)	.88	.88	.99
Boy, <i>n</i> (%)	106 (59)	106 (59)	106 (59)	.99	.99	.99
Small for gestational age, <i>n</i> (%)	22 (12)	18 (10)	16 (9)	.50	.30	.72
Apgar at 5 min < 7, <i>n</i> (%)	54 (31)	67 (39)	53 (30)	.18	.82	.12
SNAP-II score >20, <i>n</i> (%)	26 (20)	55 (40)	49 (32)	<.01	.03	.17
Mechanical ventilation on day 1, <i>n</i> (%)	89 (49)	116 (64)	126 (70)	<.01	<.01	.26
Duration of mechanical ventilation, median (IQR), d	2 (0–10)	2 (0–6)	5 (1–13.5)	.34	.02	<.01
Duration of CPAP, median (IQR), d	7 (1–18)	10 (1–29)	18 (5–29)	.05	<.01	<.01
Duration of UVC, median (IQR), d	NA	8 (6–10)	7 (5–9)	NA	NA	<.01
Duration of PICC, median (IQR), d	13 (9–19)	NA	13 (8–22)	NA	0.49	NA

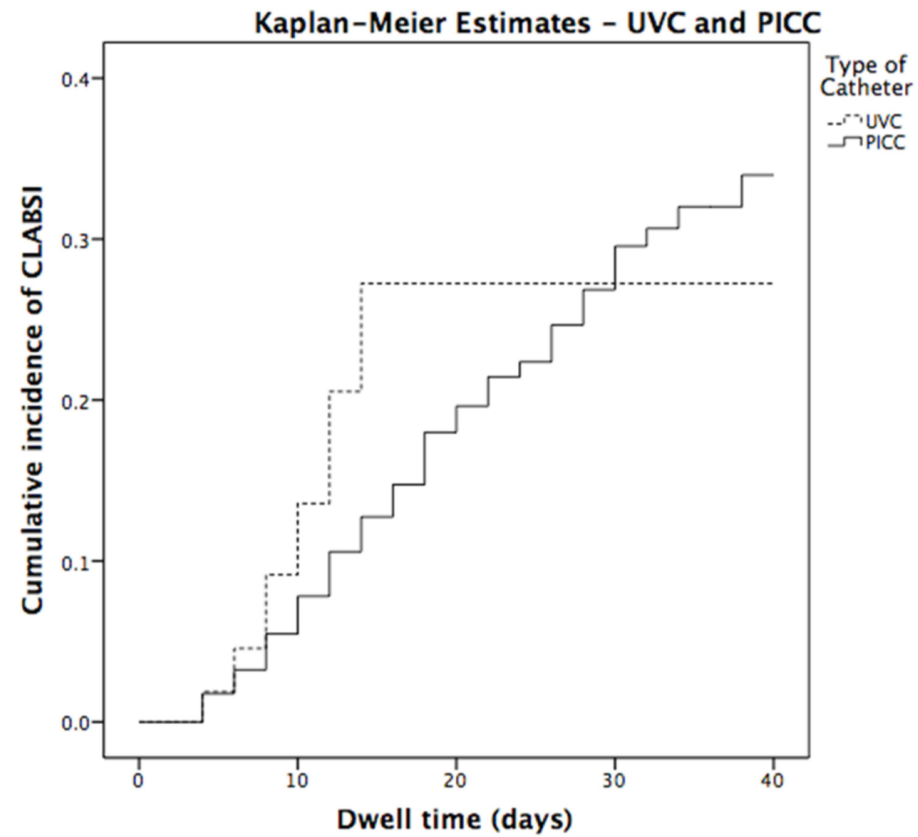
CPAP, continuous positive airway pressure; IQR, interquartile range; NA, not applicable.

Table 3
Reasons for the removal of PICCs prior to completion of treatment

Complications	Lower extremities <i>n</i> (%)	Upper extremities/Scalp <i>n</i> (%)	Total <i>n</i> (%)	<i>p</i> -value*	<i>p</i> -value*
Mechanical	11 (26)	52 (42)	63 (38)	0.061	
Swelling/leakage	16 (38)	39 (32)	55 (33)	0.429	0.450
Sepsis/presumed sepsis	8 (19)	14 (11)	22 (13)	0.692	0.612
Thrombophlebitis	5 (12)	18 (15)	23 (14)	0.200	0.453
Other reasons #	2 (5)	1 (1)	3 (2)	0.096	0.350
TOTAL	42	124	166		0.001

**P*-values for the differences between lower and upper extremities, derived from the chi-square or Fisher's exact test. # of other reasons indicated: renal vein thrombosis (*n* = 1). need for only one PICC (*n* = 2).

DURATA ECC



Dwell Time and Risk of Central Line-Associated Bloodstream Infection in Neonates. Sanderson. Journal of Hospital infection 2017



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INDICAZIONI AL CICC NEL NEONATO

Nel neonato acuto/grave:

Necessità di accesso centrale per rapida replezione volemica (in emergenza e/o in vista di interventi di chirurgia maggiore).

Neonati con instabilità emodinamica e necessità di monitoraggio della PVC a qualunque età di vita (nell'impossibilità a posizionare un CVO o in caso di CVO malposizionato).

Neonato in trattamento ipotermico e con necessità di inotropi in caso di CVO malposizionato ed impossibilità a riposizionarlo.

Neonato con patologia malformativa maggiore prima dell'intervento chirurgico (es atresia esofagea, onfalocoele, gastroschisi etc).

INDICAZIONI AL CICC NEL NEONATO

Nei neonati pretermine stabile:

Neonati pretermine con previsione di NP e terapia endovenosa prolungata (> 14 giorni).

Neonato pretermine con patologia gastrointestinale chirurgica (NEC o perforazione intestinale).

INDICAZIONI AL CICC NEL NEONATO

Altre situazioni particolari:

Necessità di un accesso centrale a due lumi (es infusione di Milrinone).

Neonati con BPD severa di tipo 2 (necessità di VM a 36 settimane di EPM) e necessità di terapia endovenosa.

Esaurimento del patrimonio venoso superficiale (es nel caso di necessità di ricorrere alle vene dello scalpo per esaurimento delle vene ai 4 arti).

Neonati nei quali - pur essendovi vene periferiche superficiali disponibili - la inserzione di un catetere epicutaneo cavale incontra difficoltà ripetute di posizionamento della punta.



AGENDA

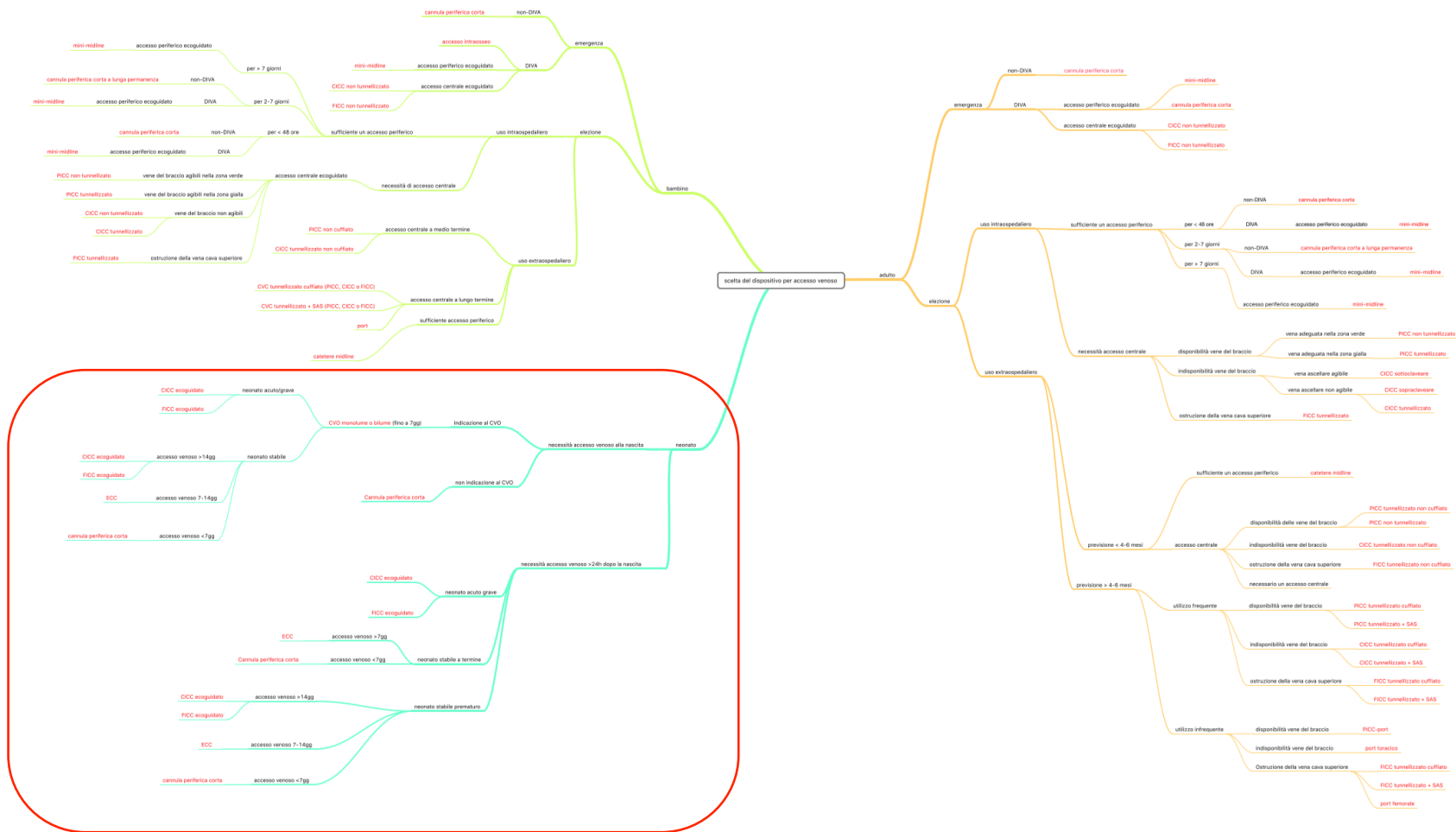
Indicazioni ai CVO

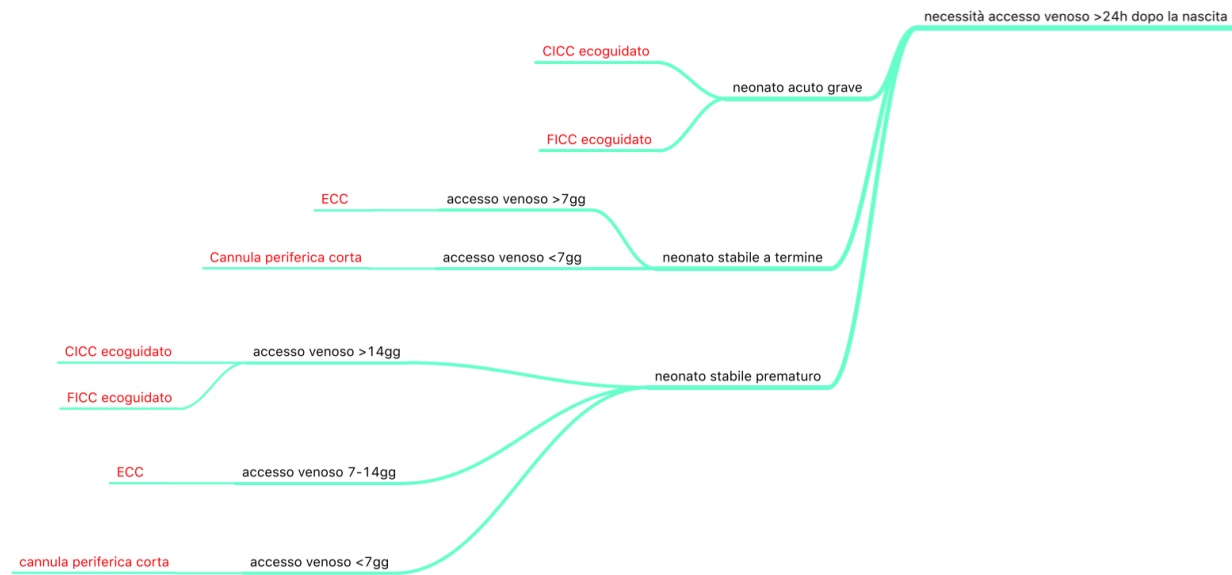
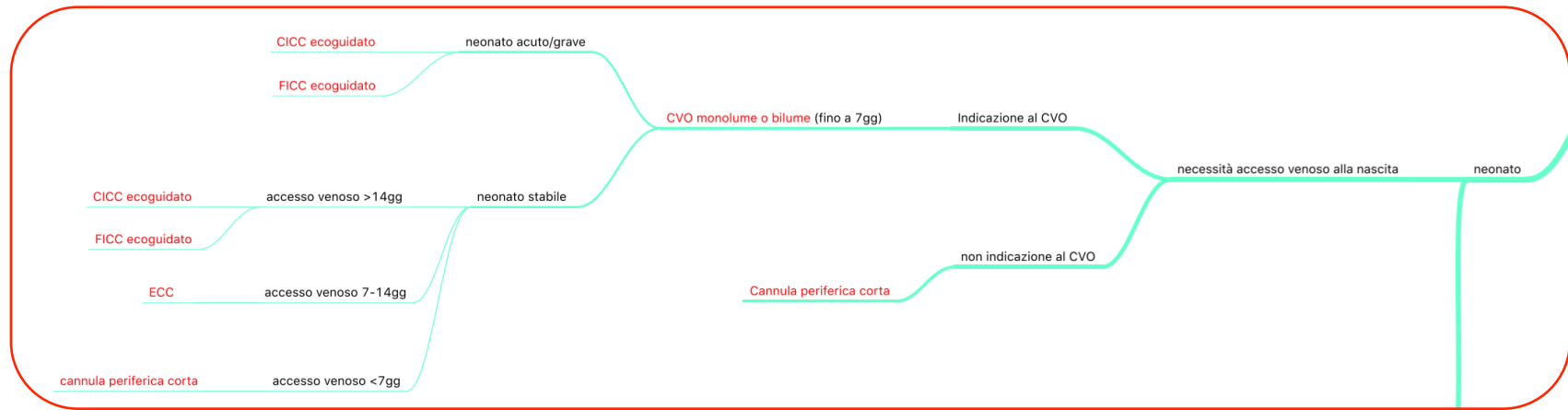
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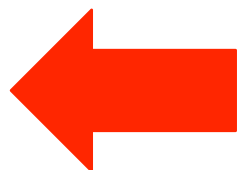
Durata ECC?

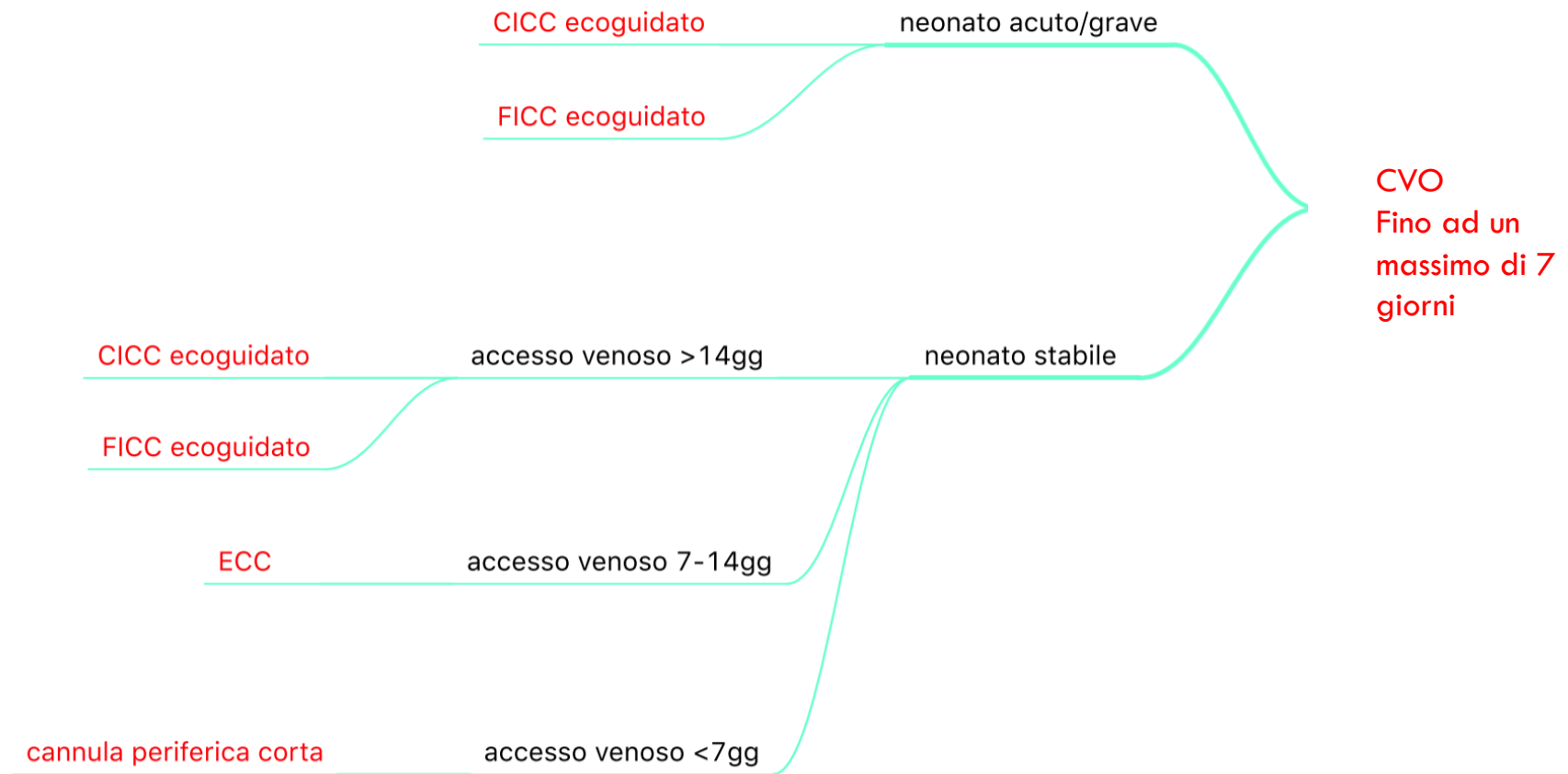
Indicazioni ai CICC

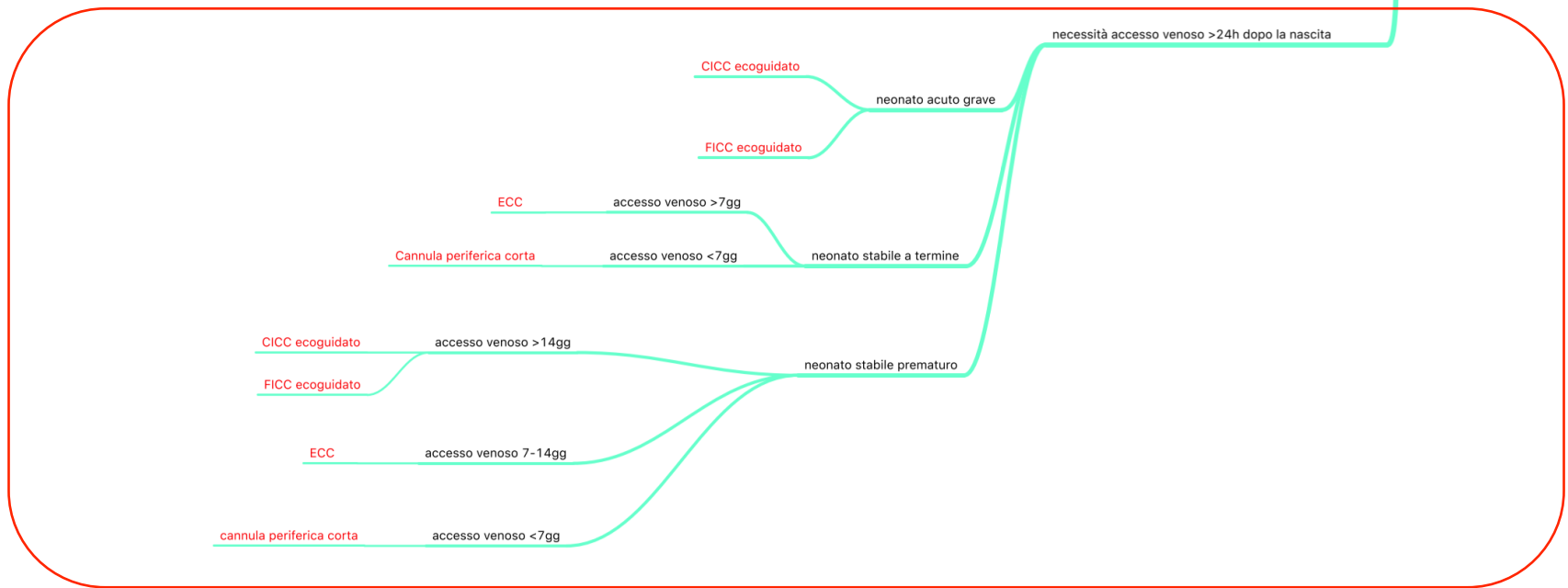
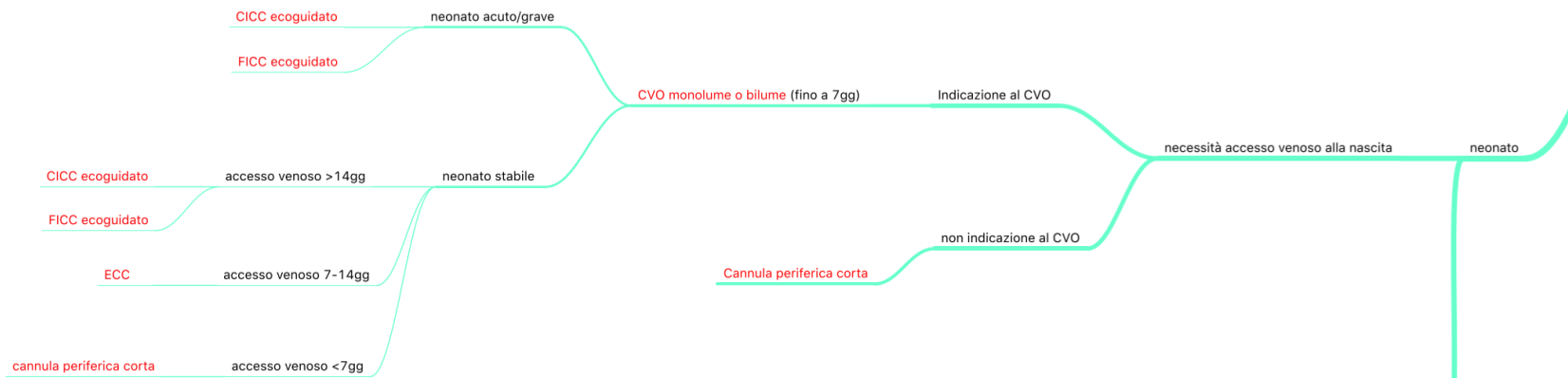
Algoritmo



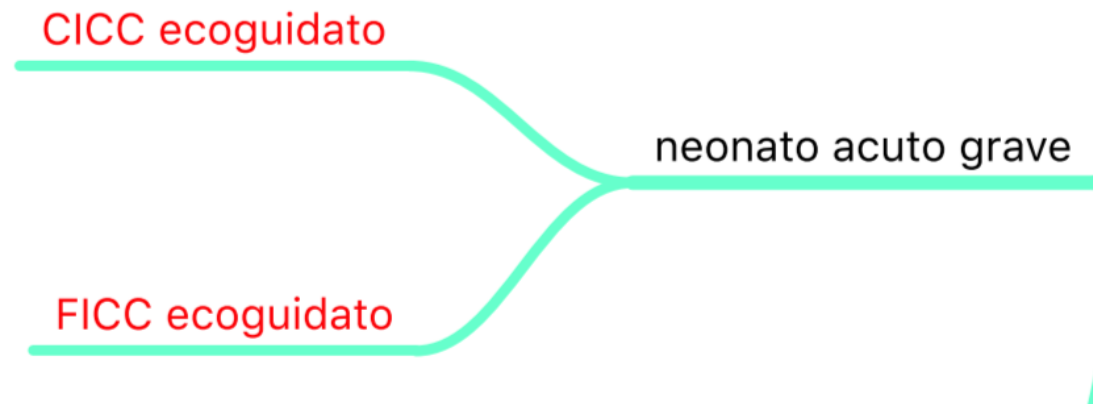








Necessità di accesso venoso > 24 h dalla nascita



Necessità di accesso venoso > 24 h dalla nascita

