

Resuscitation Research

Intraosseous Delivery of Fluids & Drugs During Cardiac Arrest

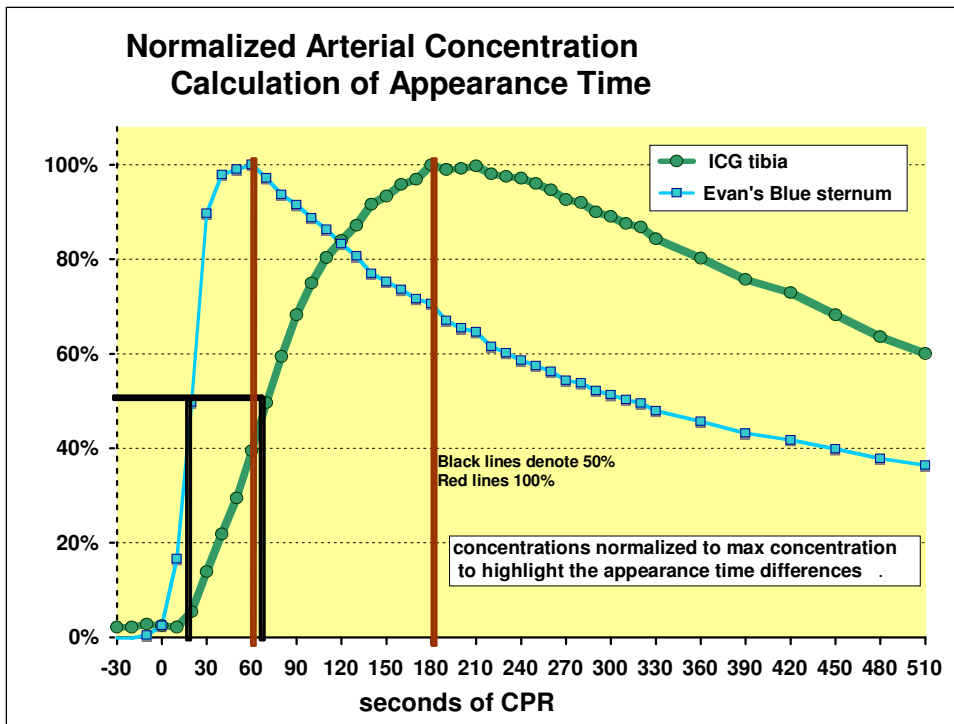
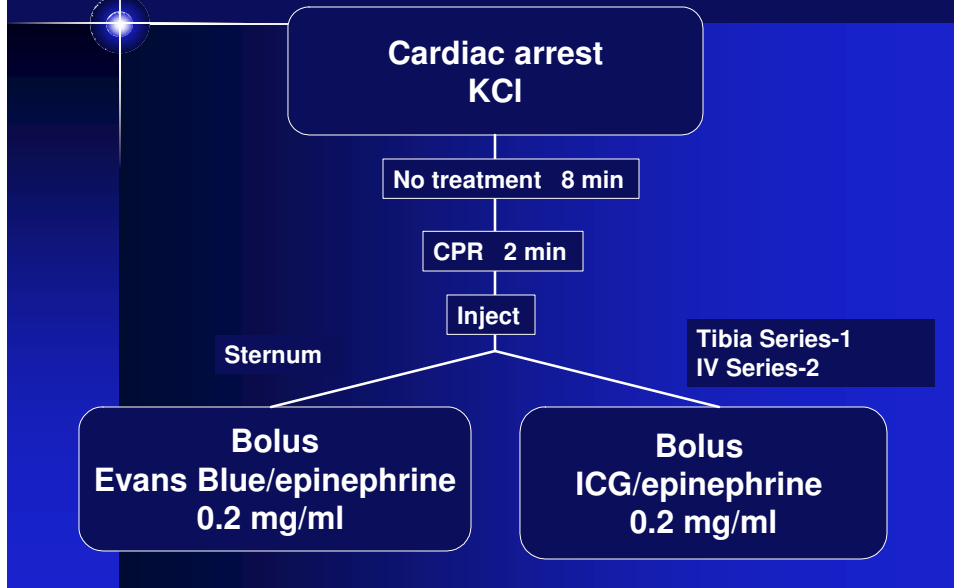
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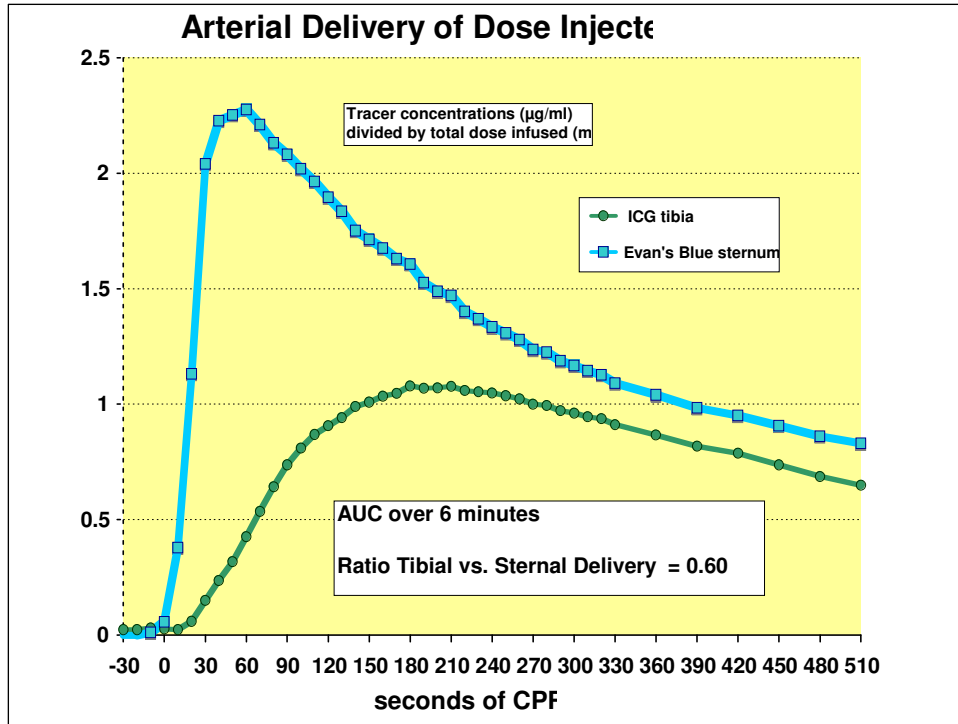
How effective is IO bolus drug delivery during CPR?

Controlled animal trial of drug delivery during CPR:

Tibial IO
Sternal IO
Central IV

Protocol





Appearance Time of Tracers in seconds Sternum vs. Tibia

	Max Conc.		50% Conc.	
	Sternum	Tibia	Sternum	Tibia
	100	150	30	70
	80	300	25	80
	60	180	20	70
	30	100	10	45
	20	40	20	40
	30	100	20	50
	20	50	15	25
	50	60	25	35
Mean (SD)	49 (30)	123 (87)	21 (6)	52 (19)
Range	20-100	40-300	10-30	25-80

Appearance Time of Tracers in seconds Sternum vs. Central Vein

	Max Conc.		50%Max	
	Sternum	IV	Sternum	IV
	80	100	36	57
	50	50	24	24
	70	50	34	23
	50	50	29	28
	110	110	52	48
	70	70	28	27
	130	110	29	24
Mean (SD)	80 (33)	78 (30)	33 (10)	29 (10)
Range	50-130	50-110	24-52	23-48

Summary Appearance Times

seconds to max concentration
and to % 50% max

	Sternum n=15		Tibia n=8		IV n=7	
	Max	50%	Max	50%	Max	50%
Mean	62	25	122	51	77	33
SD	33	10	86	19	29	9

Results

- **Tibial drug delivery was 2-3 times longer/ slower than Sternal delivery (20 vs. 50 seconds)**
- **The total dose delivered to arterial blood averaged over 6 min for tibia was 75% of sternal delivery for both the T and S site.**
- **Sternal IO appearance time delivered is similar to jugular vein.**

Conclusion

- **Both the IO tibial and IO sternal routes are effective for drug delivery during CPR**
- **The sternal route has some advantage of both time and efficiency**
- **The sternum IO drug delivery may be fully equivalent to IV delivery**