

Neonatal Vascular Access: UVC & IO

Indications, Timing, and Team
Coordination in Advanced Resuscitation

Source: Textbook of Neonatal Resuscitation, 9th Edition



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The Resuscitation Timeline: When to Pivot?

Initial
Steps

Ventilation

Intubation

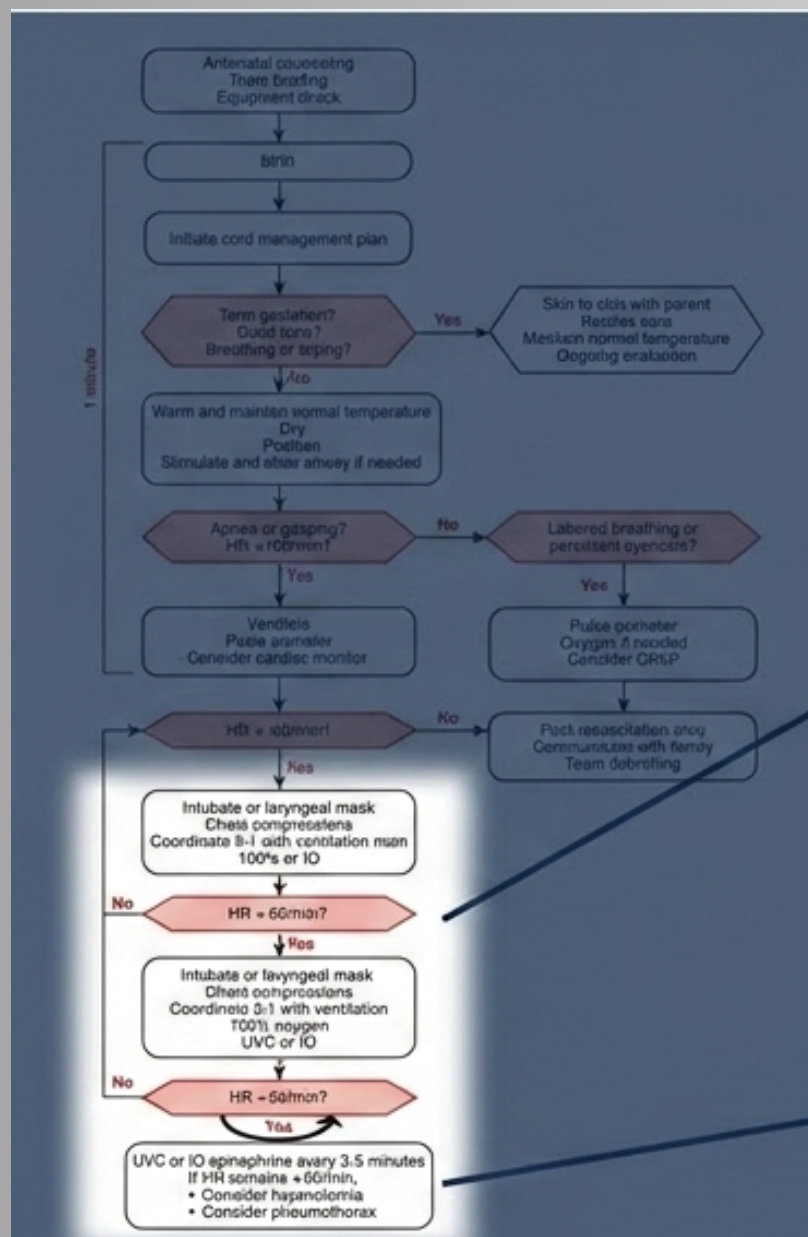
Chest
Compressions

Vascular
Access

The Trigger

Emergency vascular access is strictly indicated in the advanced stages of resuscitation when the newborn fails to respond to foundational interventions.

The Algorithm: Establishing Access



Concurrent Action: Prepare for UVC or IO access immediately alongside initiating chest compressions and 100% oxygen.

Primary Utilization: Administration of epinephrine every 3-5 minutes.

The 3-Part Clinical Indication

Effective Ventilation:

An alternative airway (endotracheal tube or laryngeal mask) has been successfully secured.

High-Quality Compressions:

Coordinated chest compressions using 100% oxygen have been ongoing for 60 seconds.

Persistent Bradycardia:

The infant's heart rate remains consistently < 60 bpm.

Indication Met:

Epinephrine administration is now required; emergency vascular access (UVC or IO) must be established.

Modalities of Emergency Access



Type: Umbilical Vein Catheter (UVC)

Role: The primary, preferred route for emergency vascular access in the delivery room.

Location: Inserted directly into the umbilical vein at the umbilicus.

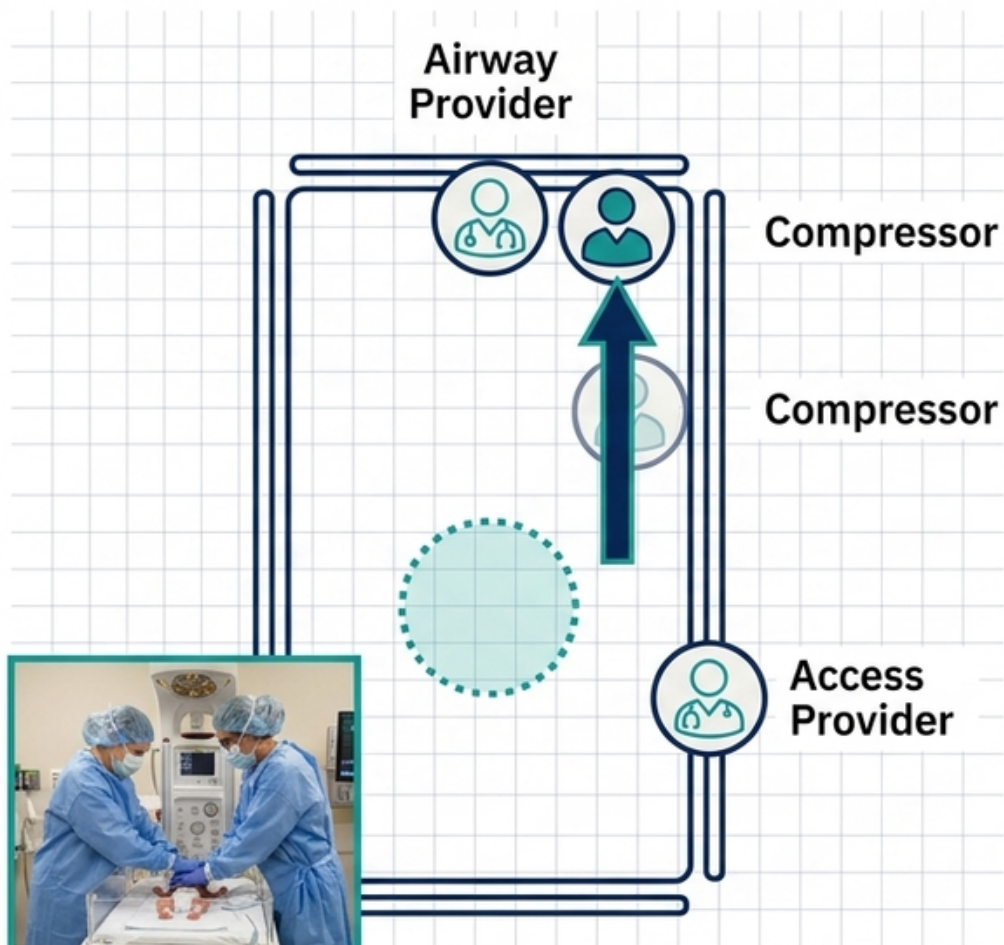


Type: Intraosseous (IO) Needle

Role: The approved alternative route.

Utility: Deployed when a UVC is not feasible, unsuccessful, or if resuscitation is occurring outside a standard delivery room setting.

Team Choreography: Creating Physical Space



Move to the Head of the Bed

Action Step:

Once the airway is secure, the provider performing compressions must move to the head of the bed.

Strategic Advantages:

- 1. **Space:** Clears the side of the bed, providing vital physical space required for safe UVC insertion.
- 2. **Stamina:** Offers mechanical advantages that result in less compressor fatigue.

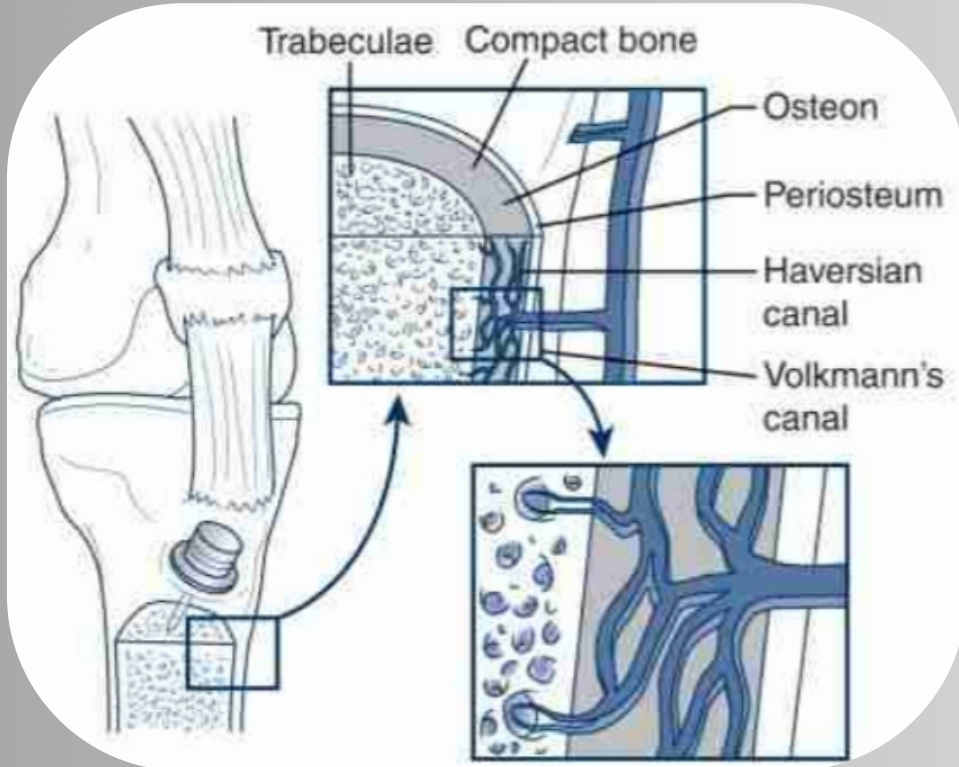
Resource Allocation: Calling for Help

Preparing for vascular access and epinephrine administration cannot interrupt ongoing resuscitation efforts.

	Continuous Ventilation
	Uninterrupted Coordinated Compressions
	Concurrent Preparation: Mobilize personnel to prepare UVC/IO equipment and draw up epinephrine.

Takeaway: Call for additional help the moment chest compressions are initiated.

Intraosseous



Intraosseous needle in the bone marrow cavity. Infused medications and fluids reach the central venous circulation



Identify the insertion site. For term infants, the preferred site is the flat surface of the lower leg, approximately 2 cm below and 1 to 2 cm medial to the tibial tuberosity.

Needle insertion site along the flat ANTEROMEDIAL surface of the TIBIA



Quickly clean the insertion site



Hold the intraosseous needle perpendicular to the skin and advance the needle through the skin to the surface of the bone (periosteum)

If advancing the needle by hand, use strong downward pressure with a twisting motion

If advancing the needle with an electric drill, press the trigger while maintaining downward pressure. When the needle enters the marrow space, a distinct change in resistance (“pop”) is noticeable.

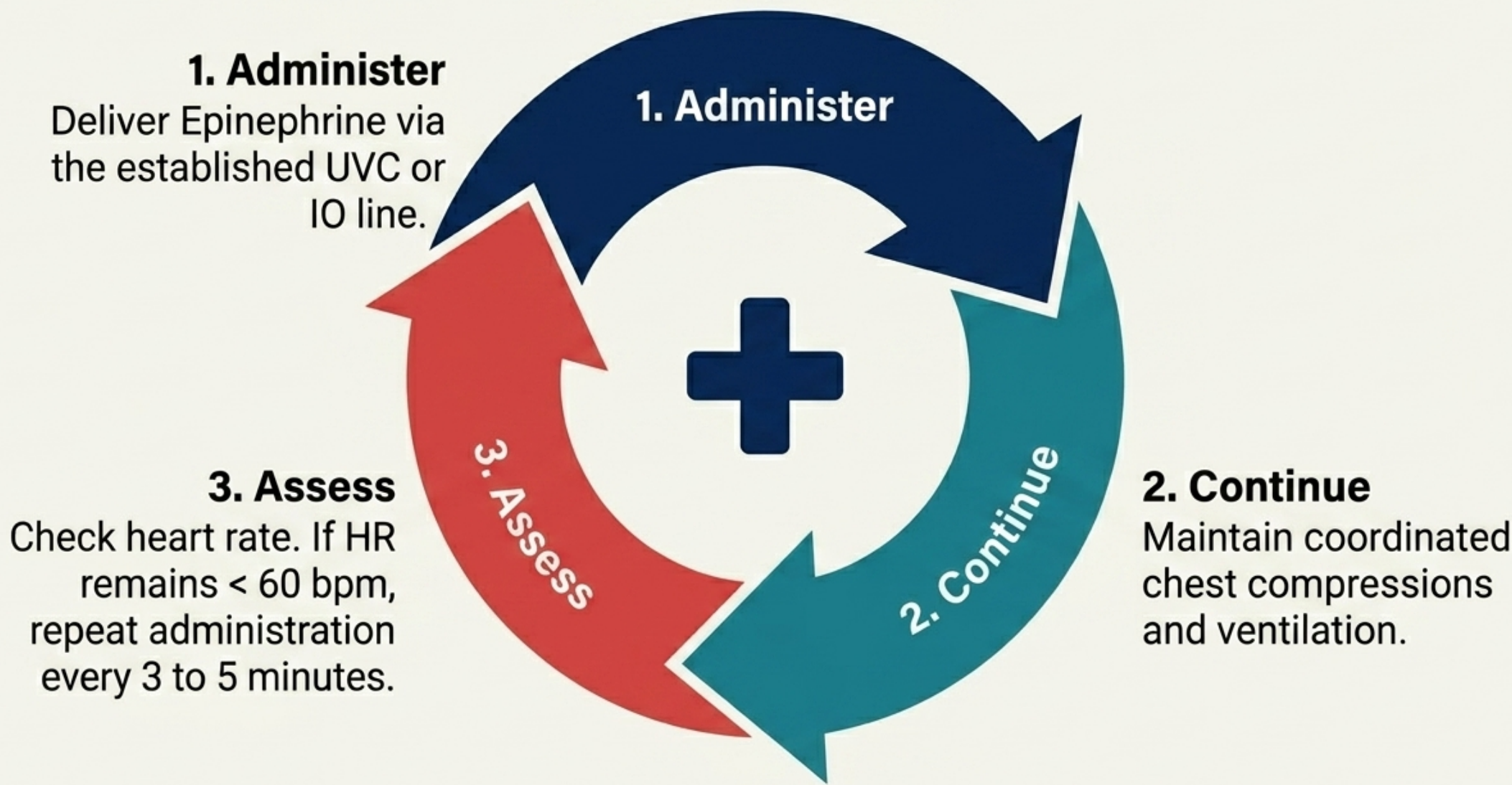


Remove the intraosseous needle stylet



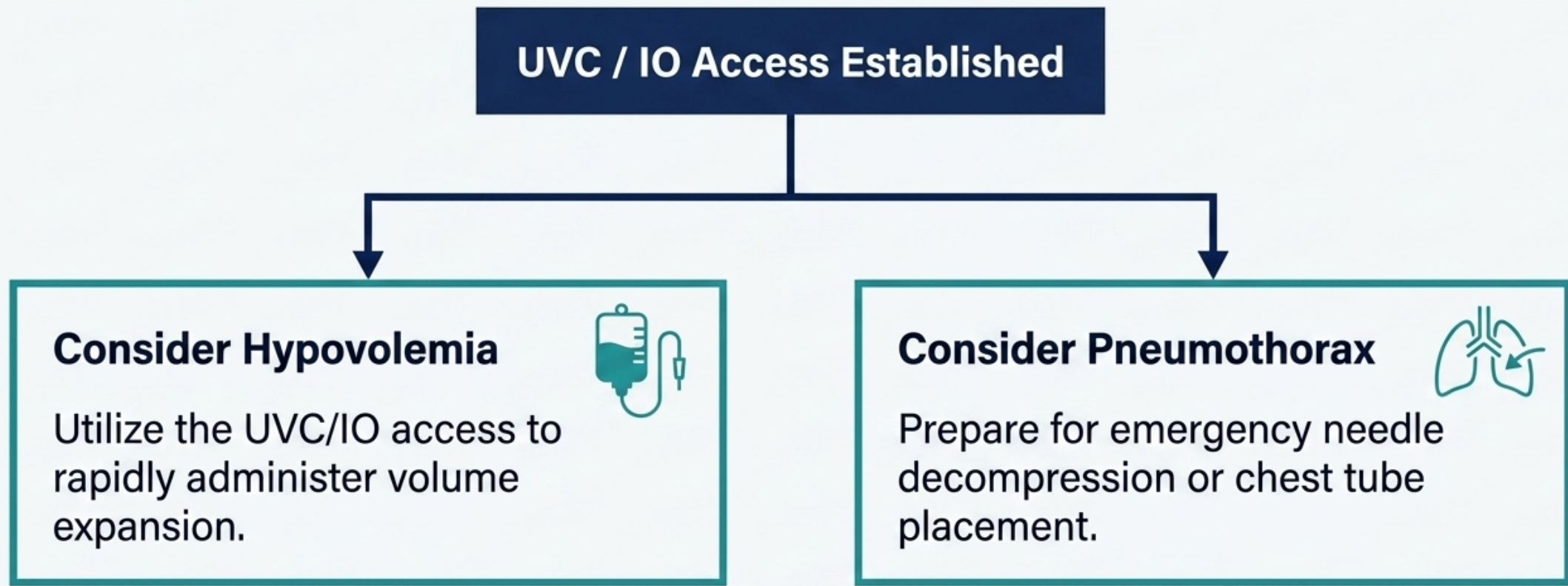
Connect an infusion set to the needle's hub, open the stopcock toward the needle, flush with 3 to 5 mL of NS to open the bone marrow space, and administer the medication and saline flush.

Utilizing Access: The Epinephrine Cycle



Beyond Epinephrine: Reversible Causes

If the heart rate remains < 60 bpm despite effective ventilation, compressions, and epinephrine, vascular access allows for immediate advanced interventions.



Key Takeaways: UVC & IO in NRP

The Indication



Triggered strictly when Heart Rate < 60 bpm persists despite an effective airway, 100% oxygen, and 60 seconds of coordinated chest compressions.

The Application



UVC (primary) or IO (alternative) provides the critical route for epinephrine (every 3-5 mins) and emergency volume expansion.

The Choreography



Requires immediate additional personnel. The compressor must move to the head of the bed to create the physical space necessary for safe UVC insertion.

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