

Phlebotomy Top Gun

Drawing Blood From a Patient Receiving Intravenous Fluids

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HOT TOPIC / Phlebotomy Top Gun, Intravenous Fluids



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Disclosures

- None

In a patient with an IV, you may draw from the same arm as IV if...

1. You draw above the IV
2. You draw below IV with tourniquet between IV and draw site
3. You can only draw from other arm
4. Data suggest that 2 and 3 are equally effective

Drawing from Patient with IV Running

- CLSI guidelines
 - CLSI guideline GP41-ED7
 - Collection of Diagnostic Venous Blood Specimens
 - “Collecting blood from an arm that is being infused with IV fluids carries a potential risk for erroneous and misleading results”
 - Recommends using opposite arm whenever possible
 - When not possible, collect distal to (below) IV site

Drawing from Patient with IV Running

- CLSI GP41-ED7 guidelines
 - For distal collection
 - Turn off IV for at least 2 minutes
 - Apply tourniquet between IV and draw site
 - Perform venipuncture
 - Drawing proximal (above) IV is not recommended, only when all other options have been exhausted

Drawing from Patient with IV Running¹

- Watson et al, 1983 (Am J Clin Pathol)
 - Eighteen volunteers had chemistry/CBC at baseline, and above and below an active IV
 - Calcium, uric acid, cholesterol, albumin, protein, bilirubin, lactate dehydrogenase, sodium, potassium, chloride, hemoglobin all different from baseline when drawn above IV
 - Below IV only glucose and phosphorus were significantly different from baseline
 - Glucose and phosphorus also significantly different from baseline when drawn opposite arm
 - No difference below IV vs opposite arm

Drawing from Patient with IV Running²

- Ong et al, 1979 (Am J Clin Pathol)
 - Fifteen patients had samples drawn below IV and from other arm
 - Eighteen chemical parameters and CBC analyzed
 - Used tourniquet between IV and draw site
 - IV was not stopped for sampling
 - Only glucose showed any difference when drawn from IV arm
 - Glucose 43 mg/dL higher in IV arm

Drawing from Patient with IV Running³

- Read et al, 1988 (Am J Clin Pathol)
 - 24 volunteers infused with 5% dextrose and normal saline 20 minutes
 - At 1, 2, and 3 minutes after IV shut off collected blood above (proximal to) IV, and from other arm
 - Compared Na, Cl, RBC count, and glucose between arms and to baseline values
 - RBC count, Na, Cl normalized by 1 minute
 - Glucose (given in IV) still 5-10 mg/dL higher in IV arm at 2-3 minutes
 - Dilution effect from IV not large, if not measuring substance being given

Drawing from Patient with IV Running

- Mayo data on contaminated line/IV draws
 - Glucose, calcium, magnesium, phosphorus most common cause of sample contamination
 - Glucose problematic if glucose being infused, shut off IV 2 to 3 minutes and draw below IV or other arm
 - Not shutting off admin glucose will result in contaminated specimen (for glucose), regardless of whether other or same arm used
 - Contamination from same arm likely worse than contamination from other arm

Drawing from Patient with IV Running

- Mayo data on contaminated line/IV draws
 - Patients receiving calcium, phosphorus, magnesium replacement problematic
 - IV replacement of magnesium and phosphorus becoming more common
 - Equilibrium can take hours not minutes
 - Electrolyte replacement protocol/order set can help
 - Draw labs ≥ 2 hours after calcium/phosphorus/magnesium infusion complete to avoid false elevation
 - Same vs other arm irrelevant for calcium/phosphorus/magnesium

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References

1. Watson KR, O'Kell RT, Joyce JT: Data regarding blood drawing sites in patients receiving intravenous fluids. Am J Clin Pathol 1983 Jan;79(1):119-121
2. Ong YY, Boykin SF, Barnett RN: You can draw blood from the "IV arm" below the intravenous needle if you put a tourniquet in between. Am J Clin Pathol 1979 Jul;72(1):101-102
3. Read DC, Viera H, Arkin C: Effect of drawing blood specimens proximal to an in-place but discontinued intravenous solution. Am J Clin Pathol 1988;90(6):702-6.

Questions or requests...

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