A false criterion for central venous access

Dear EBP,

Central venous access devices (CVADs) entail risk, most prominently bloodstream infection and deep vein thrombosis. In hospitalized patients, central line–associated bloodstream infection (CLABSI) ranges from 2/1,000 to 5/1,000 catheter-days, for both peripherally inserted central catheters (PICCs) and short, nontunneled central venous catheters (CVCs). Silent deep vein thrombosis from PICCs ranges from 27.2% to 71.9%—posing the risk of pulmonary embolism and heightening the risk of infection. Certainly, whenever central venous access is elected, the benefits of multilumen access to the superior vena cava must outweigh these risks.

Often, the decision to insert a central line is made by vascular access specialists—generally, certified registered nurse infusion specialists (CRNIs)—using the 2011 Infusion Nursing Standards of Practice, published by the Infusion Nurses Society (INS). These standards treat the pH of a medication as an independent risk factor for phlebitis and state: “The nurse should use CVADs to administer . . . any medications with a pH of less than 5 or greater than 9.” Accordingly, vascular access specialists often see, for example, vancomycin (pH 3.6–3.9) in a patient’s order set and reflexively place a central line—regardless of the medication’s concentration, duration of administration, or length of intended therapy. My personal observation, in more than a dozen US hospitals this year, is that at least 10% to 20% of PICCs are placed with intravenous vancomycin as their sole and only indication. Because nearly 4 million PICCs are placed annually, this means that if these percentages hold generally, then between 400,000 and 800,000 patients receive central lines based on the pH restrictions of the INS standards.

Unfortunately, a review of the English literature from 1943 to the present found no human outcome studies to support the position of the INS standards. In fact, numerous well-designed clinical trials implicate factors other than pH as contributory causes of infusion phlebitis. Regarding intravenous vancomycin specifically, both in vitro and clinical studies demonstrate that this acidic antibiotic—when administered at concentrations of 2 to 5 mg/mL—causes no greater or less phlebitis than other antibiotics. Remarkably, 1 study found that patients receiving intravenous vancomycin peripherally had 7.3 times less phlebitis than patients receiving all other medications peripherally.

In summary, a false criterion for the placement of central lines has crept into the hospital environment, putting hundreds of thousands of patients at risk of bloodstream infection and deep vein thrombosis. The American Society of Health-System Pharmacists and the Centers for Disease Control do not espouse this spurious criterion; neither should the physicians who ultimately bear responsibility for the outcomes of central venous access.

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REFERENCES