Phlebotomy Top Gun
Butterfly use: The good, the bad and the ugly?

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Disclosures

• None

Which of the following are currently demonstrated to be true regarding butterfly usage....

A. Butterfly usage increases hemolysis rates
B. Butterfly needles cost more than vacutainers
C. Use of butterfly needles increases rates of percutaneous needle exposures
D. All of the above are true
Butterfly Usage

• Effects of needle size
  • *Lippi et al, Clin Chem Lab Med 2006;44:1009-14*
    • 20 adult volunteers had blood drawn 3 times using 21 G, 23G and 25G butterfly
    • Single experienced phlebotomist with all vacutainer collections
    • Serum tubes collected and processed for 14 chemical tests
    • Mean values did not differ between sizes
    • K, free hemoglobin, AST all showed greater variability in 23G and 25G (compared to 21G)
      • K 2-fold variability in 25G compared to 21G
    • Use 25G for newborns and very small veins

New Butterfly Technologies

• One vendor has reconfigured butterfly needles to minimize hemolysis
  • Thinner wall of butterfly needle, no change in overall size 25 G butterfly
  • Allows bore size for 25 G to equal that of previous 23 G butterfly
  • Multiple beveling for decreased pain
  • Vendor data suggests fill time and hemolysis rate similar to 23 G
  • Mayo data supports that conclusion
  • CLSI guidelines changed to “the use of some 25 G needles increases the risk of hemolysis and rejected specimens”
Butterfly Usage

• Risk of percutaneous exposure
  • *Patel and Tignor, Am J Infect Control 1997;25:77-84*
  • Device-specific sharps injuries Yale Univ 1993-94
  • 370 percutaneous exposures
    • 281 (76%) hollow bore needles (remaining surgical devices)
    • Among hollow bore needles:
      • Luer-lock syringes 204
      • Butterfly needles 34
      • Vacutainer needles 8
  • Butterfly rate 11.1 exposures/100,000 uses
  • Vacutainer rate 2.7 exposures/100,000 uses

Butterfly Usage

• Risk of percutaneous exposure
  • *Hotaling, JC Journal on Quality and Safety*
    • Butterfly sharps performance improvement project
    • Baseline butterfly exposure rate 3.4/100,000 compared to 1.1/100,000 for vacutainers
    • Implemented push-button retractable butterfly
    • First 9 mo butterfly rate decreased to 1.5/100,000
    • Over 31 mo decreased to 0.47/100,000
    • As or more safe than vacutainers
Butterfly Usage

• Risk of percutaneous exposure, safety sheath?
  • *Mendelson et al, Infect Control Hosp Epidemiol 2003;24:105-12*
    • 30 month before and after study at 1193 bed hospital
    • Butterfly exposure rate 13.4/100,000 before safety sheath, compared to 6.4/100,000 after safety sheath product implemented
    • Exposures occurred before activation (39%), by users choosing not to activate (32%), or during activation (21%) of safety device
    • Still had high rate of exposures, most related to safety device use
    • Don't bother with re-sheathable products

Butterfly Usage

• Why do nurses choose butterfly?
  • *Downing, Yoder, Kirksey, Medsurg nursing 2011;20:291-291-5*
    • Qualitative study of 11 nurses and 14 CAs
    • Why do you choose vacutainer vs butterfly
    • Interviews reported and content analysis for themes
    • Many nurses passionate predilection for butterfly
    • Four choice factors emerged as themes:
      • Mechanical features of butterfly
      • Manual manipulation ability of butterfly
      • Patient comorbidity (higher with CA)
      • Vein quality (higher with CA)
Summary of Butterfly Usage

- Many old reasons not to use butterfly needles no longer apply
- They do cost more
- They could still increase hemolysis or clotted rate, especially for large blood draws or when small gauge used on adult
- More dangerous for staff if lacking one hand safety activation
- Strategies to limit butterfly usage
  - Train staff with vacutainer, train to draw by feel not site
  - Educate staff on pros and cons of butterfly needles
  - If that doesn’t work, limit butterfly availability in areas not likely to need them

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Thank You