Arterial Catheterization: A review of current clinical practice

Amy Bardin-Spencer, EdD(c), MS, RRT, VA-BC™ – Senior Clinical Marketing Specialist, Teleflex

BACKGROUND
Arterial catheters are routinely placed by multiple disciplines within an organization. These catheters have both significant benefits and risks for critically ill patients. Recent evidence demonstrates the need for a standardized approach to arterial catheter insertion and maintenance to reduce procedural and dwell-associated risks to this patient group.

PURPOSE
To demonstrate the variance from procedural guidelines for arterial catheter insertion and maintenance, comparing current practices identified to best practice recommendations.

METHOD
An electronic survey about arterial catheter insertion and maintenance practices was circulated to current, active AVA members. 22 questions defining local clinical practices were compared to empirical published clinical guidelines to identify potential variance. The guidelines used for comparison were the currently quoted supportive literature based on recommendations from the Centers for Disease Control (CDC), Infusion Nurses Society (INS), Society for Healthcare Epidemiology of America/Infectious Diseases Society of America (SHEA/IDSA) and the Joint Commission on Accreditation of Healthcare Organizations. The survey also included questions regarding the opportunity to add arterial catheters to current vascular access teams, and about the percentage of vascular access specialists currently inserting or wanting to add arterial catheter insertion to their practice.

RESULTS
Q3. Do you currently insert arterial catheters?

- Yes: 70.9%
- No: 29.1%

Q7. How many arterial catheters are required per your hospital policy/credentialing process to achieve competency?

- 1: 10.0%
- 2: 20.0%
- 3: 30.0%
- 4: 40.0%
- 5: 50.0%
- 6: 60.0%
- 7: 70.0%
- 8: 80.0%
- 9: 90.0%
- 10: 100.0%
- Never: 0.0%

Q9. During pre-assessment for arterial catheter insertion is it your practice to perform an Allen’s test?

- Yes: 84.1%
- No: 15.9%

Q10. When inserting arterial catheters, how often do you use ultrasound guidance?

- Always: 10.0%
- Regularly: 20.0%
- Sometimes: 40.0%
- Rarely: 20.0%
- Never: 10.0%

The survey also demonstrated the need for a standardized approach to arterial catheter insertion and maintenance, comparing current practices identified to best practice recommendations. To demonstrate the variance from procedural guidelines for arterial catheter insertion and maintenance, comparing current practices to best practice recommendations.

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RESULTS CONTINUED

A total of 172 vascular access specialists responded to the survey. Fifty (29%) clinicians identified arterial catheterization as being within their scope of practice in various states within the USA. A small portion of respondents were international.

The average identified number of arterial catheter insertions required for procedural competence was 10.

Of the 44 who answered the question, 84.1% do the Allen’s test prior to radial artery catheterization. In addition, 53.3% do post insertion monitoring of the device and 37.2% monitor arterial catheter dwell times.

Surprisingly, 70.7% of clinicians stated they use an impregnated dressing at the insertion site, yet 34.9% did not monitor institutional infection rates. Ultrasound use for insertion was 80% while only 20% of clinicians used ultrasound after a blind attempt if difficulty or failure was encountered.

Most of the empirical guidelines recommend the use of a dedicated procedural kit. 53.5% of respondents indicated they used such a kit. Only 51.7% of respondents indicated that they use a procedural cart.

Securement of arterial catheters was somewhat lower than current guideline recommendations, and only 51.2% used a sutureless securement device and 55.8% used only a transparent dressing. 71.4% of respondents use heparin to maintain patency even though that practice is not an INS recommendation.

Learning arterial device insertion was highlighted as still a mixture of facility-based training (77.5%) and dedicated arterial courses, incorporating ultrasound (42.5%) but these results were combined across respondents.

CONCLUSIONS

Arterial catheter insertion practices are not consistent among the surveyed vascular access clinicians. Survey results show that a higher level of compliance is required for arterial catheter insertion to reduce both complication and infection risk in the critically ill population. Of the clinicians surveyed, the results identified several areas to optimize best practices, including the regular use of ultrasound, required inclusion of an Allen’s test pre-procedure, identification of a preferred securement option, thorough device surveillance and maintenance of a satisfactory average number of insertions for procedural compliance.

REFERENCES

Vascular access specialists that include arterial catheter insertion, follow empirical recommendations and incorporate clinical surveillance into practice, help optimize patient outcomes, improve procedural compliance and decrease risk within their institution.

DISCUSSION

Most of the empirical guidelines recommend the use of a dedicated procedural kit. 53.5% of respondents indicated they used such a kit. Only 51.7% of respondents indicated that they use a procedural cart. Securement of arterial catheters was somewhat lower than current guideline recommendations, and only 51.2% used a sutureless securement device and 55.8% used only a transparent dressing. 71.4% of respondents use heparin to maintain patency even though that practice is not an INS recommendation.

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IMPLICATIONS

Vascular access specialists that include arterial catheter insertion, follow empirical recommendations and incorporate clinical surveillance into practice, help optimize patient outcomes, improve procedural compliance and decrease risk within their institution.