

# Troubleshooting Vascular Access Device Selection

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## Purpose Statement

To educate registered nurses that work in critical care and general care areas on the necessity for the pre-assessment of patient risk factors and the importance of appropriate vascular access device (VAD) selection for the clients in their care.

## Project Question

Will providing education to critical care and general/progressive care nurses, on VAD and assessment of patient risk factors, improve RNs understanding of VAD selection?

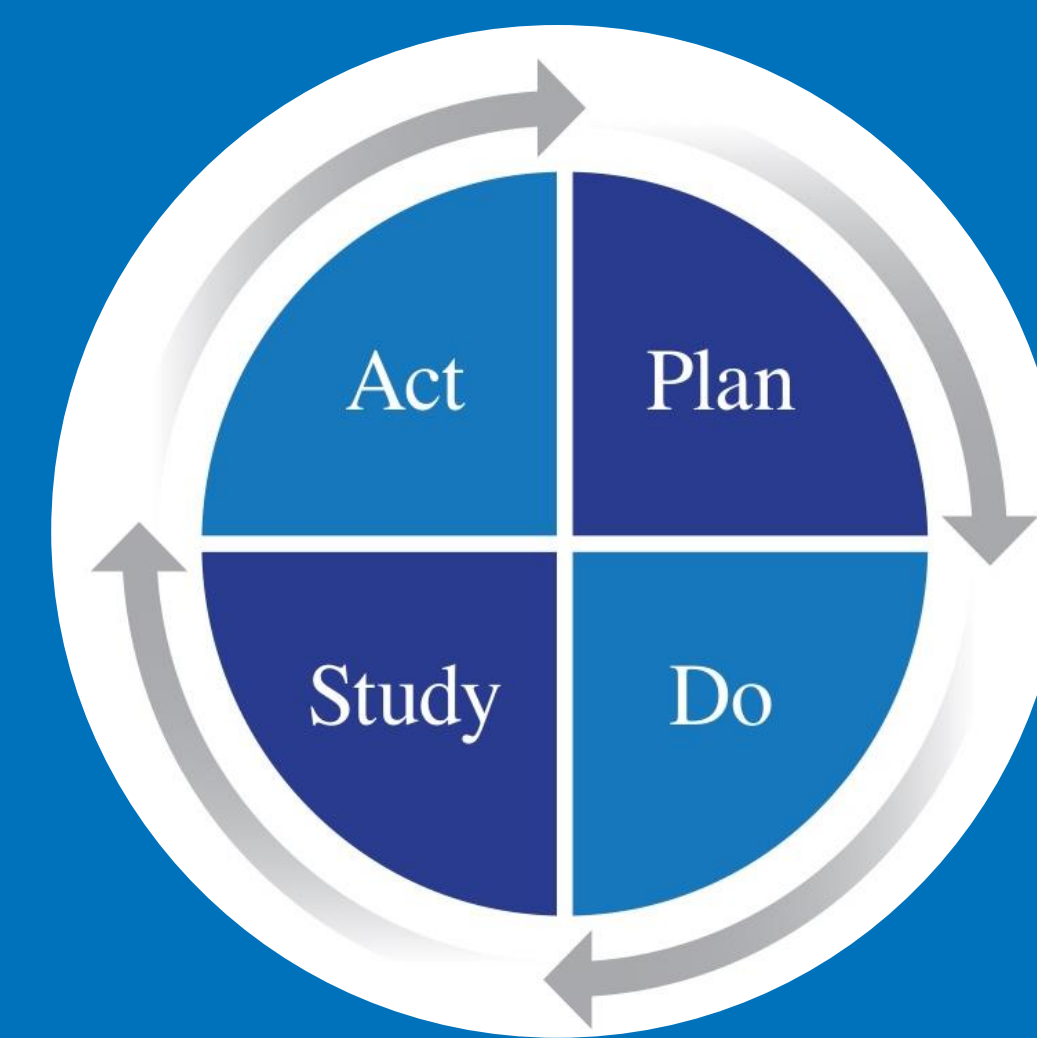
## Literature Review

- During vascular access device selection, it is important to select the fewest lumens needed for patient care, each additional lumen adds an exponential increase in risk for CLABSIs & complications (Dobbins et al., 2003; Walter & Price, 2019).
- Appropriate device selection, inserter competence, and adherence to infection prevention principles are major factors of patient safety (Hill, 2019; Martillo et al., 2019).
- Knowledge gaps identified related to appropriate indications for CVC use (Chopra et al., 2015; Kelly et al., 2019)
- Vessel selection frameworks give clinicians autonomy to select the right vascular access device at the right time for the right patient (Weston et al., 2017).
- Strategies to avoid unnecessary central venous catheters are necessary to reduce CLABSIs (Galen et al., 2018)
- Selection of the correct vascular access device requires the use of an algorithm to provide the patient with a patient-centered device (Moureau et al., 2019)
- Unmet need to define indications and promote utilization that conforms to optimal use of CVCs (Woller et al., 2016)

- Most BSN curriculums are not providing vascular access and infusion nursing (VAIN) education; employers must bridge the gap to ensure competence in VAIN (Marchionni et al., 2018).

## Framework

### Plan, Do, Study, Act Cycle



- The Plan, Do, Study, Act (PDSA) cycle is a model that provides an outline for developing, testing, and implementing change that leads to organizational improvement (NHS Improvement, 2018).
- **Plan:** knowledge deficit regarding appropriate VAD selection identified  
**Do:** education implemented and quiz scores recorded  
**Study:** data reviewed  
**Act:** process reviewed, revised, and implemented on a larger scale

## Methods

### Project Design and Setting

The project's setting included critical care and general/progressive care areas at Midwestern medical center.

### Stakeholders

Clinical Nurse Educator & Clinical Nurse Specialist

### Permission:

Obtained from stakeholders via Permission to Conduct QI project email.

## Project Procedure

- The participants on selected units were given education using PowerPoint during competency, nursing staff meetings, and in-services.
- The education provide comprehensive vascular access education on pre-assessment of patient risk factors and importance of appropriate VAD selection in clients.
- The participants completed a pre-test, received education, and then completed a post-test to determine understanding of educational information.
- The results were utilized to write recommendations for improved VAD selection and continued vascular access education needs.
- Providing education to the nursing staff may decrease the number of inappropriate VAD selection. The education will be deemed successful as evidenced by increased post-education test scores and long-term reduction in CLABSI rates.
- Participants were eliminated if unable to complete both pre and post tests.

## Data Collection

- Data were collected on pre/post knowledge of assessment of patient risk factors and the importance of appropriate VAD selection in clients via pre/post surveys.

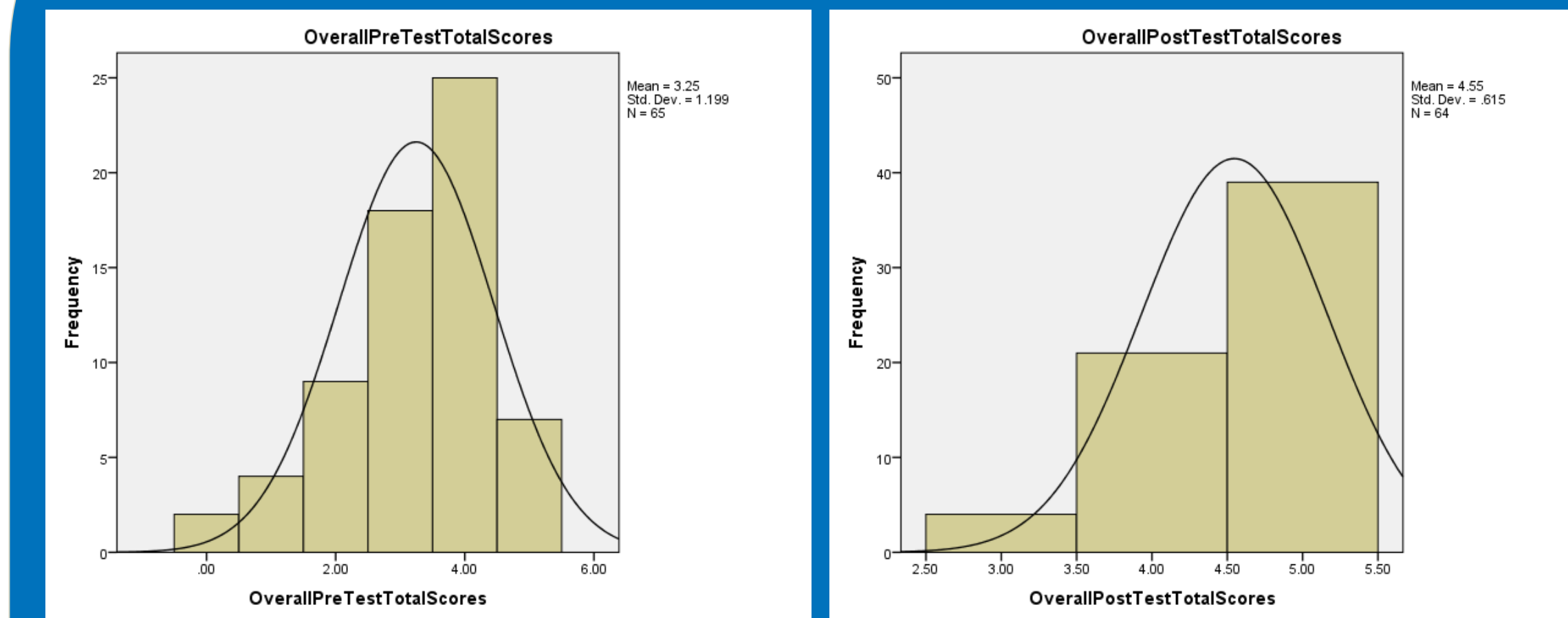
## Data Analysis

- Paired t-tests were utilized to compare pre and post test scoring to determine statistical significance.

## Ethical Considerations

- De-identified, coded data stored via password protected computer only accessible by the team members.

## Results



## Project Outcomes

### Outcomes

- Vascular access device education was beneficial for all units piloted
  - General/progressive care units demonstrated the most gain from the education
- Providing annual education would be beneficial
  - Annual competencies
  - Medicine is dynamic, constantly changing
- Recommend that each unit has a individualized vesicant list posted
  - Posting of the device selection criteria handout would be beneficial
  - Combining the vesicant and device information list may improve utilization

### Outcomes

- Need for more frequent review of port access for nursing staff
  - Physicians
  - Midlevels
- Need for improved central line occlusive dressing
  - Staff voiced concerns that current dressing does not maintain adhesiveness, leading to an increase risk for CLABSI
- Education needed regarding tunneled powerlines to all staff

## Discussion

### Project Evaluation

- The project question was supported by the outcomes, as evidence by improved post education scores.
- Each step of PDSA cycle was utilized during the research process.
- SMART objectives were met.
- The location of the education session can be detrimental to the learning outcomes.
- The quizzes reflected real life case scenarios
- Future testing consideration should review test question verbiage to be more succinct and unit directed.

### Conclusion

- VAD selection education did improve the knowledge of the registered nurses regarding appropriate VAD selection.
- Disseminate education to all units within the next three months, then commit to implementing annual education throughout the facility.