

# A SURVEY AND AUDIT OF CENTRAL VENOUS CATHETER INSERTION TECHNIQUES BY DOCTORS IN THE DEPARTMENT OF ANAESTHESIOLOGY AT STEVE BIKO ACADEMIC HOSPITAL

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Representation of answers for insertion point (red) and aim (blue) for subclavian vein CVC placement

## INTRODUCTION

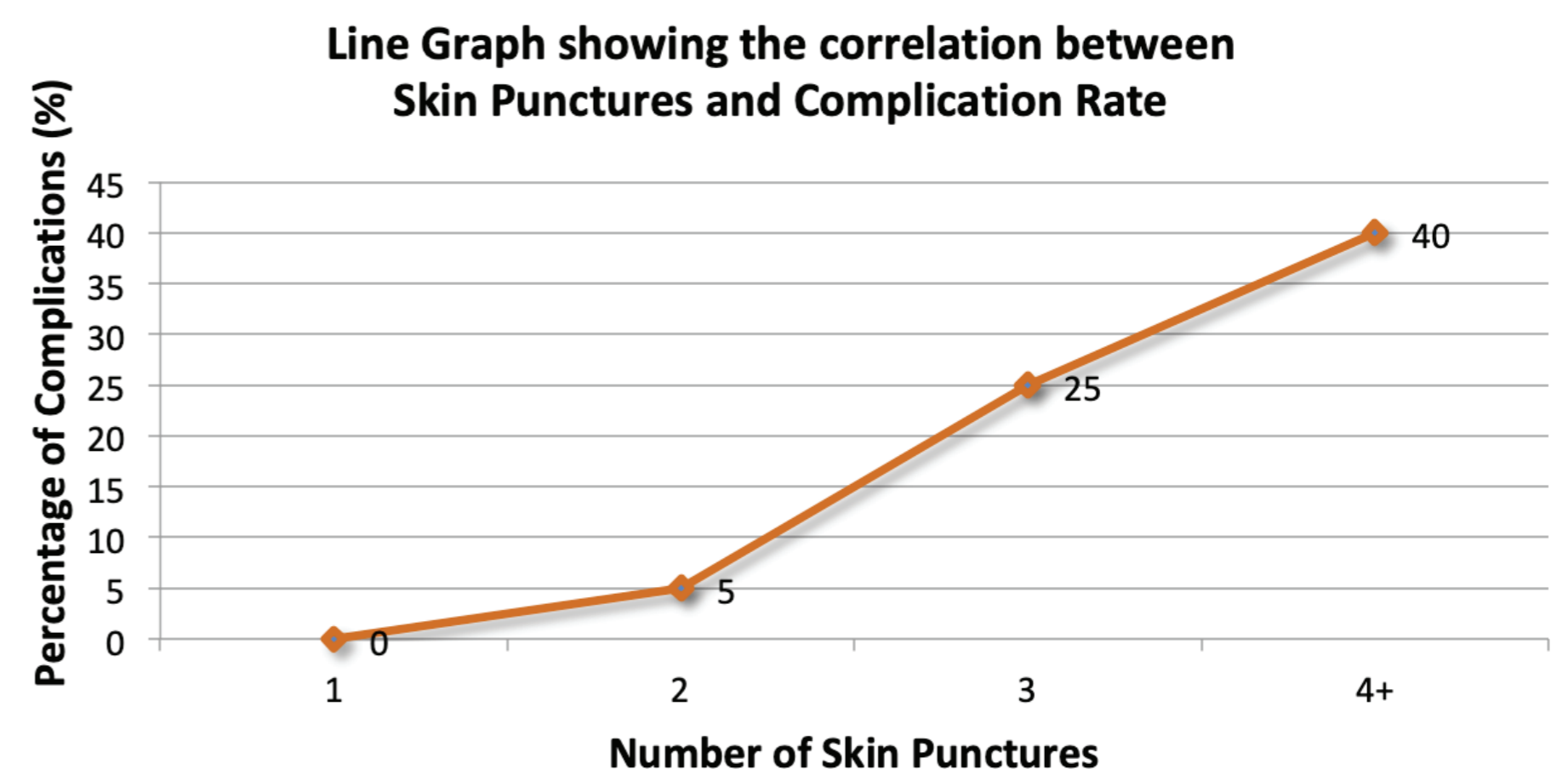
- The American Society of Anaesthesiologists emphasize the wbest practice for central venous catheter (CVC) insertion is an ultrasound-guided technique.
- In a resource-limited environment this cannot always be used, therefore it is imperative that practitioners are well-acquainted with the landmark-based techniques.
- Suboptimal knowledge thereof results in increased attempts which in turn increases the risk for complications.
- The purpose of this study was two-fold, firstly to assess the knowledge of doctors in the department of anaesthesiology at Steve Biko Academic Hospital (SBAH) on landmark-based CVC insertion techniques and secondly, to audit the frequency and details of CVC insertion at SBAH.

## METHODS AND MATERIALS

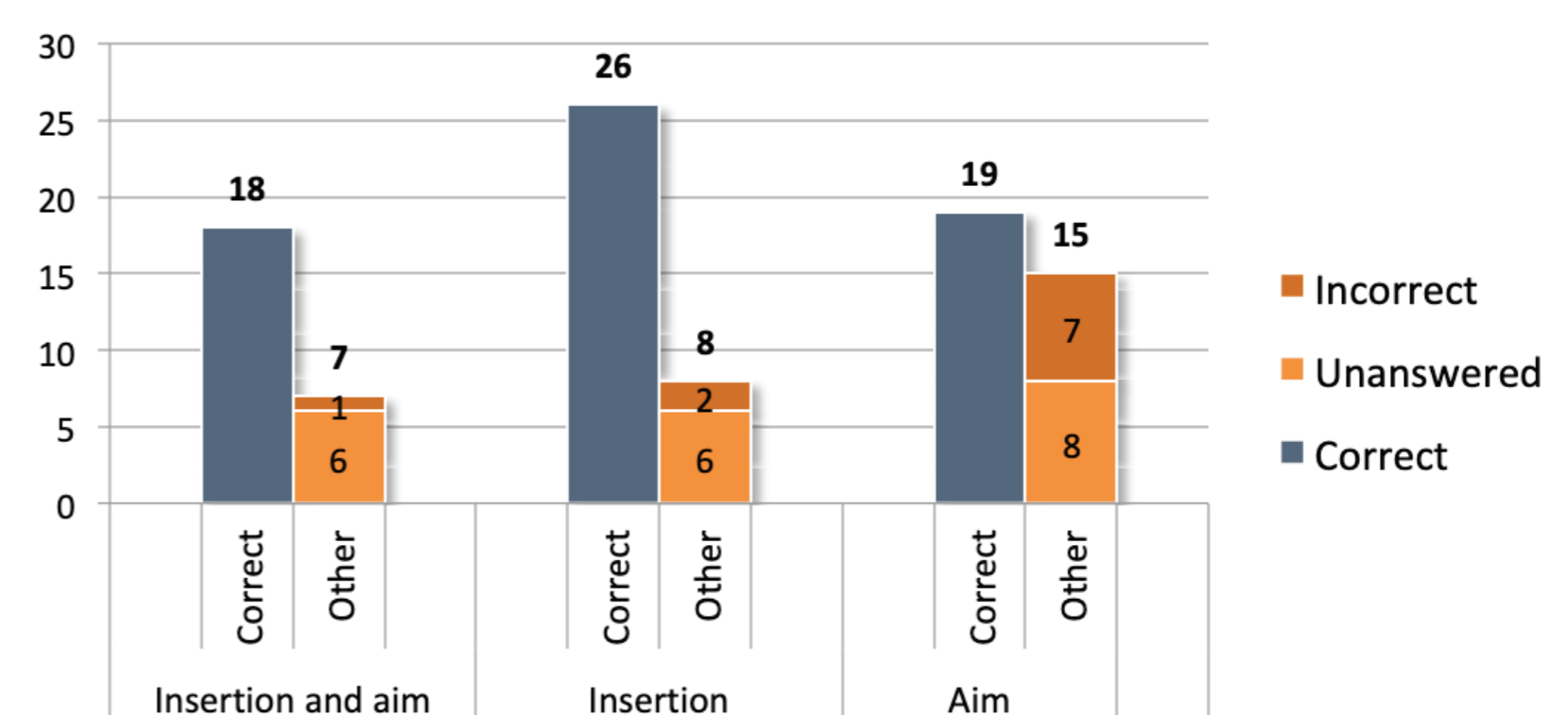
- Ethics committee and doctors' consent for participation was obtained.
- Anonymous paper questionnaires were used to evaluate each doctor's anatomical knowledge under test conditions, by asking them to indicate the insertion point and aim for the various approaches on a clinical photograph.
- The secondary aim of the study was a three month prospective audit (1 September 2019 to 30 November 2019) from which information on every CVC insertion in theatre was obtained by completion of a questionnaire.

## RESULTS

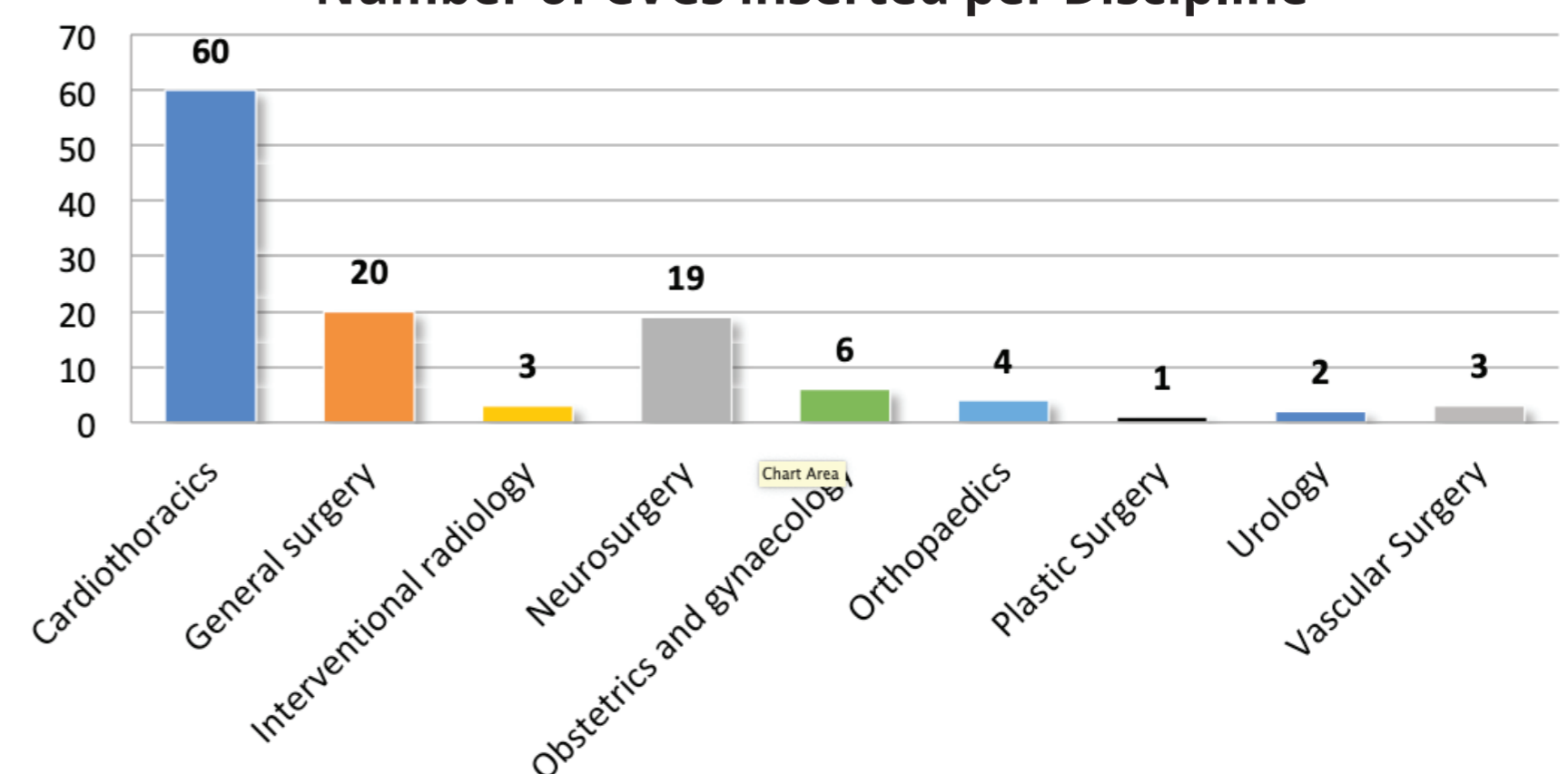
- Of the 34 doctors surveyed 11 described their preferred approach for CVC insertion correctly.
- The average number of successfully answered approaches was 1 out of 4
- Despite not being the overall preferred site, the subclavian vein was the site that scored the highest in terms of the doctors' knowledge.
- A total of 118 CVCs were inserted, comprising 2.9% of all theatre cases.
- Leading indications for which were inotrope infusion and central venous pressure monitoring.
- The initial cannulation failure rate of 7.6% was overcome by a colleague inserting the CVC.
- The number of skin punctures ranged from 1 to 20, with the average being 2.
- The 9.3% complication rate consisted equally of haematoma and arterial puncture with only 1 pneumothorax reported.
- The incidence of complications increased directly with the number of skin punctures made. This was 0% for 1 puncture and up to 40% for 4 or more punctures.



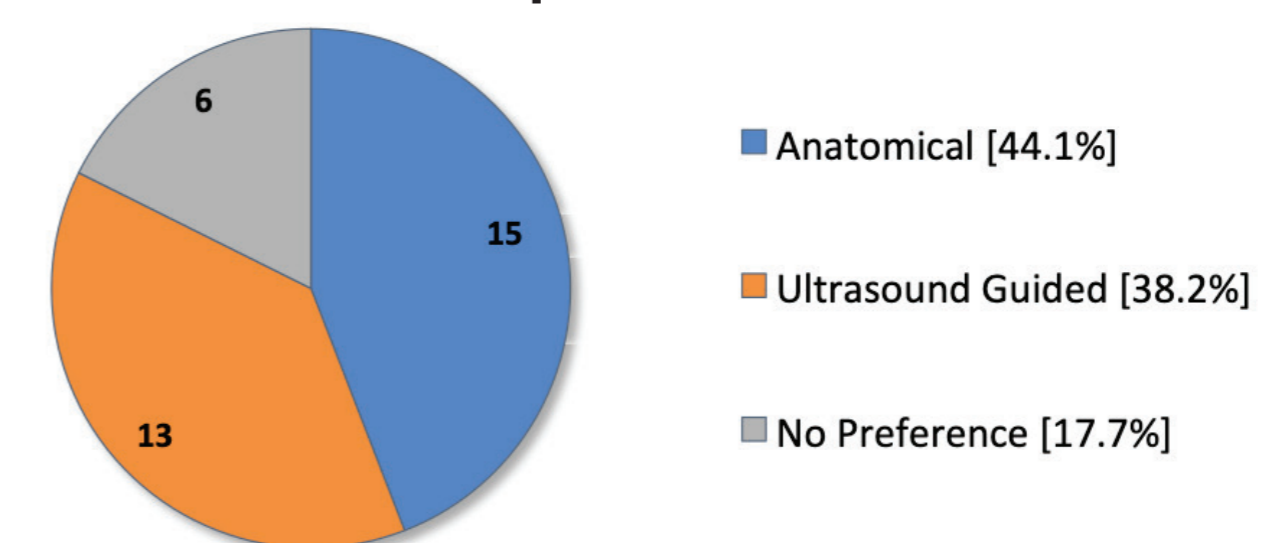
### Responses to the Subclavian Approach



### Number of CVCs inserted per Discipline



### Preferred Technique for CVC Insertion



## DISCUSSION

- The primary survey highlighted deficits in the subjects' knowledge of the anatomical approach to CVC placements.
- The 9.3% complication rate correlated with the number of attempts, thus emphasizing the need for ongoing periodic training to improve patient outcomes.
- The fact that 10.1% of cases required doctors to change the method of their initial attempt stresses the importance of doctors being proficient in various techniques, sites and approaches involved in safe CVC insertion.

