

# The use of the mini-midline venous catheter in the surgical area: The experience of the surgical department in Piacenza local health authorities

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## ABSTRACT

The activities most carried out by the nursing staff concerns the retrieval

of venous accesses. The placement of the various devices available, allows you to take blood samples, administer drugs, infusions, medicinal substances and infuse blood products.

**Key Words:** *Surgical area; Venous catheter; Cannula; Piacenza local health authority's*

## INTRODUCTION

The placement and use of the various devices on the market can take place both in the hospital environment in the various care settings such as the emergency room [1-4], in the hospital wards, in the operating rooms but also in the out-of-hospital setting at home of the patient or in the emergency situations.

The nurses are responsible of positioning and managing short peripheral venous catheters but in recent years, other peripheral catheters devices have emerged placeable with echo-guided technique, extend the choice of devices.

The assess that must indicate the identification of the most suitable device depends on the conditions of the candidate for venous access, on his venous patrimony, on the therapies to which he will be subjected, on the length stay in hospital, on the possible complications, on the clinical path way and the preferences expressed and shared with the patient [5].

A device increasingly used in care settings is the long peripheral cannula, also known as the short midline or mini-midline.

In the literature, is present a terminological confusion [6] for simplicity in this paper, we will use the term mini-midline.

It is a device composed of a cannula with a length between 6 and 12 centimeters with a caliber between 18 and 22 gauge, it is composed of polymer, it is placed in the superficial veins of the arm and forearm or in deep veins whit the use the via echo-guided with Seldinger technique whose tip does not exceed the axillary cavity.

Substances compatible with the peripheral venous system can be infused but the advantage of the mini-midline is represented by the time spent in situ which varies between 10 and 20 days [7].

Nevertheless, in a scientific paper where patients with difficulty in finding a peripheral venous access were studied, the onset of complications such as accidental removal, occlusion, extravasation, dislocation, thrombosis and infection, between 6- and 12-centimeters cannulas were compared like the mini-midline, and it has emerged in a statistically significant value, that the long cannula devices, would allow to reduce the mentioned complications [8].

A rapid review was conducted to verify the publication of previous experiences in the surgical area on the use of mini-midlines.

The search for scientific articles was carried out on biomedical electronics libraries such as PubMed, Cochrane Library, Cumulative Index to Nursing and Allied Health Literature (CINAHL) through the following search string: (((minimidline) OR (mini-midline)) OR ("short midline")) OR ("long peripheral venous catheter")) OR ("long peripheral venous cannula") Filters:

in the last 10 years, Humans, English, Italian, Adult: 19+ years; the gray literature relating to the subject matter was also consulted.

Some scientific works have been retrieved that were mainly focused on the emergency department and intensive care units.

## AIMS AND SCOPE

The aim of this work is expected at testing the main criteria for choosing the mini-midline through a recommendation flow-chart on the appropriateness of device selection as well as examining the data set on the use of the mini-midline in the surgical area.

## METHODS

The experience reported in this report was developed between June 2019 and May 2021 for a total of 24 months at the surgical general ward and in the emergency surgery area of the surgical department in Piacenza General Hospital.

The training and skills acquisition aspect in the field was conducted by the vascular access team belonging to the onco-hematological department of the Piacenza General Hospital.

The structure described in this paper tends to standardize care behaviors and provide of nurses with a tool that can guide them towards an appropriate choice of the venous access device, referring to scientific guidelines Infusion Therapy Standard of Practice scientific guidelines [9] and recommendations SIIARTI of good practice for vascular accesses [10].

It has been implemented the flow-chart inserted in the clinical documentation of the surgical areas involved.

It allows identifying the peripheral venous access devices with short or long cannula to be applied and also directs the possible option towards central venous catheters with peripheral and non-peripheral insertion.

The selection of the various instruments was shared with the patient and as regards the central venous catheters, the decision on their placement was discussed with the physician's component who requested them from the team for venous access.

The implementation of these practices was possible whit to specific training, in which three nurses from the surgical general ward and the emergency surgery area were identified who, in addition to the usual institutional activities, have assumed the role of specifically trained implants for mini-midlines.

In addition, internal training has been planned for the surgical department focused on the application and management of all vascular access devices.

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TABLE 1

Shows the results described above referring to the plant activity.

Mini-midline	n.	%	Average	Standard Deviation	Range
Applied devices	95				
Basilica vein	71	74,4%			
Cephalic vein	24	25,6%			
Number of attempts			1,23	± 0,55	1-5
Days of stay			7,04	± 5,09	1-30
malfunction	7				
Device break	1				
Device occlusion	5				
Device location	6				
Thrombophlebitis	2				
Replacement with central catheters	7				

The data collected in this analysis were reported and processed through Microsoft excel 2007®.

### RESULTS

95 mini-midlines were placed, of which 74.4% (71) in the basilica vein and 25.6% (24) in the cephalic vein.

In 3 cases, the decision to place a mini-midline did not meet the selection criteria, there were 7 cases of device malfunction, 1 breakage of the Luer-lock mechanism, 5 episodes of catheter occlusion and 6 dislocations of the same of which 2 cases for self-removal by the patient.

There were also 2 thrombophlebitis events and in 7 cases the mini-midline was replaced with central catheters.

The device applications required an average of 1.23 attempts [ $ds \pm 0.55$  (range 1-5)] and the average maintenance times of the device were 7.04 days [ $ds \pm 5.09$  (range 1-30)] (Table 1).

According to a previous study of ours [11], the patients eligible for this device in a surgery area of medium complexity, would be about 14% but from the data collected in this analysis, only 6% underwent this procedure.

### DISCUSSION

In other published scientific papers, regarding the indicators reported in this study, overlapping results emerge regarding the number of placement attempts and the various complications described [1,3,7,8].

The use of the mini-midline in surgical areas appears appropriate as it allows a venous catheter to be kept in place for a period in line with the hospitalization times of the target patients in the mentioned setting.

It is also a safe device as reported in this study, there were 19 problematic events such as dislocations, occlusions, and malfunctions equal to 20% of all the devices applied.

It is also foreseeable that patients will be more comfortable as a result of the decrease in venipuncture due to the application of short cannula venous catheters as well as previous practice; furthermore it represents a condition of greater clinical safety whit to the possibility of having a suitable venous access for medium/high complexity or patients in critical conditions.

### CONCLUSION

From the data collected and from what it is a present in the scientific literature, it is highlighted that in surgical care settings, there is a quota of patients eligible for the positioning of mini-midlines.

The indispensable condition to be able to implement a systematic process of

assessment, application and management of the mentioned devices, remains the training and training towards their use and nevertheless the number of applications that allow maintaining the skills of nurses.

The analysis presented could result as an information data to implement further more structured studies and possibly to deepen the experiences of patients through scientific studies with qualitative research design.

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