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ECONOMIC AND ORGANIZATIONAL IMPACT OF A VASCULAR ACCESS TEAM IN AN ITALIAN HOSPITAL

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Introduction
Central Venous Catheters enables rapid and reliable intravenous administration of drugs and fluids. In this setting, a Peripherally Inserted Central Catheter (PICC) is a form of intravenous access that can be used for a prolonged period of time. The use of this device generates several advantages: decreases the risk for catheter occlusion and complication and can be inserted by trained nurses1,2. In the Italian setting, the creation of specific Vascular Access Team (VAT) dedicated to the central catheters insertion is increasing. The objective of this study was the identification of clinical/economic and organizational impacts of the introduction of a Vascular Access Team in an Italian hospital.

Methods
The analysis was performed through the estimation of the savings associated with the reduction of complication rate (i.e. catheter related infections) and with the changes in the medical/technical staff involvement (Table 1 and Table 2) for catheter implantation, in terms of both staff involved in the patients’ management and competences needed. The economic and organizational impact analysis was performed in a single hospital for two different scenarios (Figure 1): pre- and post-VAT creation, respectively scenario 1 and scenario 2.

Figure 1. Scenario analysis

PTV pre PICC Team
Hospital with a significant number of catheters implanted without a dedicated Team

PTV post PICC Team
Hospital with a significant number of catheters implanted with a dedicated Team

The identification of the hospital was based on its significance in terms of number of procedures (about 2,600 catheter insertion per year) and healthcare professionals (HCPs) involved. The two scenarios were compared in terms of: number of catheter implantations and devices used (Chest Inserted Central Catheter (CIC), PORT or PICC), HCPs involved, catheter-related infections, costs of staff, devices and other infections. Data were obtained from different sources: literature review; interviews with clinicians and nurses. Interviews were conducted using a questionnaire with both open and multiple-choice questions.

Table 1. Number of implants, infection incidence and time dedicated to the implant of the different kind of catheters in the two scenarios.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Number of PICC inserted</th>
<th>Number of CVC inserted</th>
<th>Number of PORT inserted</th>
<th>Number of device days</th>
<th>Infection incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>250</td>
<td>1,489</td>
<td>28</td>
<td>6,475</td>
<td>24/2,890 Catheter days</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Costs inputs used for the scenario analysis.

<table>
<thead>
<tr>
<th>PROFESSIONALS</th>
<th>Cost</th>
<th>Devices</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

Results
The study showed that the introduction of the VAT in the analyzed hospital generated an increase in the number of catheter insertions (2,626 in scenario 2 compared to 1,764 in scenario 1) and in savings (about 946,000, Table 3) thanks to a significant reduction of catheter-related infections incidence (14 per 1,000 catheter days in scenario 1 and 0,6 per 1,000 catheter days in scenario 2) and a better HCPs management (Table 1).

Table 3. Cost comparison in the 2 scenarios

<table>
<thead>
<tr>
<th>COSTS COMPARISON</th>
<th>Scenario 1 (PTV pre Vas. Team)</th>
<th>Scenario 2 (PTV post Vas. Team)</th>
<th>Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devices</td>
<td>48,813€</td>
<td>135,127€</td>
<td>86,314€</td>
</tr>
<tr>
<td>Implant procedures</td>
<td>44,630€</td>
<td>53,815€</td>
<td>9,179€</td>
</tr>
<tr>
<td>Infections</td>
<td>1,218,322€</td>
<td>176,002€</td>
<td>-1,041,320€</td>
</tr>
<tr>
<td>TOTAL COSTS</td>
<td>1,311,575€</td>
<td>365,634€</td>
<td>-945,941€</td>
</tr>
</tbody>
</table>

Conclusions
The present study indicates that the introduction of a VAT can generate a series of benefits: better catheter management, savings due to decrease of infections incidence and to a better use of HCPs, decrease of CVC and PORT inappropriate implant, continuing professionals’ development and better internal training.

References
1. A PICC: Comparison of outcome of percutaneous venous punctures, 160 Italian centers. 
2. A PICC: Comparison of outcome of percutaneous venous punctures, 160 Italian centers. 
3. A PICC: Comparison of outcome of percutaneous venous punctures, 160 Italian centers. 

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