Evaluation of a frozen logistics circuit implementation

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BACKGROUND AND OBJECTIVES

- Hospital pharmacy in Toulouse (Logipharma) : Logistics platform, located remotely from healthcare services.
- 2 types of supply chains :
  - stock products (→)
  - off-stock products ( not stored in the pharmacy) (←→)
- New hemostatic specialty Tisseel® (fibrin sealant) replaces Tissucol®. According to the SPC (Summary of Product Characteristics), Tisseel® must meet special storage conditions.

  - Tissucol®
    - Stored in the refrigerator (2 to 8°C).
    - Current supply chain : stock product
    - Current delivery : refrigerated (using usual coolers ensuring temperature between 2 and 8°C).
  - Tisseel®
    - Frozen ≤ -20°C
    - Without any possible temperature excursion
    - Needed Frozen delivery

  → Tisseel® supply chain : Stock or Off-stock product?
  → To determine the implementation modalities of a frozen logistics circuit from receipt to delivery of drugs to the healthcare service.
  → To estimate the needs and necessary costs for the establishment of such a circuit.

MATERIALS AND METHODS

- Retrospective analysis : from January 2015 to July 2015
- Evaluation of Storage and transportation needs
- Estimation of Tisseel® stock from Tissucol® data of three dosages (average stock)
  → Evaluate our storage volume in a freezer
- Assess the number and capacity of coolers necessary for delivery to healthcare services
  → Consumptions extraction from warehouse management system Copilote®
  → Determine the number of consumer services, and the average number of shipment

RESULTS

1st Hypothesis : stock

<table>
<thead>
<tr>
<th>TISSUCOL® KIT 5ML, 2ML,1ML</th>
<th>TISSEEL® 10ML, 4ML, 2ML</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum stock level</td>
<td>Maximum storage capacity</td>
</tr>
<tr>
<td>calculated on ADC</td>
<td>calculated on ADC</td>
</tr>
<tr>
<td>80</td>
<td>67 L</td>
</tr>
<tr>
<td>observed</td>
<td>81</td>
</tr>
<tr>
<td>ADC → Average daily Consumption</td>
<td>68 L</td>
</tr>
<tr>
<td>(1 Tisseel package = 0.836 L)</td>
<td></td>
</tr>
</tbody>
</table>

- Volume required for storage of 3 dosages of Tisseel® : estimated at 68 liters. (and 14 L for storage of 2 others frozen products, currently stored in a smaller freezer).
- Every week, about 17 coolers with a capacity of 3.5 liters will be needed to transport Tisseel® from the platform to consumer services.
- Total equipment requirements :
  - Freezer with a capacity of at least 82 L
  - 17 coolers
- Issue : Our current coolers and those offered by the laboratory do not guarantee a temperature below -20°C during our delivery time (3 hours maximum)
  → not suitable for our logistics circuit
- Evaluation of new coolers purchase : Coolers with eutectic plates guaranteeing transport at -20 °C for 3 hours.
  → represents an additional total cost of €4488

2nd Hypothesis : off-stock

- Laboratory will deliver Tisseel® in container with dry ice (Shelf life in the shipping box with dry ice = 72hours)
- Receipt and check of the quantities then delivery (in the shipping box) to the healthcare services
- Total equipment requirements :
  - 10 pairs of cryogenic gloves (used in the healthcare services to handle dry ice) → represents a €1979 total extra cost

CONCLUSIONS

Tisseel® cannot withstand temperature excursions, which represents a significant additional cost for our hospital, if it is stored in our pharmacy. To secure the circuit of frozen products, we have decided to focus on off-stock circuit that represents a smaller cost. Each service will place an order with the supplier. Then we will carry out the delivery of medicines, using the delivery box with dry ice of the laboratory.

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