Improving The Utilization Rate of The Surgical Packages

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Background:
The objective of this project is to reduce the re-stereilization rates of surgical instrument packages. Good management of surgical instruments facilitates surgical operations and ensures patient's safety, while the poor disposition of instruments wastes resources. There were 9,259 expired surgical instrument packages in 2011 and the re-stereilization rate was 20.3%. Because these packages were not utilized on time, the manpower, material, and time were wasted on unpacking - sterilization - storage - checking packs with time-sensitive expiration dates, etc., resulting in a higher expenditure. Therefore, we were motivated to improve the utilization rate.

Trails of Use:
This unit consists of 28 professionals (including one head nurse, two leaders, seventeen technicians, and two assistants). As for instruments, firstly, 617 types of packs and 879 surgical instrument packages in stock to be utilized in various surgical operations by the surgical operation unit. The average number of surgical operations in a year is 1,497, utilizing 3,960 surgical instrument packages in a month. Two sterilization methods of surgical instrument packages are applied: high or low temperature. The selection of packaging material is based on the sterilization method. The packages were tagged every linen after seven days and those by pouches expire after three months. Every day the storage and staff inspect all packages in the storage area for expiration date and pick out packages which expire in ten day and packages which have expired. Then those packages are unpacked, inspected, sterilized and put back to the instrument racks. After this process is done by the responsible staff, the utilization rate of the re-stereilized and utilized packages at this shift are registered in the file on a computer.

Establishment of Problems

1. Staff: no knowledge of the instruments which share the same function and can be substituted for one another; no compliance with the first-in-first-out rule.

2. Management: no review and analysis on a regular basis regarding the usages of packages; no monitoring on a regular basis the operation quality in the storage area; no training regarding the operation of surgical instrument packages.

3. Equipment: limited sources of packing material (only linen and pouches); no warning labels of expiration date on packages.

Set up target: re-stereilization rate of expired packages - (re-stereilization rate of expired packages × 6 problems needing to be fixed) / abilities of staff to improve = 60.3% → 20.3% - (20.3% × 70%) / 70% = 10.4%.

Results

1. Re-stereilization rate before improvement, 20.3% → 10.4%.
2. Manpower before improvement, 102 minutes → 88 minutes (saving of 14 minutes).
3. Expenditure: before improvement, USD $771.6/month → $405.3, with a saving of $366.3.

Table 1: The variation of surgical surgical instrument packages before and after improvement

<table>
<thead>
<tr>
<th></th>
<th>Before improvement</th>
<th>After improvement</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expiration rate</td>
<td>25.9</td>
<td>13.8</td>
<td>-47.1%</td>
</tr>
<tr>
<td>Use rate</td>
<td>29.2</td>
<td>69.4</td>
<td>136.1%</td>
</tr>
<tr>
<td>Utilization rate</td>
<td>51.6</td>
<td>75.0</td>
<td>45.1%</td>
</tr>
<tr>
<td>Usage rate</td>
<td>149.2</td>
<td>86.8</td>
<td>-42.5%</td>
</tr>
<tr>
<td>Average unit/day</td>
<td>8.8</td>
<td>10.4</td>
<td>17.6%</td>
</tr>
</tbody>
</table>

Conclusions

1. Facilitator: This can promote the working efficiency and lower the manpower and expenditure, winning the support from colleagues.
2. Barrier: This may cause the problems of coordinated operation with leaders of all departments in surgical operation unit and doctors,
3. Limitation: As the development of medical technology progresses, new types of instrument are used constantly. New doctors take their jobs and old types of instruments are piled up. Besides, linen packaging is still the packaging method of choice, account for 62.5% of all surgical packs in my unit. The selection of reusable linen is impacted by cost and environment issues (Central service technical manual, 7th ed., pp. 241). Disposable paper or rigid container have longer expiration dates (5–6 months) than linen (7 days), but based on the limitation of budget every year, rigid containers account only for 5% of total surgical packs ($1000–1833/one piece depends on the size). For hospital's aspect, it would be desirable to reduce the waste generated by disposable packaging materials.
4. Suggestions: Establish the “database of instruments” to take good advantages of seldom-utilized instruments in all branches of the hospital. This can elevate the output value of the instruments and lower the purchase and related expenditures of the hospital.
5. Future Prospects: Establish the package operation by bar codes and computerize the instrument management. This can help supply center to take the control and the usage frequency and usage time of each instrument, and prepare packages in advance.