Health Care Technology Replacement Planning

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When should technology be replaced?

- When it fails at a critical time?
- When the physician returns from a conference and states the current technology is obsolete?
- When the department manager complains “my equipment never works right” at the capital budget meeting?
- When undergoing repair, it is found that parts and support are no longer available?

Need a plan for technology replacement!

Why develop technology replacement plans?

- Limited funds available
- Removes subjective and anecdotal reasons for replacement
- Guidance when major repairs are needed

Use available data on safety, user problems, reliability, support, costs, utilization, and age to develop an ongoing, replacement plan

The Ideal Technology Replacement Planning Tool

- Facility-wide, all equipment analysis
- Objective Criteria
  - Equipment management database
- Prioritized
  - Urgent, Years 1-3, Advisory
- Flexible
  - Add all quantitative and qualitative factors
- Simple to administer
Equipment Database: Device Inventory

- Type
- Manufacturer
- Model
- Serial Number
- Date of Manufacture
  - Determine from purchase records or hospital staff records
  - Manufacturer customer service
  - Sometimes, serial number

Equipment Database: Life Expectancy

- American Hospital Association
  - http://www.ahaonlinestore.com
  - Primarily financial/asset data
- U.S. Department of the Army
  - Document TB MED 7, appendix B
  - Older document based on engineering factors
- “Simple” retirement date =
  
  Manufacture date plus Life Expectancy

Equipment Database: Maintenance Factors

- No Service Support
  - Parts, repair staff, service contracts, diagnostics no longer available from the manufacturer
  - No Alternative Support
  - No service documentation or tools
- Maintenance costs
  - Accumulated > 50% new cost or increasing?
- Poor Reliability
  - Trend towards increased failures?

Computations Used

- Age factor
  - Current year – Manufacturer date
  - Life expectancy
- Reliability
  - Number of failures
  - Average number for equipment type/class
- Maintenance costs
  - Maintenance cost
  - Purchase or replacement cost
Equipment Database: Safety Factors

- Equipment-related incidents
- Recalls
  - Serious or unresolved
- User problems
  - User errors, no problem found...
- Regulatory prohibition
- Lack of essential safety features

Equipment Database: Other Factors

- Device function/risk
- Standardization
- Strategic Technology Plan
- Standards of Care
- Technology status
  - Emerging, Contemporary, Obsolete
- Utilization
- Cost advantages of new technology
  - Consumable use, patient throughput, staff productivity...

Weighting Replacement Factors

<table>
<thead>
<tr>
<th>Heavy Weight</th>
<th>Moderate Weight</th>
<th>Lesser Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unresolved safety issues</td>
<td>Opportunity for income</td>
<td>Anecdotal User Problems</td>
</tr>
<tr>
<td>No Parts</td>
<td>Documented Poor Reliability</td>
<td>Age</td>
</tr>
<tr>
<td>Regulatory Prohibition</td>
<td>Does Not Meet Standard of Care</td>
<td>More advanced technology available</td>
</tr>
</tbody>
</table>

Example Weighting System for Equipment Replacement Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value Assessment</th>
<th>Range</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unresolved safety issue</td>
<td>Expert evaluation</td>
<td>0-3</td>
<td>5</td>
</tr>
<tr>
<td>Support not available</td>
<td>Expert evaluation or in database</td>
<td>Absolute</td>
<td></td>
</tr>
<tr>
<td>Regulatory Prohibition</td>
<td>Expert evaluation</td>
<td>Absolute</td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
<td>Database analysis</td>
<td>0-3</td>
<td>4</td>
</tr>
<tr>
<td>Standard of care</td>
<td>Expert evaluation</td>
<td>0 or 3</td>
<td>3</td>
</tr>
<tr>
<td>Maintenance cost</td>
<td>Database analysis</td>
<td>0-3</td>
<td>3</td>
</tr>
<tr>
<td>Age</td>
<td>Database analysis</td>
<td>0-3</td>
<td>2</td>
</tr>
<tr>
<td>Standardization</td>
<td>Database analysis</td>
<td>0 or 3</td>
<td>2</td>
</tr>
</tbody>
</table>
**Evaluation of Database and Qualitative factors**

- Put in Equipment Replacement Cost
  - Direct, upgrade or new technology
  - Contact manufacturer, ECRI, etc. for cost
- Review and analyze each inventory item
  - Compute values according to algorithms and determine total score based on weights and category score
  - Add expert input
- Generate draft list
  - Base list cut off on budget allocated to technology replacement – replacement costs equal SX

**Prioritizing Replacement**

- Urgent - immediate
- Priority 1 - following fiscal year
- Priority 2 - “
- Priority 3 - “
- Advisory
  - Product line changes, published end of support, regulatory (e.g. medical telemetry)

**Technology Replacement Report**

- Include options to direct replacement
  - Use in less critical application, do not replace - not needed, change in technology
  - Options for disposal
- Provide to department managers prior to their budget submission or to capital equipment committee after “wish list” received
- Include replacement status in equipment management database
- Repair/ Replace decisions
Completing the Technology Replacement Process

- Report serves as an objective starting point for replacement decisions
- Combine with non-technical factors and hospital budget limitations to come up with a rational plan for replacement
- Ongoing use of report data to make repair-replace decisions and other technology changes driven by external factors