Reducing requisition-to-specimen container mismatching

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Toronto East General Hospital

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Consequences of specimen mismatching errors in the Operating Room (OR)

• Approximately 70% of defective specimen errors at Toronto East General Hospital occur when requisitions are inaccurately matched to specimen containers
  • Of particular concern in OR where samples cannot often be recollected

• Requisition and specimen arrive at lab separately hindering processing efficiency and disrupting workflow
Aims and goals

• Reduce Operating Room (OR) requisition-to-specimen container mismatching by >50% over two PDSA cycles
  • From December 2013-April 2014

• Develop a spreadsheet to track defective specimen errors

• Improve workflow of staff involved in specimen collection and processing by standardizing the specimen preparation and delivery system
Project Accomplishments

1. **Team charter**
   - Met with nurses, lab staff and the Toronto East General Hospital Quality Improvement team to develop a project charter

2. **Operating Room observations**
   - Followed collection and transport of specimen from OR to lab

3. **Process mapping**
   - Prepared a process map based on student observations
   - Collaborated with OR staff to create a nursing process map
   - Analyzed discrepancies between process maps

4. **Cause and Effect Diagram**
   - Route cause analysis of defective specimen errors

5. **Defective Specimen Error Spreadsheet**
   - Developed a defective specimen error tracking tool to be used by lab staff

6. **OR Specimen Working Group**
   - Met weekly with OR, lab and portering staff to strategize on potential solutions to defective specimen errors

7. **PDSA cycles**
   - Completed two PDSA cycles
1. Specimen obtained
2. Surgeon identifies specimen type, s-nurse takes note on cloth or table
3. Surgeon mentions where specimen is going, nurse confirms location
4. Specimen jar obtained by c-nurse (from sub-sterile room)
5a. Specimen placed in container
5b. Documentation of specimen entered into computer by c-nurse (in room)
6. Specimen jar labeled with electronic sticker
7. Requisition printed and collected from sub-sterile room
8. Specimen in labeled jar is matched with requisition form
9. Specimen and requisition form placed on trolley by c-nurse
10. Trolley transferred to hallway by nursing attendant
11. Nursing attendant takes trolley from hallway to soiled utility room
12. Specimen jar and requisition are transferred to sample holding area
13. Nursing attendant records number of sample in log book
14. Jar and requisition separated by nursing attendant
15. Porter takes jar and requisition to the lab (some porters drop specimens to specific areas within the lab)
1. Specimen obtained
2. S-nurse identifies specimen type
3. S-nurse relays specimen name to c-nurse
4. Documentation of specimen entered into computer by c-nurse (in room)
5. Specimen jar obtained by c-nurse (from sub-sterile room)
6. Specimen placed in container
7. Specimen jar labeled with electronic sticker
8. Requisition printed and collected from sub-sterile room
9. Specimen placed on trolley by c-nurse in basket on lowest shelf
10. Nursing attendant takes trolley to soiled utility room, checks if label is affixed to jar
11. Specimen jar and requisition are transferred to sample holding area
12. Nursing attendant records number of sample in log book
13. Jar and requisition separated by nursing attendant
14. Porter takes jar and requisition to the lab (some porters drop specimens to specific areas within the lab)
Differences between process maps

1. Specimen obtained
2. S-nurse identifies specimen type
3. S-nurse relays specimen name to c-nurse
4. Documentation of specimen entered into computer by c-nurse (in room)
5. Specimen jar obtained by c-nurse (from sub-sterile room)

Surgeon identifies specimen type
Surgeon mentions where specimen is going, nurse confirms location

6. Specimen placed in container
7. Specimen jar labeled with electronic sticker
8. Requisition printed and collected from sub-sterile room
9. Specimen placed on trolley by c-nurse in basket on lowest shelf

Specimen and requisition form placed on trolley by c-nurse
Specimen in labeled jar is matched with requisition form
Trolley transferred to hallway by nursing attendant

10. Nursing attendant takes trolley from hallway to soiled utility room, checks if label is affixed to jar
11. Specimen jar and requisition are transferred to sample holding area
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13. Jar and requisition separated by nursing attendant
14. Porter takes jar and requisition to the lab (some porters drop specimens to specific areas within the lab)
Cause and Effect Diagram
## Defective Specimen Error Tracking Spreadsheet

<table>
<thead>
<tr>
<th></th>
<th>File ID</th>
<th>Date</th>
<th>Level</th>
<th>Incident Type</th>
<th>Notes</th>
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<tbody>
<tr>
<td>11</td>
<td>15522</td>
<td>Jan 20</td>
<td>5</td>
<td>Leak</td>
<td>Re-labelled</td>
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<tr>
<td>12</td>
<td>18445</td>
<td>Jul 18</td>
<td>5</td>
<td>Improper Label</td>
<td></td>
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<tr>
<td>13</td>
<td>18215</td>
<td>Jul 6</td>
<td>5</td>
<td>Incorrect Requisition</td>
<td>Time was wrong</td>
</tr>
<tr>
<td>14</td>
<td>17803</td>
<td>Jun 11</td>
<td>5</td>
<td>Improper Label</td>
<td></td>
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<tr>
<td>15</td>
<td>17848</td>
<td>Jun 12</td>
<td>4</td>
<td>Incorrect Requisition</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>17699</td>
<td>Jun 4</td>
<td>5</td>
<td>No Requisition</td>
<td>Tissue was unlabelled and had no requisition</td>
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<tr>
<td>17</td>
<td>16408</td>
<td>Mar 20</td>
<td>4</td>
<td>Late Arrival</td>
<td></td>
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<tr>
<td>18</td>
<td>16531</td>
<td>Mar 26</td>
<td>3</td>
<td>Late Arrival</td>
<td></td>
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<tr>
<td>19</td>
<td>16583</td>
<td>Mar 28</td>
<td>5</td>
<td>Incorrect Requisition</td>
<td></td>
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<tr>
<td>20</td>
<td>17369</td>
<td>May 14</td>
<td>4</td>
<td>No Specimen</td>
<td></td>
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<tr>
<td>21</td>
<td>17397</td>
<td>May 15</td>
<td>5</td>
<td>Improper Preparation of Specimen</td>
<td></td>
</tr>
<tr>
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<td>17418</td>
<td>May 16</td>
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<td>Incorrect Requisition</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>17175</td>
<td>May 2</td>
<td>4</td>
<td>No Specimen</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>17522</td>
<td>May 22</td>
<td>5</td>
<td>Incorrect Requisition</td>
<td>One specimen was not added to the requisition (problem fixed)</td>
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<tr>
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<td>17606</td>
<td>May 28</td>
<td>4</td>
<td>Improper Specimen</td>
<td>Improper requisition</td>
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<tr>
<td>27</td>
<td>17269</td>
<td>May 8</td>
<td>3</td>
<td>No Specimen</td>
<td>No specimen/requisition/results even though the biopsy was performed</td>
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<tr>
<td>28</td>
<td>20457</td>
<td>Nov 22</td>
<td>5</td>
<td>Improper Label</td>
<td></td>
</tr>
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</table>
Types of errors encountered in the transport and collection of defective specimen (Jan 2013 – Mar 2014)
Defective Specimen Error Run Chart (Jan 2013 – Mar 2014)
Potential route cause of requisition mismatches:

Separation of requisition from specimen container in soiled utility room

- Specimen container matched with requisition in OR
- Transferred to soiled utility room and separated
- Specimen and requisition re-matched by porter
- Transported to lab
PDSA Cycles

1. Test of change run in OB/GYN Operating Rooms
2. Specimen placed in plastic bag by Circulating Nurse
3. Requisition folded with patient information facing out and placed in outer slot of plastic bag
4. Plastic bag transferred to soiled utility room for porter pick-up

PDSA challenges:
- Requisition folded incorrectly
- Low compliance with filling out qualitative questionnaire
- Inconsistent data collection
Defective Specimen Error Run Chart (April 2014)

PDSA #1: OR Specimen-to-Requisition Matching through Plastic Bag Preparation

<table>
<thead>
<tr>
<th>Date</th>
<th>Number of Specimen Prepped in Bag</th>
<th>Number of Specimen not Prepped in Bag</th>
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<td>0</td>
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<tr>
<td>April-03-14</td>
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<td>13</td>
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<tr>
<td>April-04-14</td>
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<td>11</td>
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<table>
<thead>
<tr>
<th>Date</th>
<th>Number of Specimen Prepped in Bag</th>
<th>Number of Specimen not Prepped in Bag</th>
</tr>
</thead>
<tbody>
<tr>
<td>April-09-14</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>April-10-14</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>April-11-14</td>
<td>2</td>
<td>11</td>
</tr>
</tbody>
</table>
Key Overall Learning's

• Relationship building improves frontline staff buy-in
  • Formation of a multidisciplinary working group that includes physicians is key to developing potential solutions
  • Hard to limit working group focus----OR staff wanted to change many things

• Regular meetings with executive and key stakeholders helps to re-identify accountabilities

• Choose data collection tools wisely
  • Accurate data is difficult to obtain
  • Need staff to see its value
  • Staff engagement challenged by competing priorities (e.g. other projects, workload)

• Need to be available to support staff during PDSA cycles
Next Steps

- PDSA #3: Plastic bagging preparation to be tested in Urology Operating Rooms
- PDSA #4: Coloured bin matching
  - Successful implementation of bin system in TEGH Out Patient Department