You CAN always get what you want; streamlining the evidence retrieval process.
Project Team

Jordan Green – Team Leader
Byron Smith – Communications Coordinator
Catharine Worthen – Team Member
Kimberly Lee – Team Member
The current evidence retrieval process lacks consistent timeliness in delivery. Scientists wait an average of $11 \pm 12$ working hours before their requested evidence is available to work. With such a large variation in wait times, the existing process stymies efforts to improve productivity and reduce the backlog of exams.
Customer Requests Lab Examination

Exam Request Assigned to Forensic Analyst

Evidence Custodian Orders Evidence from Property Room Using TRACIS

Analyst Creates Evidence Batch in LIMS & Emails Evidence Custodian

Evidence Custodian Prints Lab Evidence Labels

Property Room Evidence Tech Opens & Prints Evidence Order

Tech Pulls Evidence from Storage Location

Tech Scans Evidence & Updates Order Status
Evidence Custodian
Monitors TRACIS & Observes Order is Complete

Evidence Custodian Brings Evidence to Forensic Lab

Evidence Custodian Places Lab Labels on Evidence

Evidence Custodian Goes to Property Room to Receive Order

Evidence Tech Assists Evidence Custodian With Custody Transfer

Evidence Custodian Transfers Evidence to Section-Specific Storage Location

Evidence Custodian Notifies Analyst Evidence Is Available to Work
Tools Utilized

- Gemba – “the actual place”
- Surveys to customers and property room personnel
- Process map
Root Cause Analysis

- Interviews with personnel to identify bottlenecks
- Analysis of historical data using laboratory information management system and TRACIS
  - Identification of major outliers and reasoning behind them
  - Identification of time gaps or “problem sections”
- Go to the “Gemba” to understand the current evidence process
Survey Provided to Laboratory Analysts

Do you often wait for evidence to arrive?

45% of analysts wait for their evidence
Survey Provided to Laboratory Analysts

What is an acceptable wait time (in work days) from when evidence is requested until the evidence is available to work?

Most analysts believe 1-2 days is an appropriate wait time.
For the following, please rate how convenient it is to retrieve evidence:

<table>
<thead>
<tr>
<th>Retrieve evidence in the morning (8:00 A.M.-10:00 A.M.)</th>
<th>VERY INCONVENIENT</th>
<th>SOMEWHAT INCONVENIENT</th>
<th>NEITHER CONVENIENT OR INCONVENIENT</th>
<th>SOMEWHAT CONVENIENT</th>
<th>VERY CONVENIENT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrieve evidence in the morning (10:30 A.M.-11:30 A.M.)</td>
<td>0.00%</td>
<td>28.57%</td>
<td>28.57%</td>
<td>28.57%</td>
<td>14.29%</td>
<td>7</td>
</tr>
<tr>
<td>Retrieve evidence in the afternoon (12:30 P.M.-3:30 P.M.)</td>
<td>0.00%</td>
<td>14.29%</td>
<td>0.00%</td>
<td>71.43%</td>
<td>14.29%</td>
<td>7</td>
</tr>
<tr>
<td>Retrieve small sized batches (Less than 25 items per batch)</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>25.00%</td>
<td>75.00%</td>
<td>8</td>
</tr>
<tr>
<td>Retrieve medium sized batches (25-50 items per batch)</td>
<td>0.00%</td>
<td>25.00%</td>
<td>12.50%</td>
<td>37.50%</td>
<td>25.00%</td>
<td>8</td>
</tr>
<tr>
<td>Retrieve large sized batches (greater than 50 items per batch)</td>
<td>14.29%</td>
<td>57.14%</td>
<td>0.00%</td>
<td>14.29%</td>
<td>14.29%</td>
<td>7</td>
</tr>
</tbody>
</table>
Of the following, which scenario is the most convenient?

Evidence technicians prefer two or three evidence orders of 50 or less items per week.
Survey Provided to Evidence Technicians

Which days are especially busy?

Mondays are the WORST
Root Cause Analysis

- Interviews with personnel to identify bottlenecks

- Analysis of historical data using laboratory information management system and TRACIS
  - Identification of major outliers and reasoning behind them
  - Identification of time gaps or “problem sections”

- Go to the “Gemba” to understand the current evidence process
Root Cause Analysis

We collected evidence order creation and retrieval information dating February 20, 2018 to March 16, 2018 in order to:

• Determine current time intervals

• Identify any trends

• Define the evidence retrieval demographics
Root Cause Analysis

Time Spent Waiting for Evidence per Section

Elapsed Time in Work Hours

- Firearms
- DNA
- Drugs
- Serology
- Latent Prints
- Toxicology
Evidence Order Size as a Function of Time

- Number of Items in Evidence Order
- Elapsed Time (in Work Hours)

The diagram shows a scatter plot with points indicating evidence order size over time. The x-axis represents elapsed time (in work hours) ranging from 0 to 60, and the y-axis represents the number of items in the evidence order ranging from 0 to 40. The data points are plotted, but specific values are not provided in the image.
Evidence order process taking over 8 work hours is considered a defect

<table>
<thead>
<tr>
<th>Sigma Level</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Defects</td>
<td>57.14%</td>
</tr>
<tr>
<td>Yield</td>
<td>42.86%</td>
</tr>
<tr>
<td>DPMO</td>
<td>571,429</td>
</tr>
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</table>
Root Cause Analysis

- Interviews with personnel to identify bottlenecks

- Analysis of historical data using laboratory information management system and TRACIS
  - Identification of major outliers and reasoning behind them
  - Identification of time gaps or “problem sections”

- Go to the “Gemba” to understand the current evidence process
Root Cause Analysis

The team followed evidence from evidence order creation to delivery into storage lockers in order to:

- Find any obvious hiccups in the process
- Understand the process from the eyes of property room personnel
- See if there are any undetected redundant or unnecessary steps in the process
Root Cause Analysis

Time spent during the steps of evidence retrieval after ten operator analyses:

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<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td>1-36 Items</td>
<td>1-12 Minutes</td>
<td>1-30 Minutes</td>
<td>11-77 Minutes</td>
<td>1-919 Minutes</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>14 Items</td>
<td>5 Minutes</td>
<td>13 Minutes</td>
<td>51 Minutes</td>
<td>172 Minutes</td>
</tr>
</tbody>
</table>
The **root cause** was identified to be lack of coordination between the Forensic Laboratory and the Property Room, which led to a lack of structure in the evidence retrieval process.
The laboratory conducted a month long pilot study to measure the efficacy of changes to the evidence retrieval process. The changes included:

- Developing a schedule for evidence ordering
- Adjusting the barcoding system for evidence by removing laboratory specific barcodes
- Limiting the quantity of items in each evidence order to 30 items or less
A schedule is now followed to pull evidence by the Property Room and retrieve evidence by Laboratory evidence custodians.

**Our pull times will be as follows (M-F):**

0800-0830 (or later if needed until completion)

1230-1300 (or later if needed until completion)

**Person responsible:** the person assigned to the pager (on-call) will ensure that the picklists are printed and pulled each day of that week. This means the on-call officer will come in to the office instead of picking up their property at their division. If an emergency arises (manning levels or otherwise), the on-call officer must notify the supervisor as well as contact the laboratory to let them know their picklists will be pulled in the second pull or morning pull, whichever one is appropriate.

**Lab retrieval of evidence will begin as follows (M-F):**

1000

1400
Laboratory personnel were trained to create item orders using a different barcoding schema. This reduced waste by eliminating the need for lab labels.
Evidence orders were limited to 30 items or less.
New Process Map

Customer Requests Lab Examination

Tech Lead/Analyst Creates Evidence Order in LIMS & Emails Evidence Custodian

Exam Request Assigned to Forensic Analyst

Request for Tox or Chemistry?

Evidence is Ordered from Property Room Using TRACIS

Evidence Custodian Reviews Request and Generates Evidence Order

Before 8:00a and again before 12:00p
At around 8:30a and again at 12:30p

- Property Room
- Evidence Tech Opens & Prints Evidence Order

At around 10:00a and again at 2:00p

- Evidence Custodian Receives Order in Property Room

Evidence Custodian Transfers Evidence to Section-Specific Storage Location

- Evidence Custodian Transfers Evidence to Personal Custody

Tech Pulls Evidence from Storage Location

Tech Scans Evidence & Updates Order Status
Ranges of Wait Times per Section

<table>
<thead>
<tr>
<th>Section</th>
<th>Wait Time (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>4</td>
</tr>
<tr>
<td>Toxicology</td>
<td>6</td>
</tr>
<tr>
<td>Chemistry</td>
<td>8</td>
</tr>
<tr>
<td>Firearms</td>
<td>10</td>
</tr>
<tr>
<td>Latent Prints</td>
<td>12</td>
</tr>
</tbody>
</table>
Average Wait Time per Section

- Biology: 2.50 hours
- Toxicology: 3.50 hours
- Chemistry: 4.00 hours
- Firearms: 3.90 hours
- Latent Prints: 2.20 hours
Evidence order process taking over 8 work hours is considered a defect

<table>
<thead>
<tr>
<th>Sigma Level</th>
<th>3.00</th>
</tr>
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<tbody>
<tr>
<td>Defects</td>
<td>7%</td>
</tr>
<tr>
<td>Yield</td>
<td>93%</td>
</tr>
<tr>
<td>DPMO</td>
<td>69,767</td>
</tr>
</tbody>
</table>
Next Steps in the Project…

• Use a second survey to measure stakeholder satisfaction of changes tested in the pilot study

• Recommend changes for permanent implementation based on outcome of pilot study

• Investigate further into why the defects and outliers involved the Chemistry section