Sample Labeling

OZUMBA PETRONILLA JEAN
(H3A Biorepository PI Committee)
• Introduction
• Labeling Methods
• Advantages & Disadvantages
• Choosing Labels
• Creating & Using Labels
• Future options
• Conclusion
• Correct labeling of specimens is vital for translational or clinical studies, linking clinical data with bio specimens.
• While patient privacy must be protected, confusing or inadequate labeling can potentially result in the study of wrong bio specimens with detrimental effects to the accuracy of published findings or a requirement for invaluable bio specimens to be discarded.
Specimen Labeling Guide

• Every individual tube, container, specimen must be labeled/correctly.
• Label elements must be clearly defined
• Use a minimum of 2 unique identifiers to track specimen
• Link to parent sample.
• Ample space for elements
• Validate labels to ensure quality given anticipated environment
Labeling Methods

Hand written label
- Cryogenic labels
- Cryomarkers
- Waterproof/solvent markers

Electronic label
- Cryogenic labels (Word & Laser/inkjet)
- Barcode labels
Barcode Types?

- Linear, one-dimensional (1D) barcodes are based on bars and spaces, such as on Universal Product Code (UPC);

- Newer, two-dimensional (2D) barcodes are based on "dot" locations within a matrix, such as data matrix and Aztec codes;
## Handwritten vs. Electronic

<table>
<thead>
<tr>
<th>Handwritten label</th>
<th>Electronic label</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Hands on time</td>
<td>&lt; Hands on time</td>
</tr>
<tr>
<td>&gt; Risk of errors</td>
<td>&lt; Risk of errors</td>
</tr>
<tr>
<td>Quality varies</td>
<td>Standard quality</td>
</tr>
<tr>
<td>Cheap</td>
<td>&lt; Hands on time</td>
</tr>
<tr>
<td>Easily accessible</td>
<td>&lt; Risk of errors</td>
</tr>
<tr>
<td>&lt; resources</td>
<td>Standard quality</td>
</tr>
</tbody>
</table>

- More expensive
- Less accessible
- Requires > resources
Choosing Labels

- Expertise
- Hardware
- Software
- Costs
- Compatibility
- Environmental Conditions
Creating Labels I:

1. Consult package insert for template
2. Design/configure Label
3. Save Label
4. Print test page
5. Adjust as required
6. Print labels

E.g. Cryotags (Cryobaby)
Creating Labels II:

- Design label within software.
- Select samples to print labels for (usually via search option).
- Select desired label configuration from list.
- Print desired # labels per sample.

**E.g.** Laboratory Information Management System (LIMS)
Configuring Labels In Freezerworks: I
Configuring Labels In Freezerworks: II
Applying Labels

- Arrange samples & labels in same order
- Crosscheck ID against parent tube
- Neatly & carefully apply
- Minimize bubbles
- Do not allow to hang off tube
- Do not cover elements of label
- Adhere firmly to tube
Sample Labeling – Current Practice

- Handwritten label using markers??
- Use of Cryogenic labels??
- Use of Barcode Labels??
**General Principles:**

- Standardized barcoding system that is administered centrally
  - Unique sample identification
  - Tracking option
- Flexibility to accommodate research sites at different levels of IT support / sophistication.
- Incorporates the Standard Pre-analytical code (SPREC) for bio specimens in addition to unique identifiers.
- QC
Future Option - Sample Barcode Labels-II

- Unique Site Identification
- Unique Sample Identification
- Quick reference for area of origin (East Africa, West Africa etc.)
- Pre-analytical sample information (SPREC coding)
- 1D/2D Scannable barcode
- Important to include human-readable indications of contents.
- Label with at least 2 human-readable forms of identification on them
Future Option - Sample Barcode Labels-III

Site Prefix: AAB
Area Designation: S
Unique Specimen ID: 199887 7
Same Patient Identifier: SER-PPT-A-C-N-A-A

Standard Pre-analytical code (SPREC)
• Onsite barcode generation
• Online, Cloud-based engine for barcode generation & distribution
In Conclusion

- The concept is to establish consistency in label content, format etc.
- Use of barcoding system has been identified as best practice for reducing specimen identification errors (CDC, 2011)
- Adoption of this standard by all, will contribute to a reduction in specimen labeling errors.
Acknowledgement

- I-HAB Team
- CLS
- NSB
- IBH3AU
- Bio repository PI commitee
- NIH
- SC working group