Electronic Identification and Tracking Systems for the Management of Human Laboratory Samples and Donations: Clinical Effectiveness, Cost Effectiveness, and Guidelines
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Acknowledgments:

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About CADTH: CADTH is an independent, not-for-profit organization responsible for providing Canada’s health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs, medical devices, diagnostics, and procedures in our health care system.
**Research Questions**

1. What is the clinical effectiveness of electronic tracking and identification technologies for the management of human laboratory samples and donations?

2. What is the cost-effectiveness of electronic tracking and identification technologies for the management of human laboratory samples and donations?

3. What are the evidence-based guidelines regarding the use of electronic tracking and identification technologies for the management of human laboratory samples and donations?

**Key Findings**

One systematic review and three non-randomized studies were identified regarding the clinical effectiveness of electronic tracking and identification technologies for the management of human laboratory samples and donations.

**Methods**

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2017, Issue 3), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic studies and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2012 and March 2, 2017. Internet links were provided, where available.

**Selection Criteria**

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

<table>
<thead>
<tr>
<th>Population</th>
<th>Patients in the health care setting (including acute and long-term care)</th>
</tr>
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<tbody>
<tr>
<td>Intervention</td>
<td>Electronic tracking and identification technologies (i.e., 1D and 2D barcoding, radiofrequency identification technology, real-time location systems) used for management of human laboratory specimens and donations</td>
</tr>
<tr>
<td></td>
<td>- Identity verification and tracking of patient samples for screening or diagnosis (e.g., blood samples, pathology specimens)</td>
</tr>
<tr>
<td></td>
<td>- Verification (identity, duration, characteristics) and tracking of donated products (e.g., blood products, breast milk, donated tissue)</td>
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Table 1: Selection Criteria

<table>
<thead>
<tr>
<th>Comparator</th>
<th>Q1 and Q2: Alternative electronic patient identification systems; Manual tracking or identification methods; No tracking or identification method</th>
<th>Q3: No comparator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcomes</td>
<td>Q1: Clinical effectiveness (e.g., prevention of treatment errors, improved clinical outcomes, reduced time to treatment, length of stay, re-hospitalization rate, ICU admissions, quality of life, mortality [overall and treatment related]); Harms (e.g., increased time to treatment due to technical errors)</td>
<td>Q2: Cost-effectiveness outcomes (e.g., cost per quality-adjusted life year, cost per health benefit gained)</td>
</tr>
<tr>
<td>Study Designs</td>
<td>Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines</td>
<td></td>
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</tbody>
</table>

Results
Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, economic evaluations, and evidence-based guidelines.

One systematic review and three non-randomized studies were identified regarding the clinical effectiveness of electronic tracking and identification technologies for the management of human laboratory samples and donations. No relevant health technology assessments, randomized controlled trials, economic evaluations, or evidence-based guidelines were identified.

Additional references of potential interest are provided in the appendix.

Health Technology Assessments
No literature was identified.

Systematic Reviews and Meta-analyses
Randomized Controlled Trials
No literature was identified.

Non-Randomized Studies
PubMed: PM27494020

PubMed: PM25594877

PubMed: PM23541010

Economic Evaluations
No literature was identified.

Guidelines and Recommendations
No literature was identified.
Appendix — Further Information

Systematic Review – Unclear Interventions

Non-Randomized Studies

No Comparator


No Patient Outcomes


Review Articles


Additional References


