CENTER FOR HEALTHCARE ENGINEERING & PATIENT SAFETY
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Replacement and Separation of Kerrisons to Reduce Bioburden

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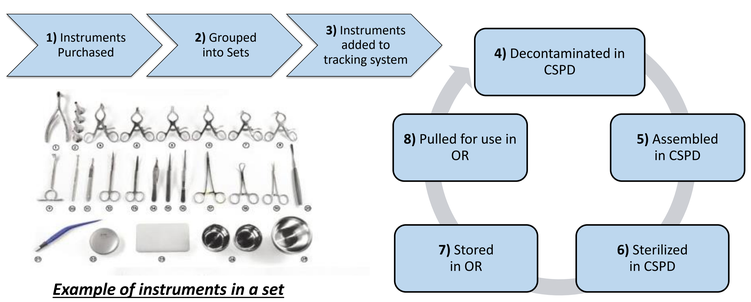
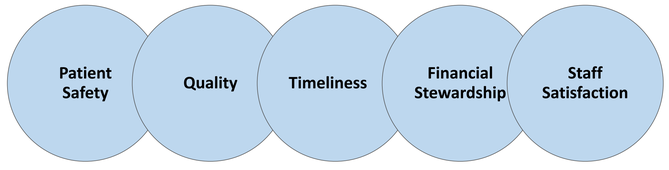
Background



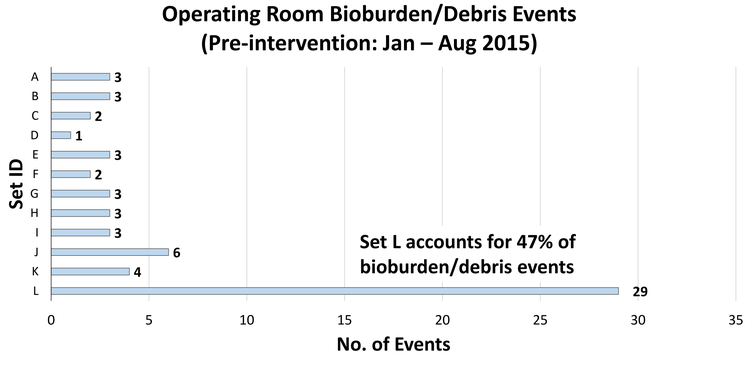
Example of instruments in a set

- **Efficient** instrument reprocessing is a critical challenge nationwide
- Meeting reprocessing standards requires complex coordination of multiple hospital **functions**, **resources**, and **stakeholders**
- Michigan Medicine conducted **51,583 cases** and reprocessed **~15,000 items/day** in FY14
- Insufficiently cleaned instruments containing bioburden or debris negatively impact institutional outcome measures, most notably **patient safety**



Problem Statement

- OR Staff reported frequent problems related to the reprocessing and delivery of surgical instruments
- 51% of problems reported were due to bioburden/debris

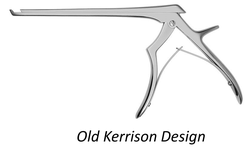


Solution Approach

Key Topics	Scoping Questions
Defining and Preparing New Instrument Sets	1. How many sets and storage trays should be purchased? 2. What will each of them contain? 3. How will new sets be defined and barcoded? 4. How much safety stock will be required & purchased?
Storage	1. Where will new items be kept? 2. How will they be accessed and tracked?
Logistics	1. What will the new workflow be for CSPD runners? 2. What will the new workflow be for RN scrubs? 3. What will the new workflow be for surgeons? 4. When will the items be ordered/delivered/ready for use? 5. When will we begin the pilot?
Metrics	1. How do we evaluate success?

1. Conducted observations of perioperative instrument flow
2. Analyzed historical set-level bioburden/debris event data
3. Identified Set L as difficult to clean
4. Identified Kerrison rongeurs as instrument most likely to cause bioburden/debris events in Set L via instrument-level analysis and staff interviews:
   - ❑ *Hypothesis 1*: Separating high- from low-risk instruments improves reprocessing outcomes
   - ❑ *Hypothesis 2*: Instrument design features impact cleanability
5. Proposed a two-part intervention to:
   - ❑ Separate existing Kerrison rongeurs from the rest of Set L
   - ❑ Replace the Kerrison rongeurs with new, easier-to-clean Kerrisons

Instrument Feature	Old Kerrisons	New Kerrisons
Blades	Partially Accessible	Accessible
Channel	Inaccessible	Accessible
Grooved components	Inaccessible	Accessible
Jaws/Hinge	Inaccessible	Accessible



Old Kerrison Design

New Kerrison Design

6. Conducted cost-benefit analysis of the proposed interventions

Set Level Cost Summary	Expected Benefit
Total Reprocessing cost avoided in CSPD (average per month)	$144.48
Total OR time costs avoided per year (assuming 5 min delay per event)	$27,490
Total OR time costs avoided per year (assuming 30 min delay per event)	$236,290

7. Implemented pilot study and tracked bioburden/debris event data post-intervention

Impact/Results

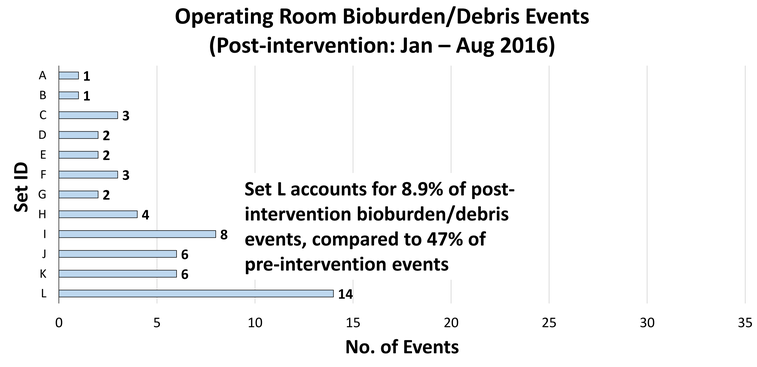
Benefits observed associated with this intervention:

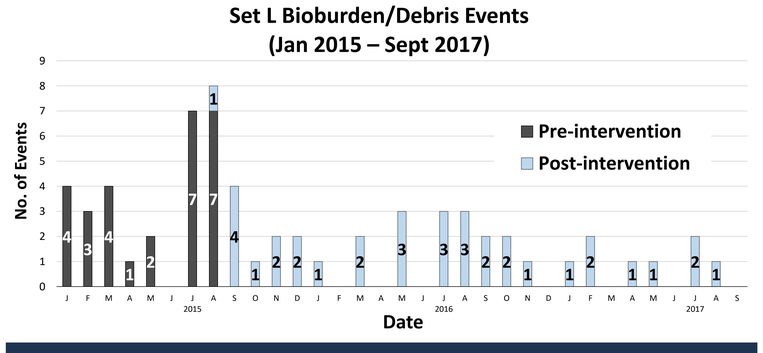
1. To date, 0 bioburden/debris events related to new Kerrison set
2. Average monthly bioburden/debris events related to Set L **decreased by 63.2% from 3.73 to 1.37**
3. OR time saved provides estimated annual savings of **$23,490 to $236,290** (based on average event delays of 5-30 min)

Applying engineering approaches to configuring sets (e.g., high-risk instrument separation) can improve quality and save money

Average Monthly Set-level Usage Summary	Set L Pre-Intervention	Set L Post-Intervention	Kerrisons Post-Intervention	Change
Uses	128	128	128	–
Sets returned due to bioburden/debris	3.73	1.37	0	-2.36
Instruments returned due to bioburden/debris	458.79	168.51	0	-290.28
Reprocessing cost due to bioburden/debris*	$248.53	$91.28	0	-$157.25

* Includes labor, equipment, and maintenance costs





Acknowledgements

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