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Sustainable Incident Management in Medical Imaging through Structured Review

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Declaration of Conflict of Interest

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- *No other relationships with commercial interests exist*

Authors and Contributors

Authors:

- Ava Dideban, Senior Project Analyst, *Office of Strategy Management, JDMI*
- Mackenzie Crawford, Senior Project Analyst, *Office of Strategy Management, JDMI*
- Jenny Catton, Director, *Diagnostic Performance, JDMI*

Key Contributors:

- Nicole Bennett, *Supervisor, CT at Toronto Western Hospital, JDMI*
- Antonia Cole, *Manager, Medical Imaging for Toronto Western Hospital, JDMI*
- Jason Fisico, *Supervisor, CT at Mount Sinai Hospital, JDMI*
- Timo Krings, *MD PhD FRCP(C), Chief of Diagnostic and Interventional Neuroradiology at the Toronto Western Hospital & University Health Network, JDMI*
- Jisla Mathews, *Manager, Office of Strategy Management, JDMI*
- Mahnaz Miraftabi, *CT Technologist, JDMI*
- Patrick Nicholson, *MD, Fellow, Interventional and Diagnostic Neuroradiology at Toronto Western Hospital, JDMI*

Purpose (The problem addressed)

- Addressing safety issues is contingent on identifying the **true source of the issue**
 - Often **rests further under the surface of a safety event than what an unstructured review will identify**
- Medical imaging staff are faced with a unique challenge:
 - *Supporting patients*
 - *Managing sophisticated equipment*
 - ➔ *Interfacing with healthcare professionals and teams who are unfamiliar with the processes, environment, and safety practices of the medical imaging space*
- Necessitates effective and sustainable solutions to safety events which must be arrived at **efficiently**
- JDMI employs a **structured review process**
- brings together all involved parties to perform root cause analysis to identify the true cause of a safety issue and collaboratively develop a solution aimed at addressing the root cause

Methods (Approach used to Solve the Problem)

- *Root cause analysis is a simple and systematic methodology to narrowly focus a problem to identify the true source and apply effective countermeasures to address the source*
- In JDMI, all incidents that are potentially critical or severe follow an objective and multi-step review process to:

Identify facts of the timeline;

Bring together those involved in the specific episode of care (including the treating or referring team);

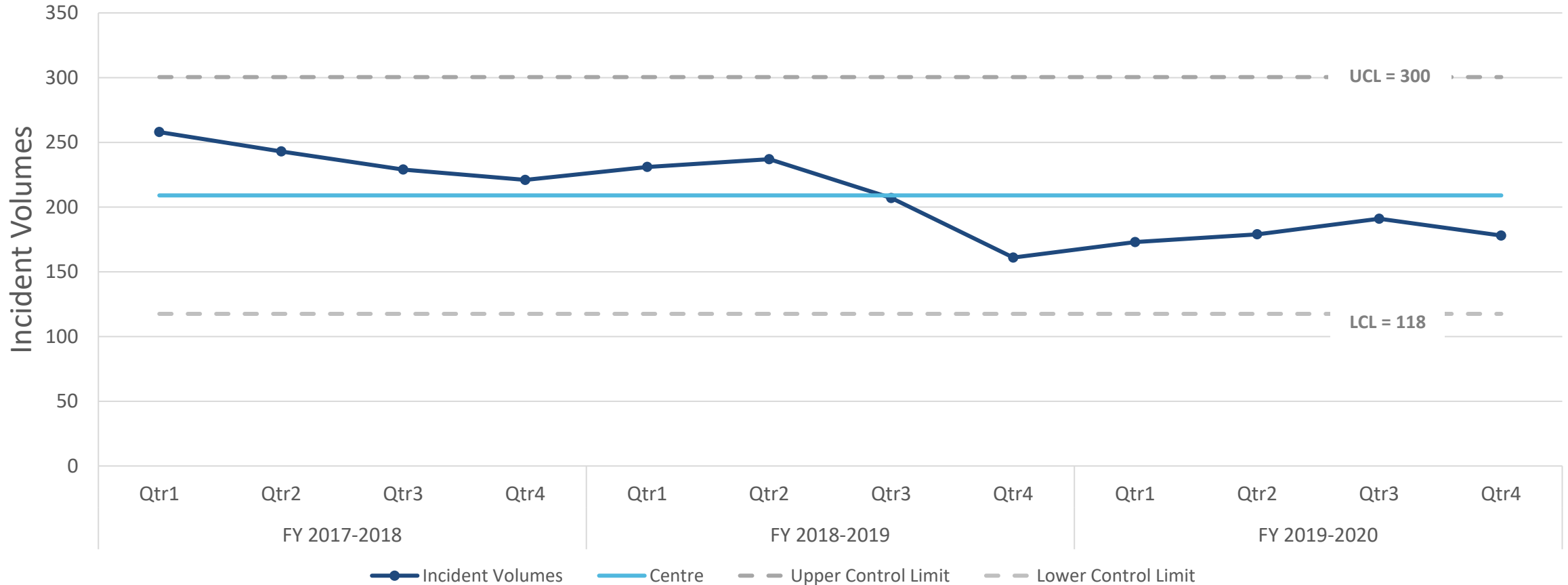
Map the relevant details; and

Identify factors that contributed to a breakdown in process by using root cause analysis (including brainstorming ways to strengthen our processes).

Results of Structured Review

- Safety events are submitted to the hospital's safety incident management system and routinely monitored.
- Volumes for the last three years (fiscal year 2017/18 to 2019/20) were analyzed using a control chart to determine the impact of this **continuous process improvement** effort to review and resolve safety events systematically using root cause analysis (please refer to figure 1).
- The commitment to the application of root cause analysis has led to consistently decreasing incident volumes across our medical imaging department. A control chart of the last three years shows an emerging trend with currently 5 consecutive points falling below the mean (Average = 209; Upper Control Limit = 300; Lower Control Limit = 118; Standard Deviation = 30). Incident volumes have decreased by 3% on average each quarter during these three years.

Figure 1: Control Chart of 3-Years' Medical Imaging Incident Volumes (2017/18 FY – 2019/20 FY)



Centre = 209	Upper Control Limit (UCL) = 300	Number of data points = 12
Standard Deviation = 30	Lower Control Limit (LCL) = 118	Potential trend = 5 consecutive points below mean

- An objective review process has the benefit of:
 - **Avoiding creation of “Band-Aid” solutions or those driven by blame or symptoms;**
 - **Encouraging collaborative troubleshooting across departments and disciplines; and**
 - **Ensuring lasting solutions that prevent future events, and more.**
- In the example safety incident, a lack of clarity surrounding when entry into the scan room is permitted as well as appropriate MRI safety practices during an emergency resulted in a delay in providing nursing support. Typical solutions to address such an issue might have included didactic education and training, increases in safety checks, and/or disciplinary action. Rather, the team completed an objective review and root cause analysis to identify ways that the process could better support staff in preventing errors.

Conclusion

- The MRI process prior to this event was that technologists would accompany patients into the MRI scan room, leaving nursing staff in the MRI control room. The root cause of this safety event was that this practice created hesitation in non-imaging staff to enter the scan room, even when their entry was requested. Through root cause analysis, this communication gap and lack of transparency on proper safety protocol was identified. The process was then collaboratively improved to enhance the direct and indirect communication between nursing and MRI staff. The nurses now play a more active role in setting the patient up in the scan room (e.g. bringing patient into the room, assisting with transfer to the scan table, etc.). This process addresses the root cause of the safety issue by ensuring that proper MRI safety protocol is clear to all, reducing the need to seek clarification and subsequent delays in care.
- While this event resulted in minimal harm to the patient, it could have had a severe impact. Setting lasting solutions in place is essential to avoid similar incidents in the future which may become severe. This example demonstrates how a minor change in practice addressing the root issue can substantially improve patient care rather than solutions that are misdirected. Improvements aimed at the root cause are more meaningful and sustainable, thus leading to steady decreases in safety events over time.