

Resident Focused Approach to Reducing MRI Adverse Events and Near Misses: A Competency-based Curriculum

Diagnostic Radiology Residency Program RIP Project 2021-2022

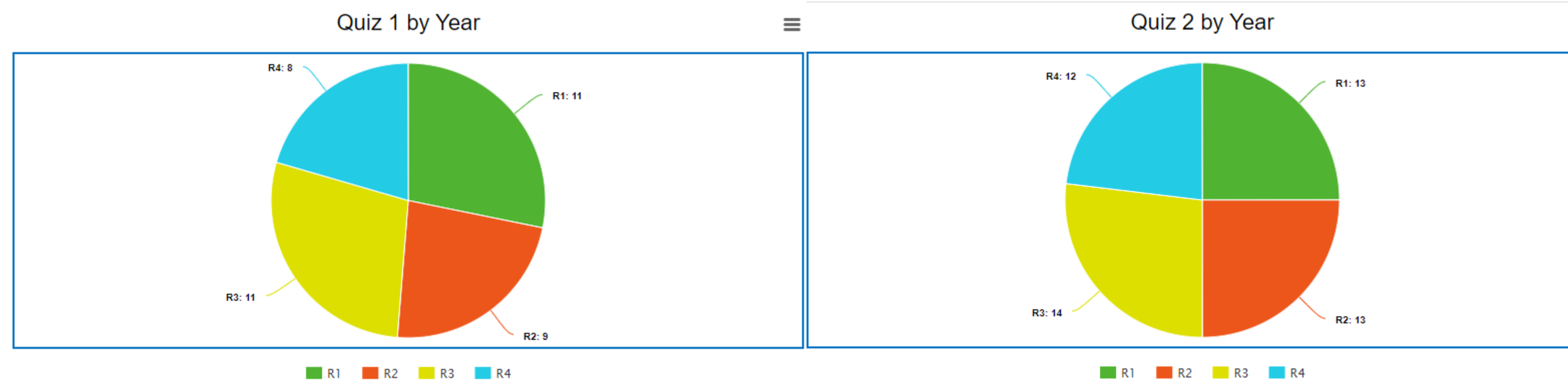
BACKGROUND

- Magnetic resonance imaging (MRI) is used daily in the healthcare setting and may be emergent.
- Performing an MRI is not without risk due to the strong electromagnetic fields, and historical landmark incidents have ranged from burns to patient demise.
- In general, MRI cannot be performed on those with certain medical devices including aneurysm clips, implants, pumps, neurostimulators, pacemakers, and other metal objects such as bullets.
- Devices may be compromised and there is also risk for burns and acoustic injuries. It is paramount to ascertain this safety information prior to performing an MRI.
- Radiologists should be aware of the full spectrum of harm that can result from MRI to ensure patient safety.

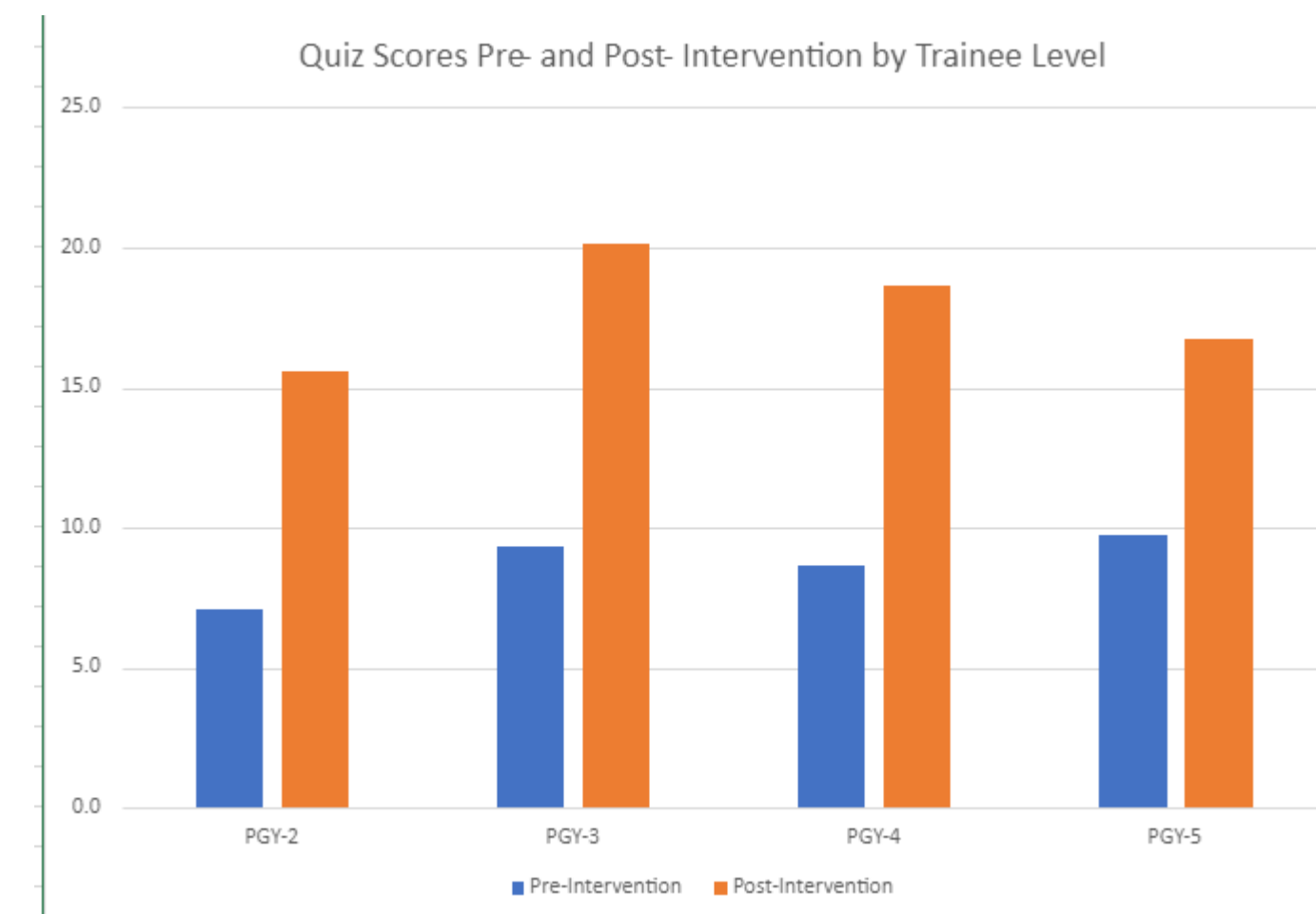
METHODS

- A curriculum was designed involving consultants, technologists, residents, and attending radiologists to determine weaknesses of resident education regarding MRI safety which may result in possible patient safety events.
- A baseline quiz was obtained from each radiology resident in October 2021. The goal was to see a 15% increase in resident scores.
- MRI safety content was presented at various lectures times by attending physicians as well as the resident quality improvement representatives. Digital MRI safety guides were also provided to residents for reference.
- A second quiz was obtained in March 2022 and analysis was performed.

RESULTS



Participation in quiz 1 and quiz 2 by year of training.



Using Welch's T-test there was a significant improvement between the pre-quiz ($M = 8.6$, $SD = 2.7$) and post-quiz scores ($M = 17.8$, $SD = 3.5$) overall $t(89) = -14$, $p < 0.01$.

Residents demonstrated a greater than 15% improvement. Overall, the average improvement in quiz score was 37%.

CONCLUSIONS

- A dedicated curriculum was effective in educating residents about a particular subject and this could be applied to other areas in the future.
- The predetermined goal was met and the residents exceeded it. Originally, the goal was 15% improvement, and the residents displayed a 37% improvement to a statistically significant degree. Barriers included a delay in administration of the first quiz but a 6 month timeline was achieved.
- In the future, MRI safety measures and education could be assessed through methods such as PSI rates and patient safety events. A more longitudinal approach could also be undertaken assessing residents over many years.

SUMMARY

- MRI safety education is important to ensure patient safety.
- A baseline was obtained from residents regarding this specific subject.
- Education on MRI safety was integrated into the residency curriculum over the course of 6 months.
- Via post test data, residents showed a statically significant amount of improvement overall regardless of level of training
- Educational intervention such as lectures and reading material can improve general knowledge in a target group.

MUSC Pillar Goal

Quality; Increased Culture of Safety

AIM

To educate residents about MRI safety practices in order to improve patient safety and promote a culture of safety within the radiology department.