

Trainee-Driven Quality Improvement Initiatives in the Musculoskeletal Imaging Section of a Tertiary Hospital

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Trainee-Driven Quality Initiatives: From Idea to Reality

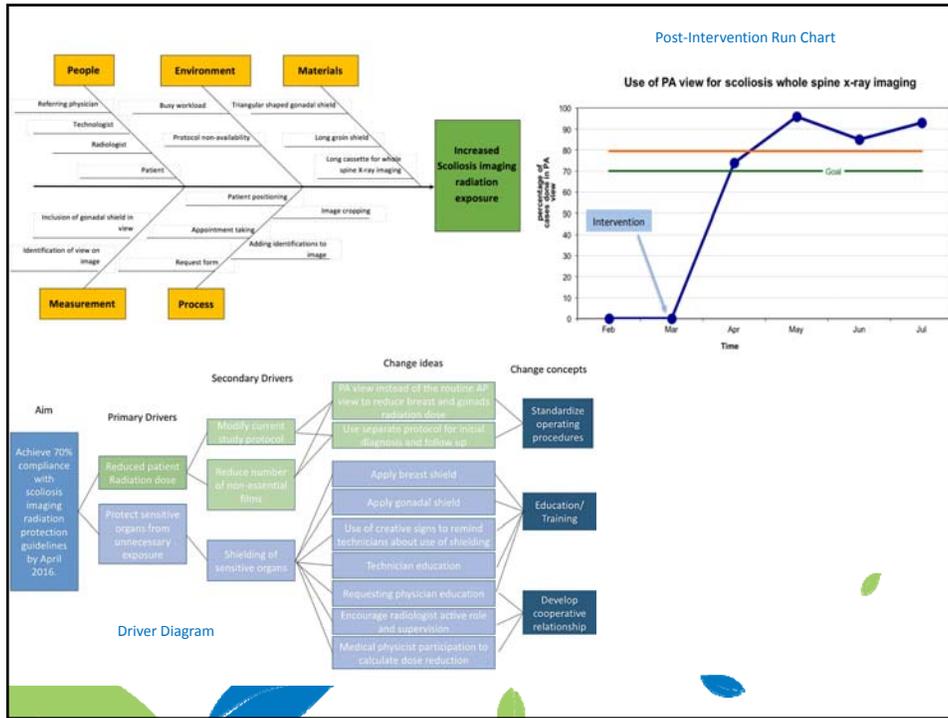
- Quality improvement projects are usually determined using a top-down approach, with a committee of senior physicians determining the direction of the quality efforts.
- The clinical imaging department in our institute, incorporated the residents and fellows in pointing out areas that could be considered targets for quality improvement, based on their experience of daily work.
- Ideas generated are presented formally as clinical audits, which are then vetted by departmental and sectional quality committees.
- Trainees then executed the approved quality improvement initiatives under direct supervision of mentors and quality improvement coaches.
- Quality tools i.e. PDSA, Driver Diagrams, Cause and effect diagrams and different outcome measures quality tools were used to create a framework for improvement and assess the impact of our changes.
- The outcomes were then determined by a second PDSA audit cycle.

Quality Improvement Projects

- This quality storyboard portrays the three most impactful quality improvement projects done in the MSK section at Hamad General Hospital, Doha, Qatar.
 - Reducing Radiation Exposure in Young Patients Undergoing Whole Spine X-ray for Scoliosis.
 - Reducing Radiation Dosage in Patients Undergoing Evaluation of the Sacroiliac Joints.
 - Standardization of Reporting MRI of the Knee Joint.

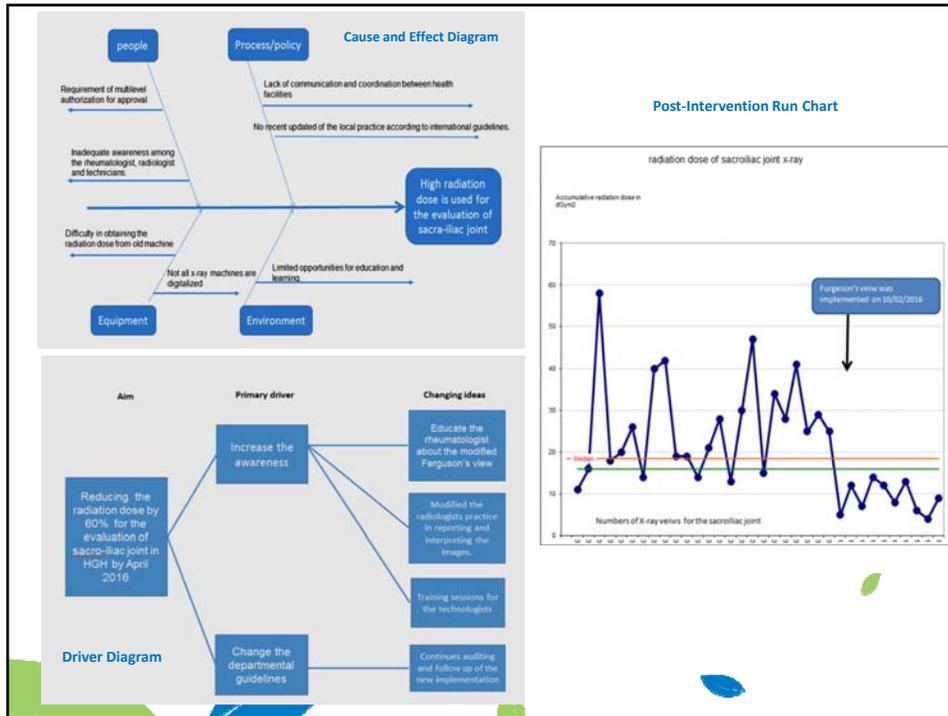
Reducing Radiation Exposure in Young Patients Undergoing Whole Spine X-ray for Scoliosis

- The compliance with the [scoliosis radiation protection guidelines](#) (includes but not limited to [ACR–SPR–SSR](#) practice parameters and [FDA](#) Reducing patient exposure during scoliosis imaging) will help provide the safest care to the patients without any compromise in the quality of care provided.
- In our organization, all scoliosis patients were scanned in the [AP view](#) instead of [PA view](#) which exposes them to excess avoidable radiation.
- In the pre-intervention PDSA, it was found that [100%](#) of the patients were imaged in the AP view. Our [goal](#) was to increase usage of the [PA projection](#) for scoliosis diagnosis and follow up protocol to [>70%](#), by updating the scoliosis imaging protocol and holding education sessions with the spine surgeons.
- The protocol was amended to scanning all the patients' with scoliosis in the [PA view](#) (postero-anterior).
- We were able to achieve our goal by the 3rd week post-intervention.
- These guidelines have been [successfully implemented](#) and have now been extended to include patients in all age groups imaged for scoliosis.



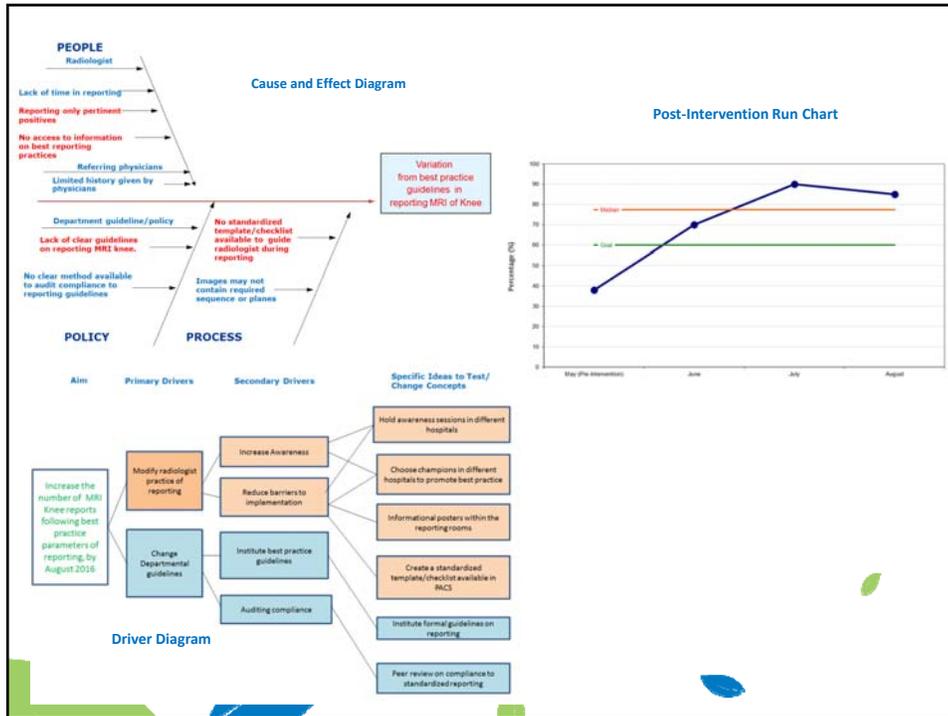
Reducing Radiation Dosage in Patients Undergoing Evaluation of the Sacroiliac Joints.

- **Modified Ferguson's view** is a technique, used to visualize both sacroiliac joints clearly in one view.
- By using this single view for the evaluation of the sacroiliac joints, instead of the routine three X-ray views (AP and 2 oblique radiographs), the radiation dose to the pelvis can be reduced significantly.
- Primary outcome measure in the pre-intervention cycle was a reduction of radiation exposure by at least **60%** - which was achieved.
- To **reduce radiation** dosage when imaging the sacroiliac joints, we replaced the current protocol of using 3 views (one anterior-posterior (AP) and 2 oblique views) with a single view which was vetted by the rheumatologists in our hospital and they agreed on the feasibility of using the modified Ferguson's view.
- We were able to reduce the average radiation - previously **28dGym2** when using the 3-views technique to the current average dose of **8dGym2** with the modified Ferguson's view, which is a **~72%** reduction.
- A secondary outcome was a significant reduction of time required to complete exam, which was previously **20 min**, as opposed to **10 min** using the modified view.



Standardization of Reporting MRI of the Knee Joint

- To improve communication of findings in the MRI knee examinations, we used The **ACR-SSR-SPR** (American College of Radiology, Society of Pediatric Radiology, and Society of Skeletal Radiology) guidelines to assess completeness of our MRI reports. We identified important anatomical structures which were infrequently mentioned or overlooked in reporting.
- Our pre-intervention PDSA cycle showed that only **38%** of the MRI reports were following the ACR-SPR-SSR criteria, with the majority of the reports not commenting on the tri-compartment cartilage. Our outcome measure for PDSA Cycle 2 aim that **60%** of reports should fulfill the aforementioned criteria.
- We implemented the best practice parameters of reporting MRI of the knee joint through radiologist education, using lectures, personal sessions and assigning quality champions.
- We were able to surpass these goals i.e. **>70%** of MRI Knee reports done in the months of June, July and August 2016 were noted to be compliant with ACR-SPR-SSR parameters.



Overall Conclusion of our Quality Storyboard

- Trainees are a unique source of quality improvement ideas as they are the ones in the front-line of patient care.
- They can also suggest realistic methods of implementation as they are in closest contact with the technical staff, referring physicians and patients.
- Our results showed that having a formal/supervised framework to incorporate trainee quality improvement ideas can enable a department to generate multiple quality initiatives, with the result of overall improvement in patient care.
- Introducing fellows and residents to quality improvement early in their career inculcates a culture of quality-driven medical care.