Project Title

Qip to Reduce Erroneous Examinations Performed Due to Wrong Laterality through Site Tagging and the Use of Visual Aids

Project Lead and Members

Project lead: Manful Chan, Melissa Liang Meishi, Tan Hui Wen, Chua Poh Hai

Project members: Chu Hao Ee Charmaine, Erwin Langit Mercado, Joshua John, Lee Tong Pao, Lim Chan Leong, Loh Shu Yen, Muhammad Radzee Bin Ramle, Noor Fadzlina Binte Zainol Abidin, Png Eng Ngee, Toh Chye Kian Michelle

Organisation(s) Involved

Ng Teng Fong General Hospital, Jurong Community Hospital

Healthcare Family Group(s) Involved in this Project

Allied Health

Applicable Specialty or Discipline

Radiology

Project Period

Start date: Nov 2019

Completed date: Aug 2020

Aims

To eliminate the number of incidents involving wrong side x-ray imaging and wrong labelling of anatomical marker by end of Nov 2020, so that no corrective actions are required. This is to safeguard patient's safety by providing accurate imaging of diagnostic quality.

Background

See poster appended / below

Methods

See poster appended / below

Results

See poster appended / below

Lessons Learnt

- The implementation of visual aids and laterality stickers has successfully reduced the frequency of laterality-related errors in general radiography examinations and achieved our target of ZERO-error. This is crucial for ensuring patient safety in all examinations, especially radiation-related.
- Consistent effort is still required to reinforce staff compliance in order to sustain the ZERO-error target.

Conclusion

See poster appended / below

Project Category

Care & Process Redesign, Quality Improvement, Clinical Practice Improvement, Value Based Care, Safe Care, Risk Management

Keywords

X-Ray Imaging, Diagnostic Quality, Labelling, Anatomical Marker

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QIP TO REDUCE ERRONEOUS EXAMINATIONS PERFORMED DUE TO WRONG LATERALITY THROUGH SITE TAGGING AND THE USE OF VISUAL AIDS

☑ SAFETY ☐ PRODUCTIVITY
☑ QUALITY ☐ COST
☐ PATIENT EXPERIENCE

MEMBERS:

Manful Chan (Project Owner), Melissa Liang Meishi (Facilitator), Tan Hui Wen (Project Leader), Chua Poh Hai (Project Leader), Chu Hao Ee Charmaine, Erwin Langit Mercado, Joshua John, Lee Tong Pao, Lim Chan Leong, Loh Shu Yen, Muhammad Radzee Bin Ramle, Noor Fadzlina Binte Zainol Abidin, Png Eng Ngee, Toh Chye Kian Michelle

Define Problem, Set Aim

Problem/Opportunity for Improvement

Between Feb to Dec 2019, there were 11 X-ray incidents involving wrong side and wrong labelling of the anatomical marker on the X-ray images that were picked up by radiologists. To prevent erroneous diagnosis, retrospective corrective actions were done immediately by radiographers to rectify the images in PACS.

Aim

To eliminate the number of incidents involving wrong side x-ray imaging and wrong labelling of anatomical marker by end of Nov 2020, so that no corrective actions are required. This is to safeguard patient's safety by providing accurate imaging of diagnostic quality.

Establish Measures

Outcome Measures

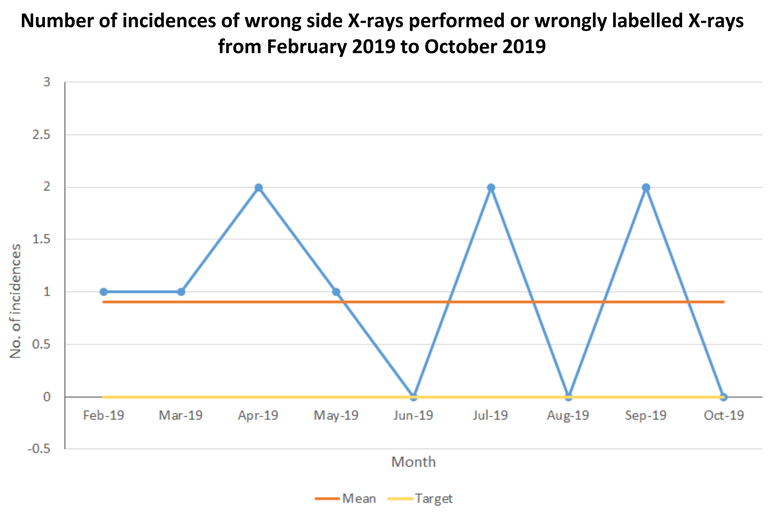
- No. of incidences of wrong side X-rays performed or wrongly labelled X-rays picked up by retrospective audit and radiologist feedback

Process Measures

- Compliance on use of visual aids and laterality stickers

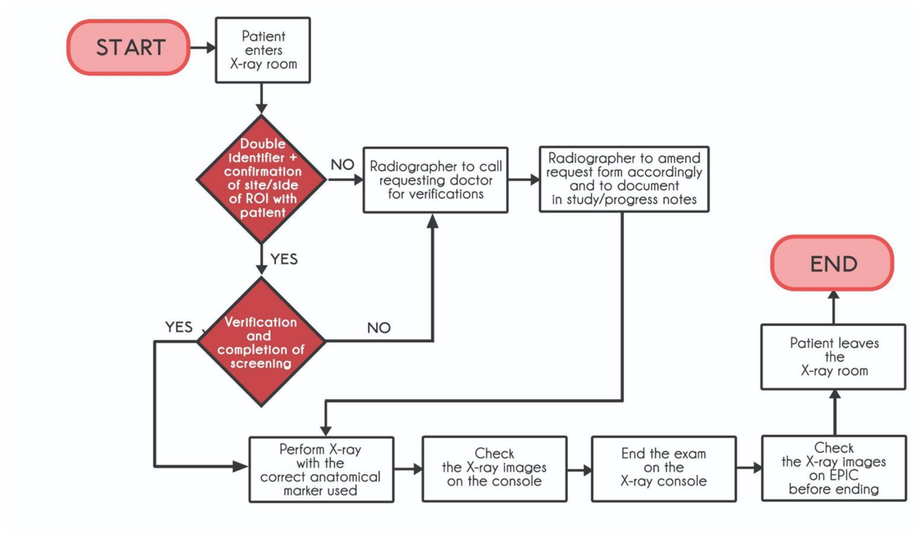
Balancing Measures

- Length of time radiographer takes to do the examination with visual aids and laterality stickers
- Radiographers' feedback with respect to change implemented

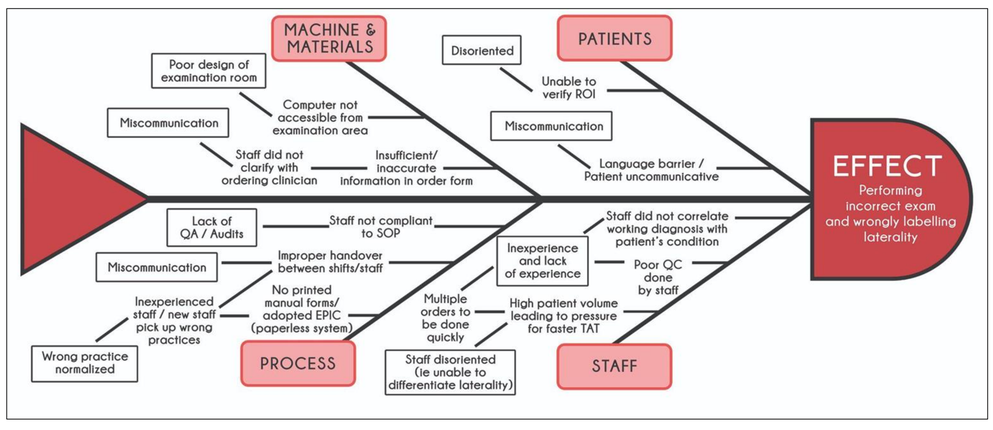


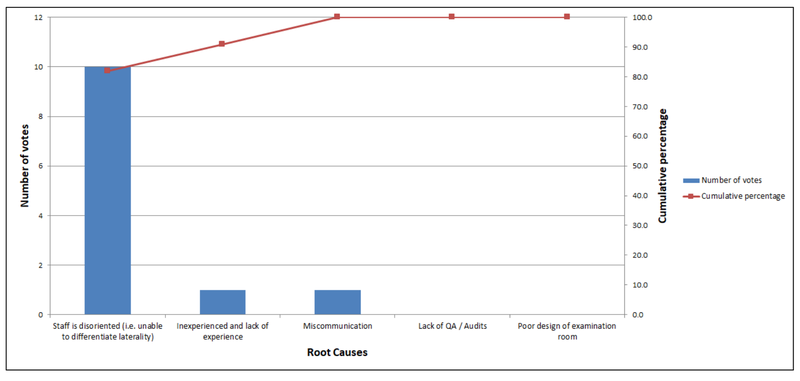
Analyse Problem

Processes before interventions



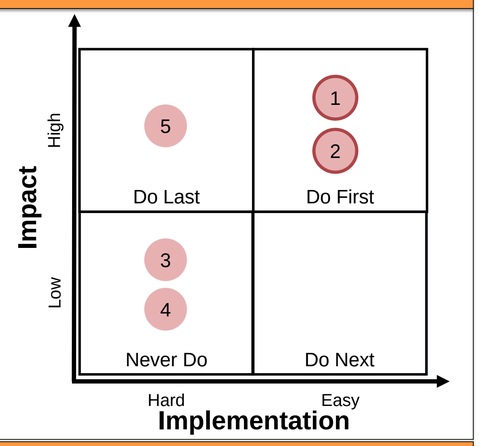
Potential root causes





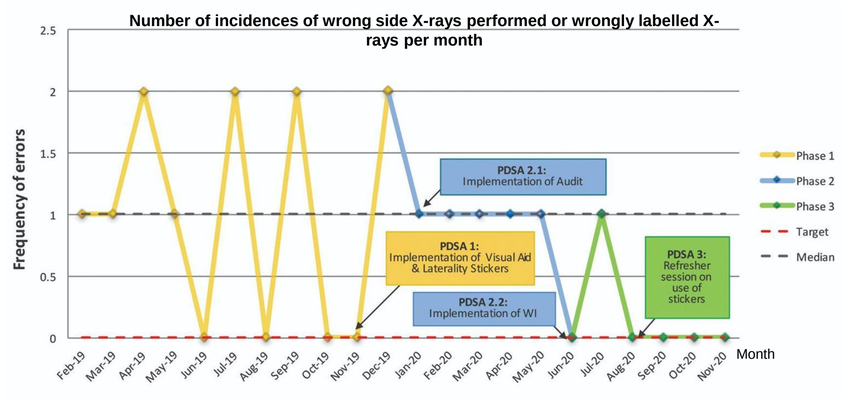
Select Changes

Root Cause		Potential Solutions
Staff disoriented (ie unable to differentiate laterality)	1	Use of visual aids in procedure rooms
	2	Laterality sticker tagging on patients
	3	New patient gowns with laterality indicated clearly
	4	Use of Augmented Reality (A.R.) during x-ray examinations
	5	Patient wear laterality bands indicating region of interest



Test & Implement Changes

CYCLE	PLAN	DO	STUDY	ACT
1.1	• To test whether visual aids and laterality stickers reduces erroneous X-ray examinations due to wrong laterality or side in ED X-ray setting • Period: 2 weeks (starting from 14/11/2019) • Participants: Radiographers rostered to ED X-ray			• To adopt for the next cycle and find out the exact compliance rate of utilizing the visual aids and laterality stickers through a monthly audit
1.2	• To expand the areas of stickers usage to include ED X-ray and IP X-ray • Period: 2 weeks (starting from **28/11/2019**) • Participants: Radiographers rostered to ED X-ray and IP X-ray	• The plan was carried out accordingly • Received positive feedback from radiographers	• The post-implementation result shows a reduction in erroneous X-ray examinations due to wrong laterality or side. However, the compliance rate was around 80%	• To adopt for the next cycle and find out the exact compliance rate of utilizing the visual aids and laterality stickers through a monthly audit
1.3	• To introduce visual aids and laterality stickers in all General X-ray setting (ED X-ray, IP X-ray, OP X-ray) • Period: 2 weeks (starting from **12/12/2019**) • Participants: All radiographers performing General X-ray duties			• To adopt for the next cycle and find out the exact compliance rate of utilizing the visual aids and laterality stickers through a monthly audit
2.1	• To test the compliance of the visual aids and laterality stickers usage through monthly audits • Period: From **01/01/2020** • Participants: Audit team which comprises of Principal radiographers and Section In-Charge (s)	• Received mostly positive feedback from the audit team	• The post-implementation results did not show a 100% compliance rate	• To adapt cycle 2.1 and introduce implementation of Work Instructions (WI) which states using visual aids and laterality stickers as new mandatory workflow to help improve compliance rate in the next PDSA cycle
2.2	• To test whether introducing the WI which includes the mandatory use of visual aids and laterality stickers will improve the compliance rate and decrease the number of erroneous X-ray examinations done in the Radiology Department • Period: From **01/06/2020** • Participants: Change in WI was broadcasted to all radiographers performing General X-ray duties	• The plan was carried out accordingly • Obtained positive feedback from all the participating radiographers	• The post-implementation results showed that there was much improvement (>95%) compliance rate, but an error was detected in July through the X-ray audits • There was no feedback given by the reporting radiologists	• To adopt the plan accordingly
3.1	• To test whether conducting a refresher session on how to properly use the visual aids and laterality stickers will sustain the result • The session was conducted by the QI project co-lead, targeting all the radiographers doing General X-rays • Period: From **14/07/2020**	• The plan was carried out accordingly • Obtained positive feedback from all the participating radiographers	• The post-implementation results showed that there were no errors made due to wrong laterality or side for a sustained period (till November 2020)	• To adopt the plan accordingly



Spread Changes, Learning Points

Spread Changes

Monitor changes

- Regular audits are conducted to closely monitor and ensure compliance of practice.
- Non-compliant staff are identified and counselled to gather feedback for reasons of non-compliance.
- Prompt revision of workflow once any potential lapse is identified.
- Continued follow up on non-compliant staff to reinforce practice and ensure lapse is corrected effectively.

Sustain changes

- Proper guidance and training of on-boarding staff to ensure compliance of the use of laterality stickers.
- Regular reminders through official channel (such as Tigertext messaging) and refresher sessions are conducted to ensure all staff are kept updated of current practice.
- Conduct sharing sessions to promote good practices and reinforce aim of these changes.
- All leaders are convinced and embraced this new professional practice to encourage those under their care

Future expansion of changes

- Extend changes from general radiography to other imaging modalities e.g. CT, MRI and Ultrasound.
- Further improve imaging standards by adding on the standardisation of anatomical lead marker placement on radiographs with use of visual aids and laterality stickers.

Key Learning Points

Strengths

- Project was focused on general radiography examinations only; this made the scale manageable as a pilot study.
- Project was well monitored, PDSA cycles were introduced in a timely and effective manner to help achieve the project target.

Limitations

- The length of pre data collection could have been longer to study for more root causes of the problem and identify any trends.
- The data collection timeline for post implementation phase could be extended to study if the change is sustainable by demonstrating with more data points to showcase a trend.

Conclusion

- The implementation of visual aids and laterality stickers has successfully reduced the frequency of laterality-related errors in general radiography examinations and achieved our target of ZERO-error. This is crucial for ensuring patient safety in all examinations, especially radiation-related.
- Consistent effort is still required to reinforce staff compliance in order to sustain the ZERO-error target.

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