Appendix 1
RCR suggested Recipe for Quality Improvement Project

Quality improvement is a team activity and sometimes Microsystems, Lean, or a blend of all is the best fit to the problem. The A3 method suggested here has been found to be helpful in structuring thought and action. Some Trusts have agreed to use one method so using the agreed approach may mean more local support and guidance.

What can we learn from Lean and the Model for Improvement?
In any healthcare process, there are value-adding activities, non-value-adding activities and waste. Toyota manufacturing developed a lean system to improve their efficiency and production through identifying muri (preparation and planning of the process), mura (implementation and uniformity), muda (continuous monitoring) and waste. Quality improvement is a systematic approach, which uses lean and other specific methods to improve one or more of the dimensions of quality in healthcare, which can concern safety, effectiveness, patient-centredness, timeliness, efficiency and equitability.

The Recipe for Quality Improvement

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Number of persons: 3-5
Advice is to include radiographers or health care/radiology assistants in the project

Time required: 2 weeks - 3 months, depending on the complexity
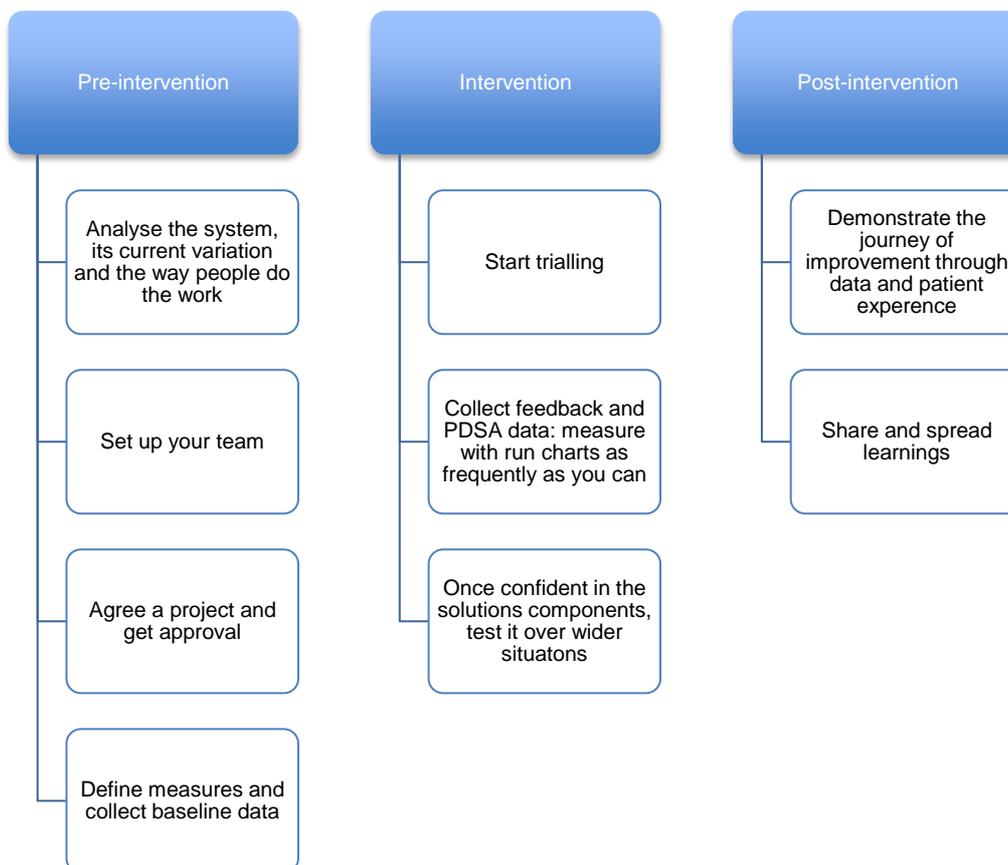
Difficulty: Not too tricky

Ingredients
1 problem
Data about the current situation
1 team
The will to improve

Methods

Pre-intervention	Intervention	Post-intervention
Analyse the system, its current variation and the way people do the work	Start trialling	Demonstrate the journey of improvement through data and patient experience
Set up your team	Collect feedback and PDSA data: measure with run charts as frequently as you can	Share and spread learnings
Agree a project and get approval	Once confident in the solutions components, test it over wider situatons	
Define measures and collect baseline data		

Pre-intervention (planning)

1. Setting up/defining your project:
Choose an area in your clinical practice that causes you frustration or one identified through a group discussion. Explore common areas to cause problems or those that have been the subject of incidents. Once you identify your area, collect data.

2. Understand the current system/conditions:
Discuss how things work with colleagues, do a root cause analysis (if applicable) and collect data/evidence. Demonstrate these visually on a flow chart. The aim is to learn how much variation there is and help the team understand the areas that should be the focus for improvement.

3. Set up an improvement team:
Identify all stakeholders in the process and benefit from their relevant expertise. Choose someone to take ownership of the project from the start. They will be acting as a sponsor and can ensure sustainability of the project as well as keep the project in alignment with the department's aims. This could be a consultant, a superintendent, nurse or a director. The sponsor or someone else can act as the main convener of meetings. The improvement team will work together as a group.

4. Develop and design your solution (countermeasures):
- The solution may require several components. Creating a map of the areas of work (action effect diagram, otherwise known as a driver diagram) on one page can help keep the team aware of the overarching aim. Make the solutions simple and easy to use. Try to ensure it is compatible with existing values and practices to ensure buy in. Test the ideas out, pilot them to see if they work and try to demonstrate observable results.
- Quick-wins should be shared with the team to maintain engagement and morale. People learn best by doing and several adaptations to an idea may be needed to refine the idea until it is as straightforward, simple, and acceptable as it can be.
- Knowledge about the local politics and pre-existing emotional aspects concerning the area for improvement is priceless. These can improve buy in, help identify and iron out potential obstacles, if dealt with appropriately.

5. Choosing your potential metrics for improvement, these can comprise:
- Process measures such as timings, compliance with an intended process, and frequency of errors or success
- Clinical outcomes such as length of stay, mortality, complications, readmissions
- Patient/staff engagement such as through surveys, standardised questionnaires, interviews and complaints

- What does good quality data look like?
  - The aim should be for data that is complete, consistent, accurate, clearly labeled, units clearly defined, and appropriate/clearly defined timescales.
  - Data plots or run charts should show when changes were tested to identify impacts and progress at frequent intervals. Regular sampling can help give an evolving picture weekly rather than to wait for weeks then putting a lot of data together.
  - Practical aspects of data collection comprise data tracked by the trust, extractable data from electronic records or data that will require clinical audit. If new data is being collected, agree with the team how this can be achieved within the workflow wherever possible to prevent adding to work, as the latter will make change harder.

6. Assign roles and responsibilities for the project team:
- At the start, choose someone to take ownership of the project (and act as the sponsor) who has the relevant expertise and position within the department/hospital.
- Assign a point of contact for the project, someone responsible for data collection, and persons in key positions to coordinate various aspects of the project.
- Always keep meetings on time and focused. This will enable busy people to attend and see that the benefits/outcomes from the meeting are clearly impacting on their work as well as patient care.

7. Stakeholder engagement, ensure you share information about the project early:
- Consider your audience
- Think about your message
- Include only relevant information
- Label clearly, avoid using acronyms and jargon
- Be concise and to the point
- Keep it simple!

8. Have you told everyone you need to? Have you got approval? Have you registered a service evaluation/audit if applicable?
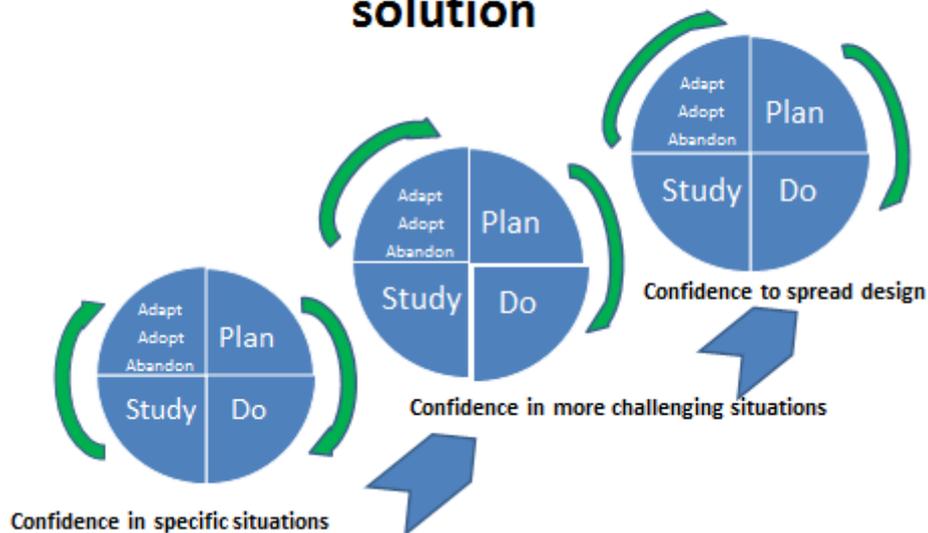
Intervention (running)

9. Implement your solution(s)
- **P**lan: create a process improvement plan. Start with baby steps and communicate it clearly. Try to have a theory or prediction of the impact thought out before you test it to help an honest analysis
- **D**o: execute your process improvement plan and provide opportunities for continuous feedback and troubleshooting
- **S**tudy and check: inspect feedback and adjust the plan accordingly
- **A**ct: integrate a process improvement plan into the system from the learning you have gained

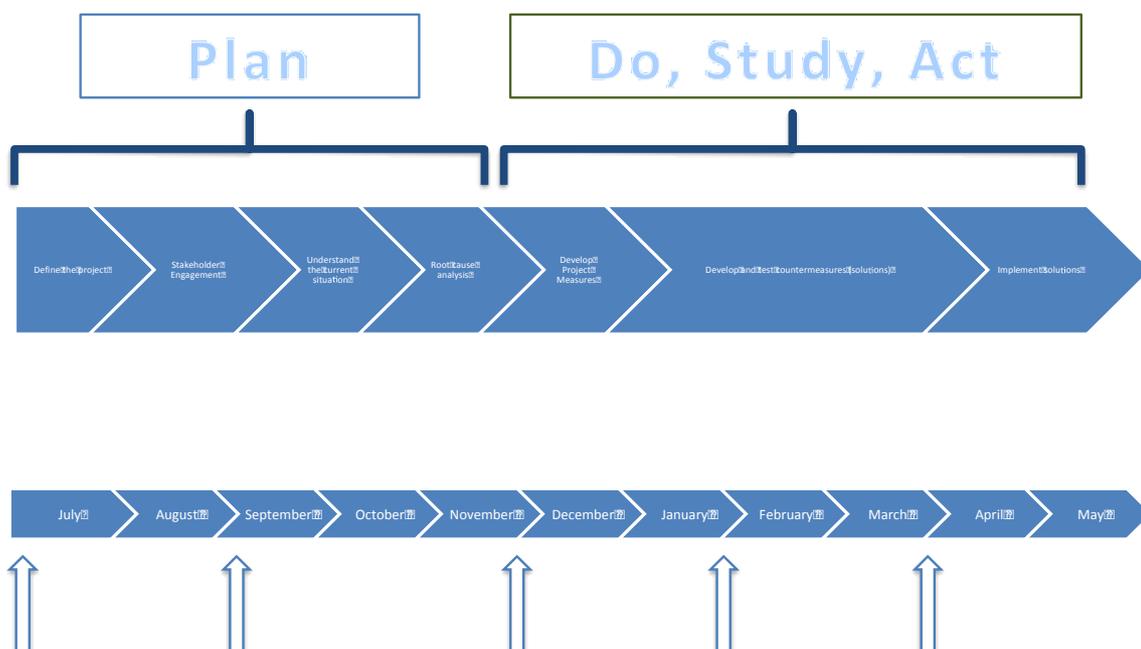Each cycle of change is a PDSA cycle.
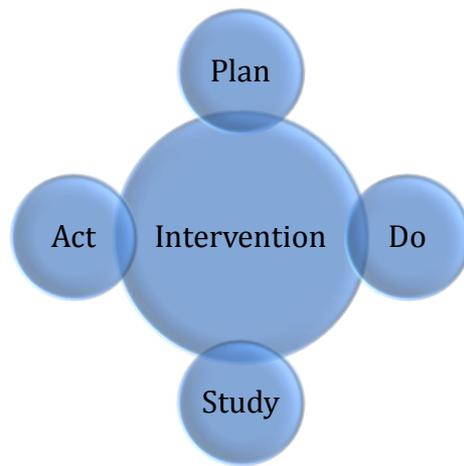
Running one PDSA regularly after another builds confidence.

Repeated cycles of testing and learning with your team will build a more resilient solution

Confidence in specific situations

Confidence in more challenging situations

Confidence to spread design

Post-intervention (sustain the gains)

10. Collect post intervention data and show change.
11. Share and spread word of your good work. Demonstrate quick wins and adhere to timescales.
12. Seek to share the learning in your system using your sponsor and explore where your improvement with or without local adaptations can improve quality elsewhere.
13. Write it up following the SQUIRE structure and publish in your hospital newsletter or journals such as BMJ Quality and Safety or BMJ Quality Improvement Reports.

Plan				Do, Study, Act			
Define the project	Stakeholder Engagement	Understand the current situation	Root cause analysis	Develop Project Measures	Develop and test countermeasures (solutions)		Implement solutions

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Useful links
Guide to quality improvement, West of England Academy, WEAHSN
http://www.weahsn.net/wp-content/uploads/A5-QI-Brochure.pdf

https://www.youtube.com/watch?v=cICymTKYQxI

https://www.youtube.com/watch?v=SCYghxtioIY

https://www.youtube.com/watch?v=6MIUqduINwQ

The Health Foundation publications on Improvement
http://www.health.org.uk/publications?theme=228#results

Institute for Healthcare Improvement
http://www.ihi.org/Pages/default.aspx
http://www.ihi.org/education/ihiopenschool/Pages/default.aspx- free to people in training

Royal College of Physicians Learning to Make a Difference
https://www.rcplondon.ac.uk/projects/learning-make-difference-ltmd

Standards for Quality Improvement Reporting Excellence. *The SQUIRE guidelines provide a framework for reporting new knowledge about how to improve healthcare. They are intended for reports that describe system level work to improve the quality, safety, and value of healthcare.*
http://www.squire-statement.org/

BMJ Quality
http://quality.bmj.com/

Please visit the QI section on the RCR website for further useful resources
https://www.rcr.ac.uk/clinical-radiology/audit-and-qi/quality-improvement-programme