



1) *The Department:*

Private radiology

• *The Team:*

Radiologist, manager, receptionist.

2) *Problem:*

- *Outline briefly the specific problem or system dysfunction that you aim to improve and how it was affecting client/patient care?*

A. **Overuse of** image guided corticosteroid injections for musculoskeletal and spinal pains on the basis of radiological reports:

- I. Inaccurate or Wrong diagnosis.
- II. Unnecessary treatment.
- III. Medical risk.
- IV. Escalating costs.

3) *Assessment of problem and analysis of its causes:*

- *Describe how you assessed the cause and extent of the problem*

Many referrals for corticosteroid injections to radiologists were 1) overuse/incorrect indications, 2) incidental imaging findings, 3) degenerative tendon disorders, 4) in patients who did not understand their condition and poor understanding on the role of corticosteroid injections, 5) a lost opportunity for a percutaneous procedure in place of surgery.

- *How did you involve the relevant staff group(s) at this stage.*

The referrers, practice managers and reception staff were educated on the limitations of corticosteroid injections.

- *How did you disseminate the analysis of the problem(s) to the staff and to the patient groups involved?*

The practice manager and reception staff were educated on 1) providing pre consult functional evaluation, 2) correlating clinical and imaging findings, 3) pre treatment evaluation, intervention and post intervention rehabilitation and follow up. Educational sessions were both formal and informal.

4) *Intervention:*

- *Describe the changes to practice needed to make improvements in care.*
 - I. Referrers were informed of clinical and radiological correlation by the treating radiologist.
 - II. Radiology procedure referral requests were discouraged.
 - III. Referrals that sought specialist review were encouraged.
 - IV. All patients fill in a pre treatment functional validated questionnaires
 - V. All patients to be clinically evaluated by the radiologist.
- *Then describe your proposed change(s) to practice in sufficient detail so that others could reproduce it*
 - I. Clear marketing strategy
 - II. Inform referrers of a pre procedural consult.
 - III. Booking staff inform patients of pre procedural consult followed by a procedure date.
 - IV. Patients complete pre procedural functional questionnaires.
 - V. Medical & financial consent.
 - VI. Post procedural 10-14 days consult to ensure no complications and instructions for graded targeted rehabilitation.
 - VII. Post treatment 3 months follow up: repeat functional questionnaire and re-examine.
 - VIII. Statistical analysis of functional scores for assessment of effect size.

5) *Strategy for change:*

- 3 years to implement.
- Regular formal and informal feedback discussions.
- Email, phone conversation, direct personal contact.

6) *Measurement of improvement:*

- *Describe your approach to measuring the effect of the change*
 - I. Formal Assessment of Direct Efficacy: Statistical testing of pre and post treatment functional scores.
 - II. Formal Assessment of Indirect Effects: eg: blood pressure, diabetes control, body weight, reduction in pain medications.
 - III. Informal Assessment: Word of mouth marketing suggested that the work was appreciated.
- *Include the analytical methods used and the results obtained.*

P value using Two Tailed tests. Cohen effect 'd' calculated as a function of difference of the mean functional scores and standard deviations.

- *Please state clearly if you do not have final results available, but indicate any preliminary and anticipated final results*

Preliminary results of pre and post function scores indicate on average 60% functional improvement ($p < 0.01$) post treatment around 6 months with a large effect size 'd' = 2.5 (95% CI 1-3).

7) Effects of changes:

- *What was the impact of your changes?*
 1. Efficacy with improved functional outcome scores.
 2. Avoidance of unnecessary medical treatment, health care costs and medical risks in these patients.
 3. Avoidance of surgery, implants, long term NSAIDS and opiates.
 4. Improved patient satisfaction.
- *Describe how far this went to resolve the problems that triggered your work*

The new model of care resulted in a rigorous correlation of clinical and radiological findings prior to deciding on appropriate treatment. The introduction of innovative techniques increased the spectrum of conditions treated.

Increasing acceptance with growth in business particularly in difficult cases and second opinions.

- *Describe the benefits, actual or anticipated, to client/patient care*

Patients on average experience 60% improvement in functionality.
- *Outline the problems encountered during the process of change*
 - I. Correlation of clinical and radiological findings was a steep learning curve at the initial stages.
 - II. Implementation of new treatment strategies within the scope of practice
 - III. Evidence base of new treatment strategies within the framework of informed consent.
- *If you are presenting longer-term follow-up results, indicate the factors that have led to sustained or spread of improvement over time*

Not applicable at this stage.

8) Lessons learnt:

- *Outline the lessons about the implementation of change that you have learnt from this work?*

Clinical musculoskeletal and spinal examination skills to correlate imaging findings.

- *What would you do differently if you were starting again?*

Marketing, educational campaign and a marketing person.

- *If your work is still in progress, indicate any anticipated challenges or obstacles for your project.*

Lack of government funding, turf battles, data & research expertise.

9) Messages for others:

- *Describe the main message from your experience described here that you would like to give to others, or to receive support from others for?*

The impact of change is most rewarding and is worth all the obstacles and difficulties encountered.

- *Describe the impact of your changes for clients/patients and for the health care system as a whole*

Direct impact 1) for patients - is appropriate allocation of necessary treatment, avoid medical risks and surgery: 2) for the health system - avoid wastage of health care dollars.

Indirect impact 1) improved health of patients, improved mobility resulting in reduced body weight, blood pressure, better diabetes control etc: 2) for the health care system is avoidance of access block due to inappropriate referrals, redirection of health care dollars for necessary treatments.

10) Please describe how you have involved patients, carers or family members in the project:

Patients and carers were informed of the new model of care delivery, innovative model that exploits the dual expertise of clinical and radiological skills.

11) Please declare any conflicts of interest below

No conflict of interest declared.

12) Ethics Approval:

All patients provided full informed consent.