

Improving patient safety and efficiency in vascular interventional radiology, using a pre-procedure team rehearsal

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BACKGROUND

Healthcare errors, particularly during surgical procedures, may lead to adverse events.¹ Approximately half of these are judged to be preventable.^{2,3} With reports of adverse events occurring in approximately 10% hospital patients,² patient safety has been identified as a priority in healthcare.

Vascular surgery has higher reported rates of adverse events than non-vascular procedures.³ Vascular interventional radiology (VIR) is a minimally invasive specialty, so it is likely that the factors affecting patient safety will be more in-line with surgery than generic radiology.

Safety and efficiency have not been comprehensively studied in VIR and there is no data in the literature concerning the type and frequency of events.

AIMS

1. To determine the *type*, *frequency* and *preventability* of events for the first time, in vascular interventional radiology (VIR).
2. To design and implement an intervention, to target frequent, preventable events and improve efficiency and patient safety.

METHODS

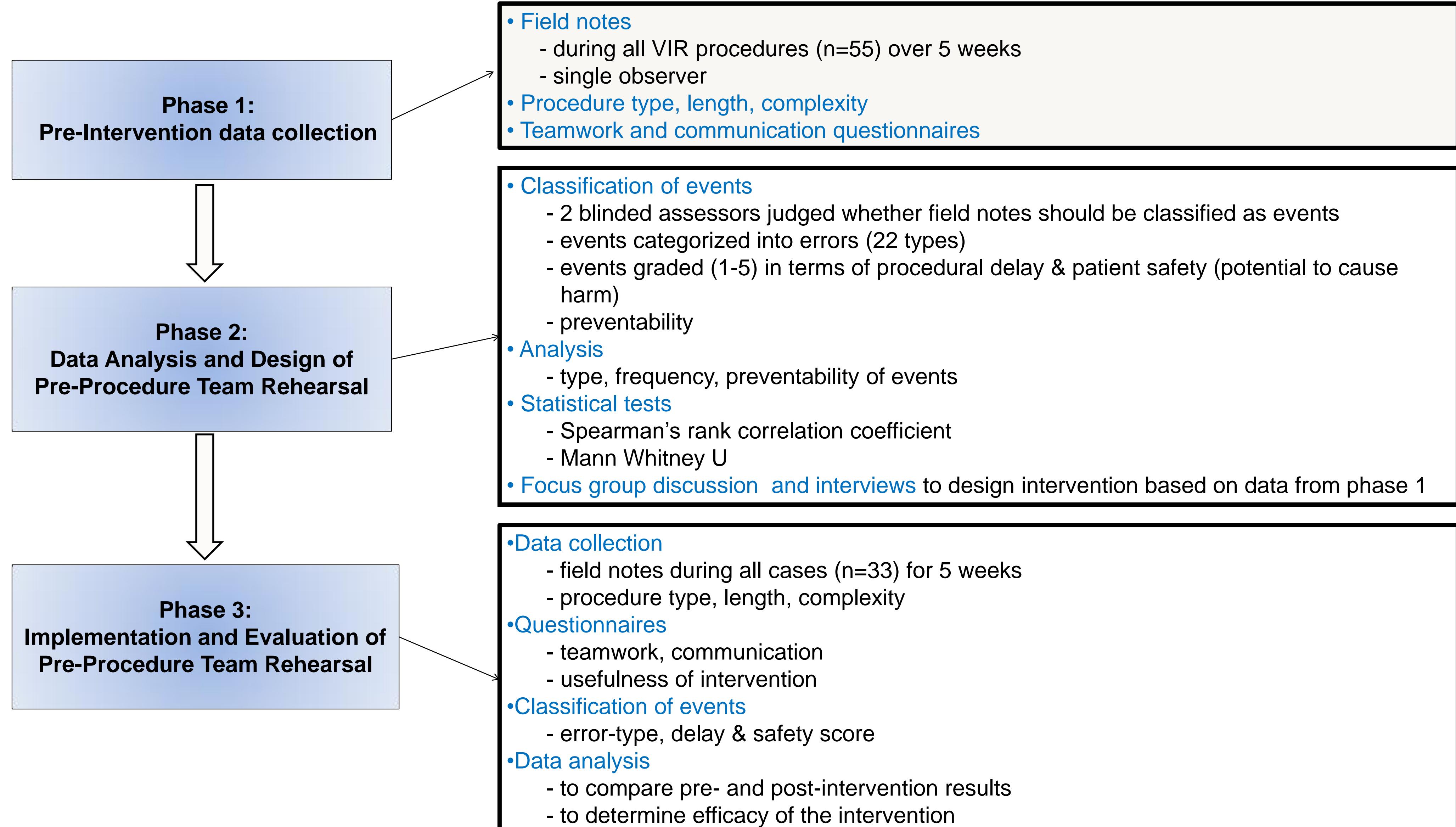


FIGURE 1: Pre-Procedure Team Rehearsal (PPTR)

- To be done at the start of every procedure
- To be led by the interventional radiology consultant (IRC)
- All teams to be present and must pause for the duration of the rehearsal
- IRC to communicate all equipment needs to the nurse and the required screening positions to the radiographer
- IRC to talk through the key steps of the procedure and where appropriate, discuss the possibility that the plan may change
- Nurse to locate all equipment and to put it all on the side, so it is ready
- If any equipment is unavailable, nurse must communicate this to IRC so that alternative equipment can be decided upon, as appropriate
- All team members to raise any questions or concerns
- IRC to confirm all team members are happy with the procedure plan before proceeding

REFERENCES

1. Hurlbert SN, Garrett J. Improving operating room safety. *Patient Saf Surg* 2009;3:25.
2. Vincent C, Neale G, Woloshynowych M. Adverse events in British hospitals: preliminary retrospective record review. *BMJ* 2001;322:517-9.
3. Gawande AA, Thomas EJ, Zinner MJ, Brennan TA. The incidence and nature of surgical adverse events in Colorado and Utah in 1992. *Surgery* 1999;126:66-75.

RESULTS

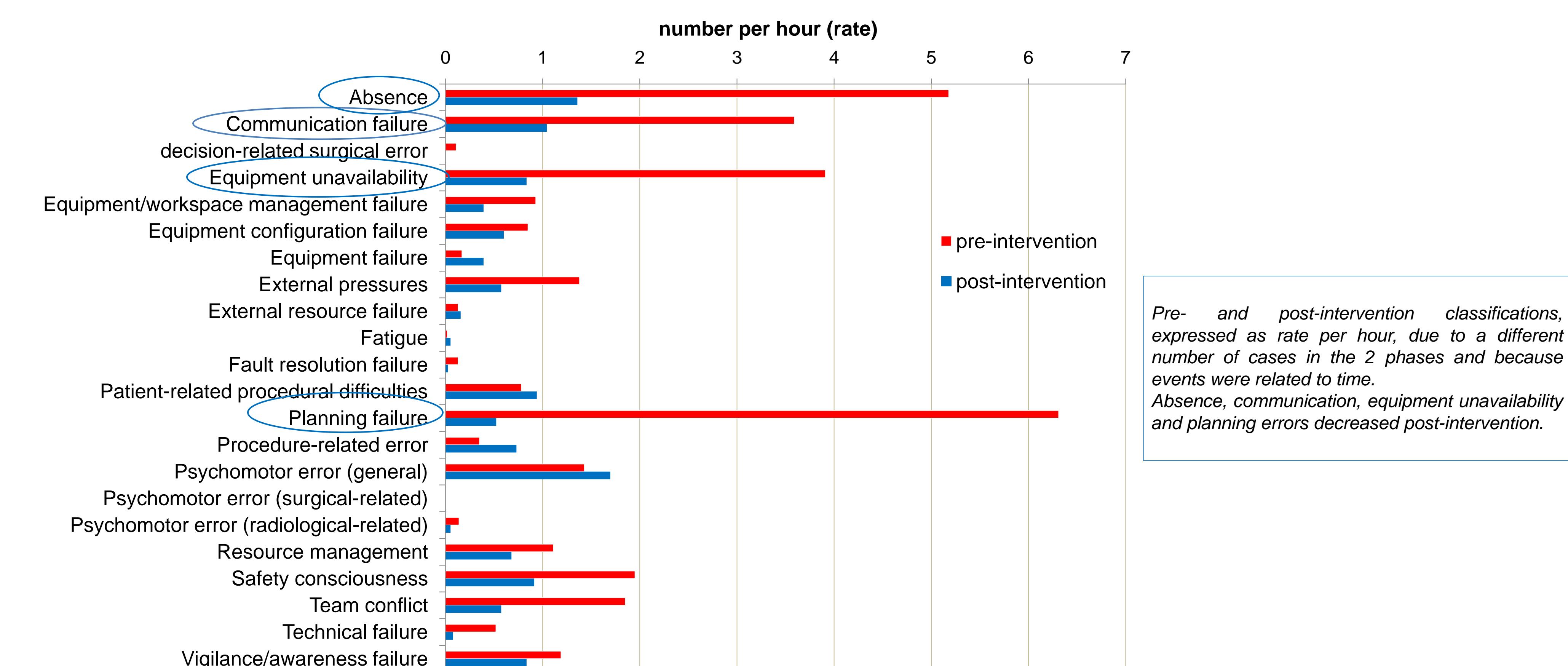
55 cases were observed pre-intervention (63hrs, 42mins). 1197 events were recorded, of which 51.1% were judged to be preventable. Each event was classified into ≥ 1 of 22 error-types, resulting in 2040 errors in total. Communication (11.2%), staff absence (16.2%), planning (19.7%), equipment unavailability (12.2%) and safety consciousness (6.1%) were the most frequent errors, accounting for 65.4% of classifications. Mean delay was 1.9/5 and mean safety score was 1.7/5.

A pre-procedure team rehearsal (PPTR) was designed, based on the most frequent, preventable events identified from pre-intervention data.

33 cases (38hrs, 19mins) were observed post-intervention. 352 events were recorded, of which 31.3% were judged to be preventable. Classification resulted in 477 errors. Mean delay was 1.7/5 and mean safety score was 1.5/5.

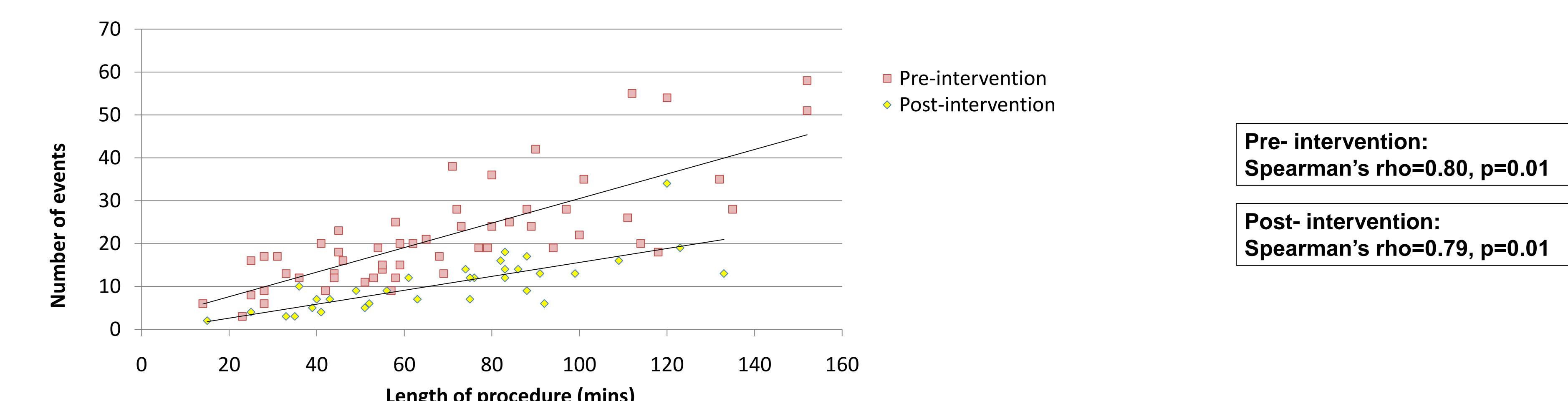
Events/hr decreased from 18.8 to 9.2 ($p<0.001$), a 51.1% reduction, with decreases in delay (57.9%) and safety scores (56.8%) per hour. Preventable events decreased from 51.1% to 31.3% ($p<0.001$).

FIGURE 2: Rate of errors observed pre- and post-intervention



Events pre- and post-intervention were positively correlated with procedure length. Delay and safety scores showed strong positive correlation with the number of events and procedure length, both pre and post intervention.

FIGURE 3: Comparison of pre- and post-intervention relationship between number of events and procedure length



CONCLUSION

- Event frequency is positively correlated with procedural length.
- Planning errors, equipment unavailability, communication errors and absence decreased post-intervention.
- Events per hour and delay and safety scores per hour decreased.
- The percentage of preventable errors decreased.
- Implementation of a pre-procedure team rehearsal can reduce the frequency of events in VIR, reducing delays and the potential for harm, thus improving safety and efficiency.**