

You Care Eye Care: A quality improvement project to prevent eye complications in the intensive care unit

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Introduction

Context

42% of patients in the intensive care unit (ICU) will suffer ocular damage during their stay (1). Multiple mechanisms that usually protect the surface of the eye are inhibited, whilst interventions such as positive airway pressure and muscle relaxants further expose the eye to harm (2). This became increasingly evident during the COVID-19 pandemic, where non-invasive ventilation (NIV) and proneing of patients further exposed patients to risk of injury (3).

Problem

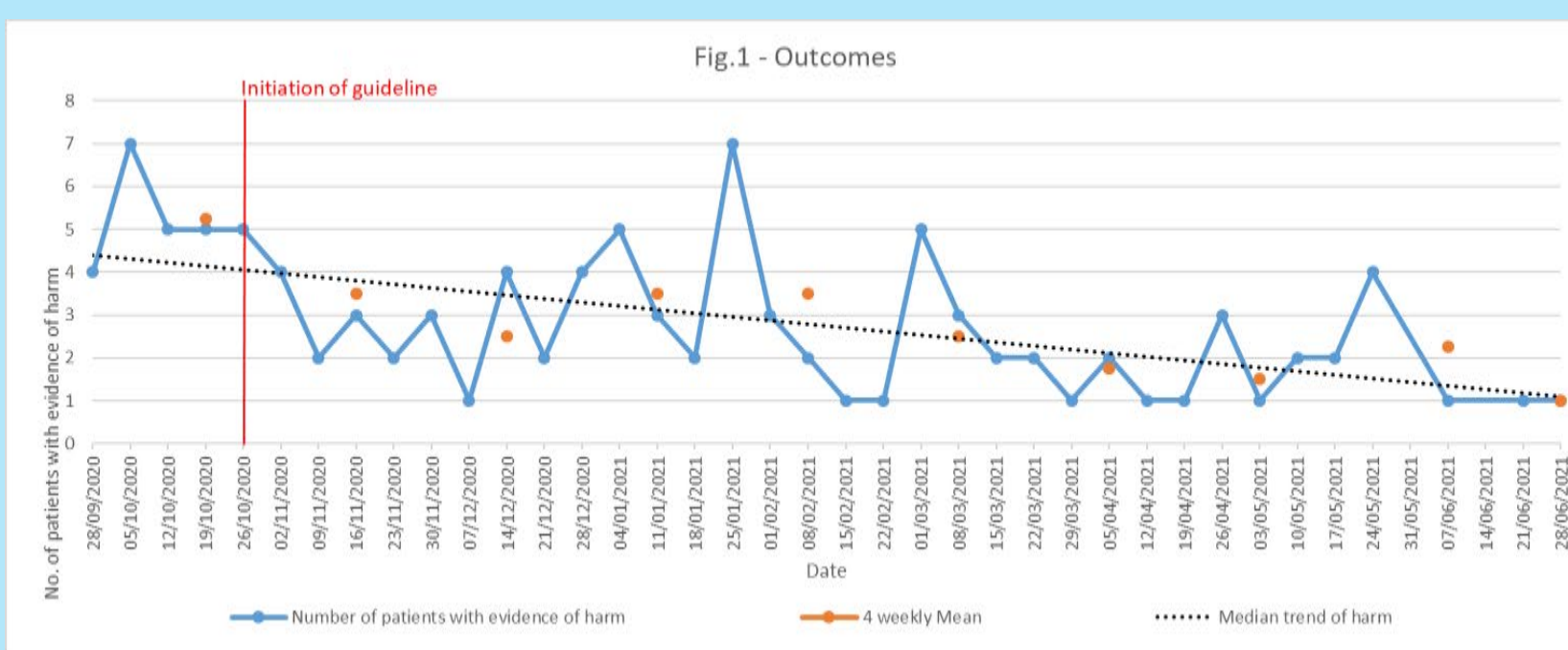
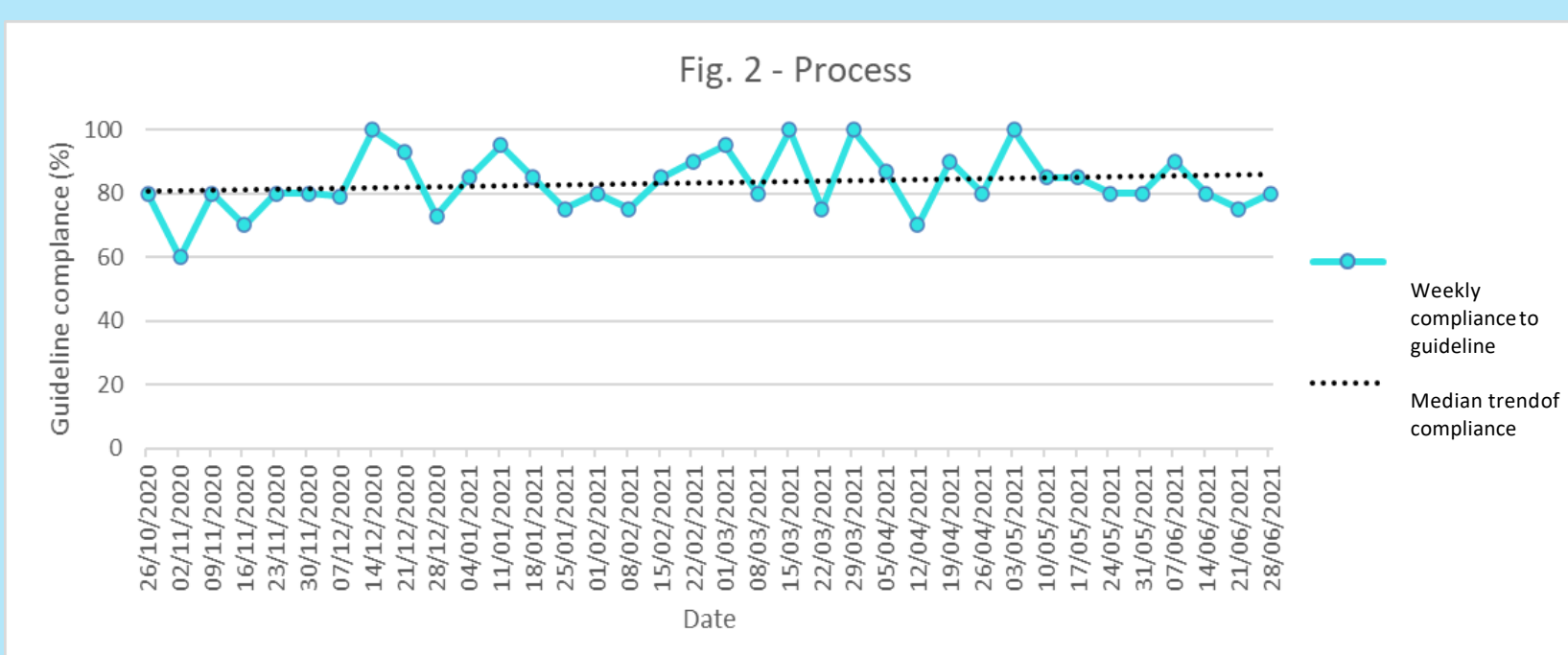
The redeployment of Ophthalmologists to the Western General hospital ICU during the first wave of the COVID-19 pandemic further highlighted the need for a robust and sustainable intervention to reduce the frequency of eye complications in our own unit in the Royal Infirmary of Edinburgh (RIE).

Our objective was to reduce harm to eyes in all patients within RIE ICU within 9 months.

Results

Effect of changes

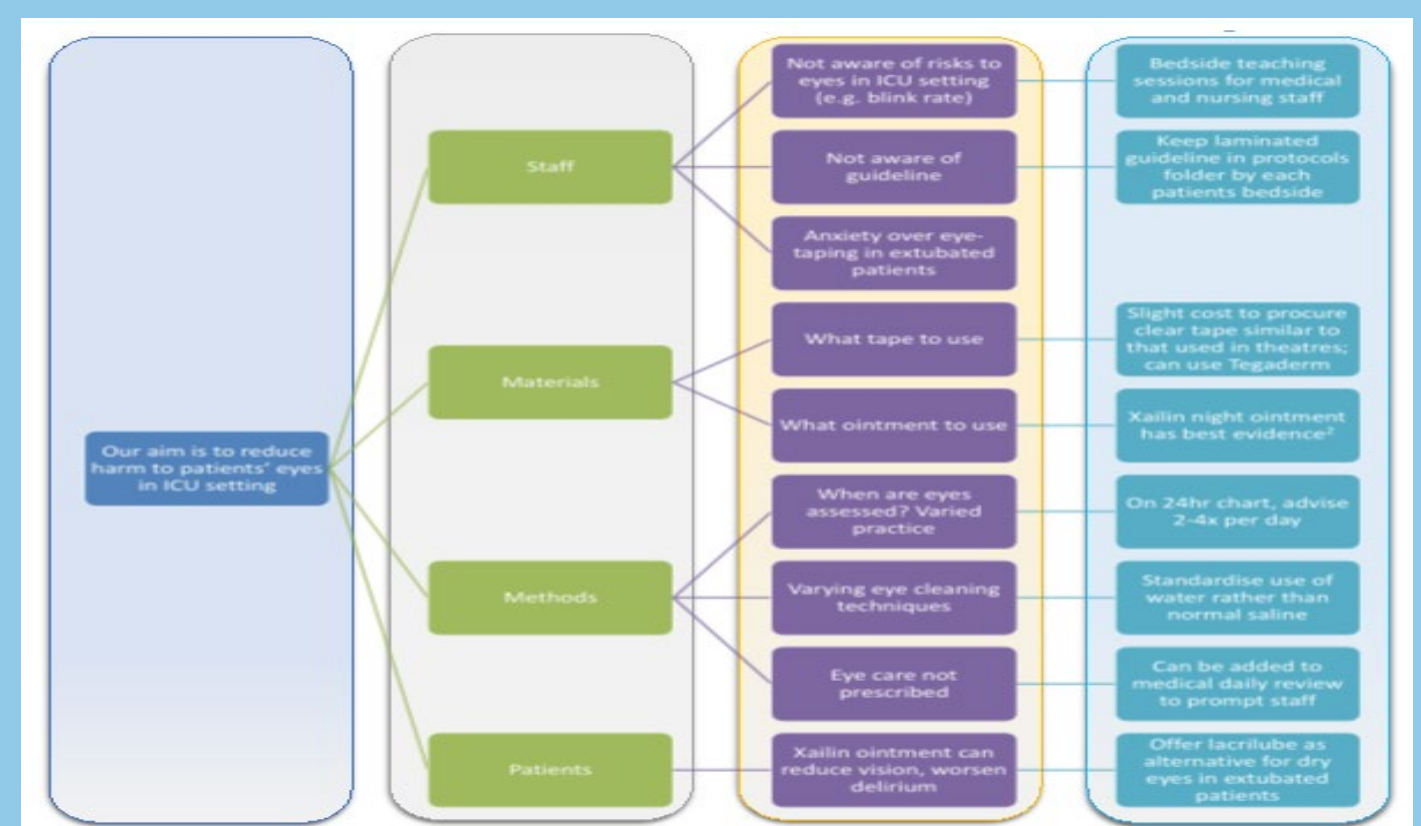
During our data collection period the introduction of our guideline and educational interventions reduced the median number of patients who suffered eye complications in ICU by 50% within 9 months. The main complications patients suffered whilst in ICU were chemosis (30 episodes) and signs of dry eyes (43 episodes). Since initiation of the guideline our educational interventions have maintained median guideline compliance of 80%.



Methodology

Assessment and analysis of problem

Our QI project involved initial staff and patient data collection regarding current eye care practices. A fish-bone diagram facilitated group discussions with ICU clinical teams regarding prior eye care practices. A pareto chart identified categories to focus on, with a driver diagram identifying change ideas. For example, concerns were raised regarding apprehension with the guideline (e.g. Taping over intubated patients' eyes) and patient issues (e.g. Xalin ointment preventing awake patients from seeing clearly). A data collection group was formed to develop a new guideline, continuously monitor the impact of the guideline on staff and patients, and improve adherence.



Intervention

Our primary intervention was the development of our eye care guideline. Multiple PDSA cycles helped identify issues for review to ultimately ensure consistent and standardised care for patients' eyes in the unit. Other interventions were also completed as test of change.

Strategy for change

Run charts were regularly reviewed and a variety of interventions were introduced throughout the data collection period as tests of change. These included 1) posters highlighting guideline enrolment 2) formal teaching at handovers and on the unit 3) educational emails to staff members 4) prompts on daily reviews to highlight eye care assessments. These prompts resulted in formal, daily documentation, ensuring accountability for eye care.

Measurement of improvement

A data collection team was established to ensure data collection was achievable. Between 28.09.20 - 28.06.21, twenty patients per week in RIE ICU were randomly selected by the data collection team. This number was chosen to ensure a reliable data pool and sustainability of the collection process.

Patient outcome - Patients' eyes were examined and noted if they had developed any evidence of harm during their stay. Patients who had evidence of ocular damage on admission were excluded, unless they developed further complications. A single episode was not counted twice.

Process outcome - Correct usage and adherence to the eye care guideline was recorded, and non-compliance was rectified following data collection.

Balancing measures - Looking at possible negative impacts of our eye care intervention and adjusting. i.e. discussing cost with pharmacy, Based on this we altered advice on eye taping. Uniquely, the data was recorded on run charts, accessible via MS Teams, allowing all project team members to review the data remotely.

Conclusion

Amendments were made throughout the process, directed by the data collection team's findings e.g. choice of ointment prescribed for awake vs intubated patients. This project has resulted in a sustained improvement of eye care standards, and a reduction of ocular complications within RIE ICU. It has highlighted that multidisciplinary input is crucial to ensure compliance and optimal outcomes. Our eye care guideline is now part of a multi-centre project to standardise care across South East Scotland.

This is a comprehensive, patient-centred, QI project, utilizing a systematic methodology to introduce a new guideline within ICU. This project was ongoing during the second wave of the COVID-19 pandemic, there was therefore a focus on making this an achievable project. By recruiting a data collection team and setting a realistic data collection cohort we ensured our objectives could be achieved. Furthermore, using MS Teams as a platform for communication meant all team members had access to raw data and live run charts.

Acknowledgements

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Ethics approval was not required.