

Evaluation of insulin infusion documentation errors pre and post Electronic Medical Record (EMR) implementation

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Introduction

- Insulin may be given via an intravenous route for patients with diabetic ketoacidosis (DKA), hyperosmolar hyperglycaemic state (HHS) or severe insulin resistance.
- Studies^{1,2} have shown that prescribing errors such as illegible handwriting, incomplete orders and incorrect doses are reduced by use of ordersets.
- At our institution, there are ordersets for DKA, HHS and non-DKA/HHS on EMR.

Aim

- To evaluate the documentation errors relating to the prescribing and administration of insulin infusions before and after the implementation of EMR.

Method

Obtained a list of patients with a diagnosis of DKA, HHS or severe insulin resistance from the patient administration system manager

Inclusion criteria

- Adult inpatients at Footscray, Sunshine or Williamstown hospital
- Diagnosis of DKA, HHS or severe insulin resistance

Inpatient paper charts between 01/12/2019 to 30/11/2020



EMR charts between 01/12/2020 to 31/11/2021

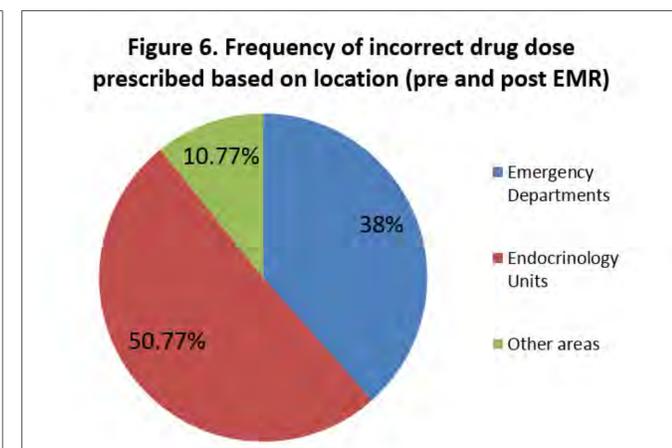
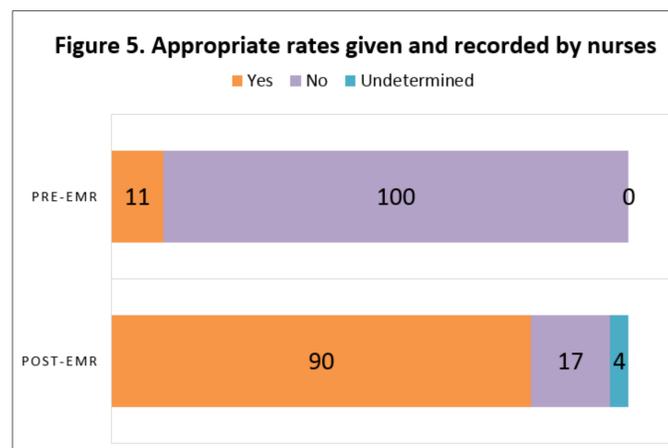
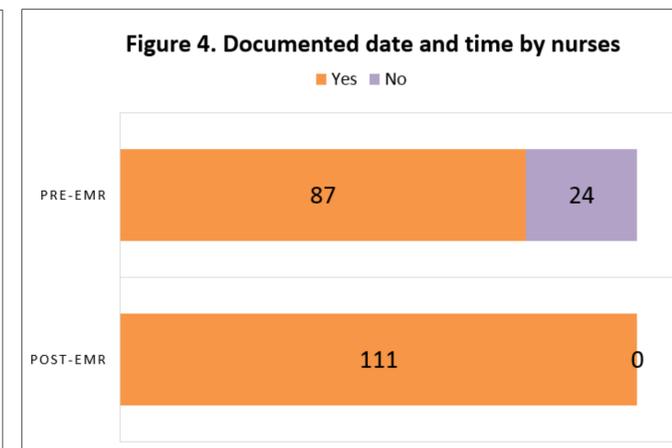
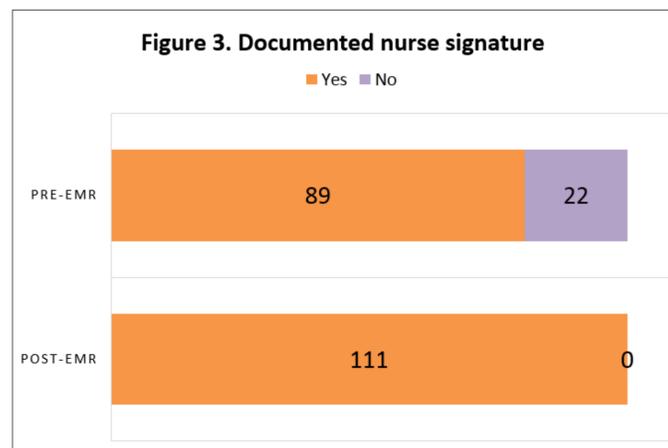
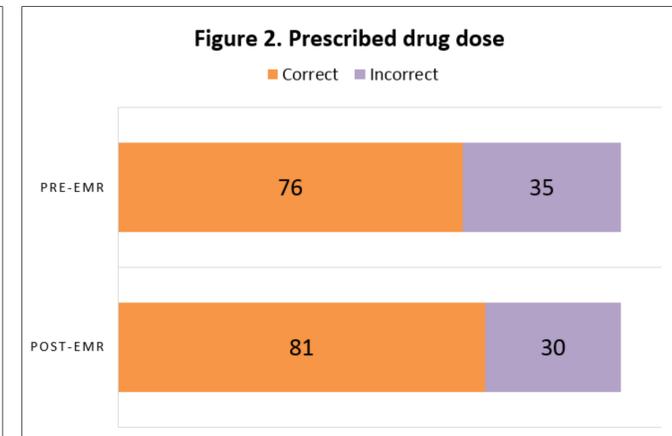
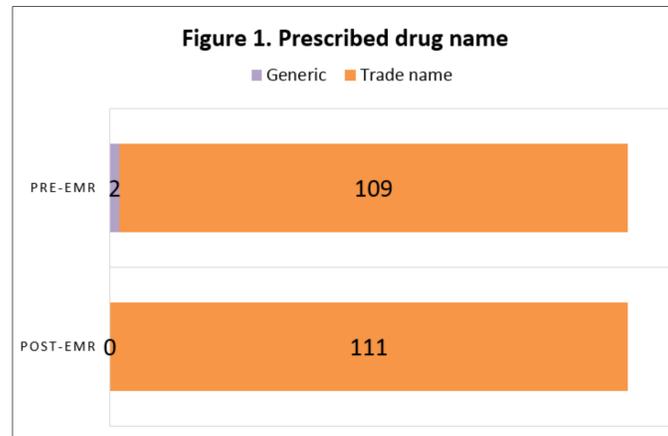


- Total 222 patients were included in this audit.
- A data collection tool was used to analyse prescribers' and nurses' documentation of insulin infusions.
- Both audit results were then compared**

Limitations

- The results of the study may not be generalised to other hospitals as other hospitals may use different electronic systems and have different protocols.
- Being a retrospective audit, this study does not capture or investigate the causes of errors.

Results



Discussion

Overall this study has shown:

- Prescribed drug name and date, time and nurse signatures entered on EMR has led to these being recorded 100% compared to that on paper charts (figure 1, 3, 4).
- 93% of errors from prescribing the incorrect drug dose were from incorrect selection of ordersets leading to the incorrect dose being administered (figure 2), consequently the incorrect infusion rates given by nursing staff (figure 5). However the difference in DKA and HHS management are relatively modest and unlikely to lead to adverse outcomes in the vast majority.
- Undetermined rates depicted in figure 5 are due to nurses not recording the blood glucose levels or only recording the total volume of insulin given.

Conclusion

- This study highlights the improvements of insulin infusion documentation with EMR however shows the key areas that still need to be addressed:
- Targeted education to the emergency departments and endocrinology units.
- Enhancements of EMR insulin infusion ordersets.
- EMR prompts to record blood glucose hence determination of appropriate insulin infusion rates.

References

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- Franklin BD, Puarr S. What is the impact of introducing inpatient electronic prescribing on prescribing errors? A naturalistic stepped wedge study in an English teaching hospital. *Health Informatics J [Internet]*. 2020 Dec [cited 2022 Mar 10];26(4):3152-3162. Available from: <https://pubmed.ncbi.nlm.nih.gov/30880563/> doi: 10.1177/1460458219833112