A Data Driven Approach to Monitored Medication Ordering

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Background

Nursing staff at a regional hospital order monitored medication ward stock quantities using their experience of anticipated ward use and previous usage recorded in the drug register.

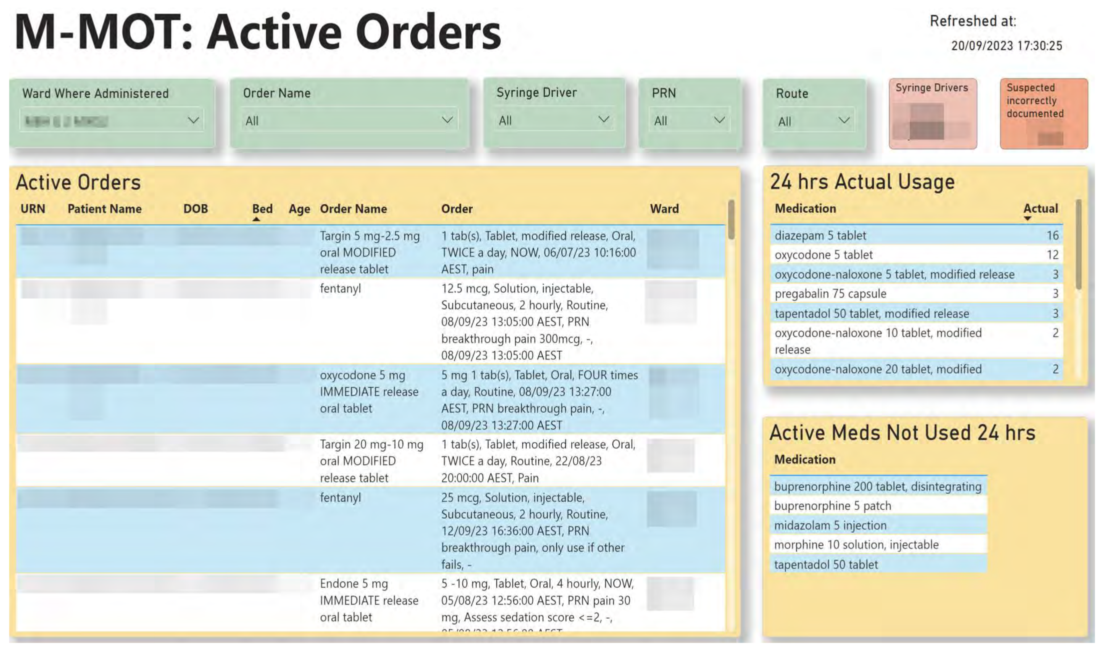
Incorrect stock on hand leads to wastage from opportunity cost, stock expiring and an increase in medication handling time resulting in medication administration delays (1, 2).

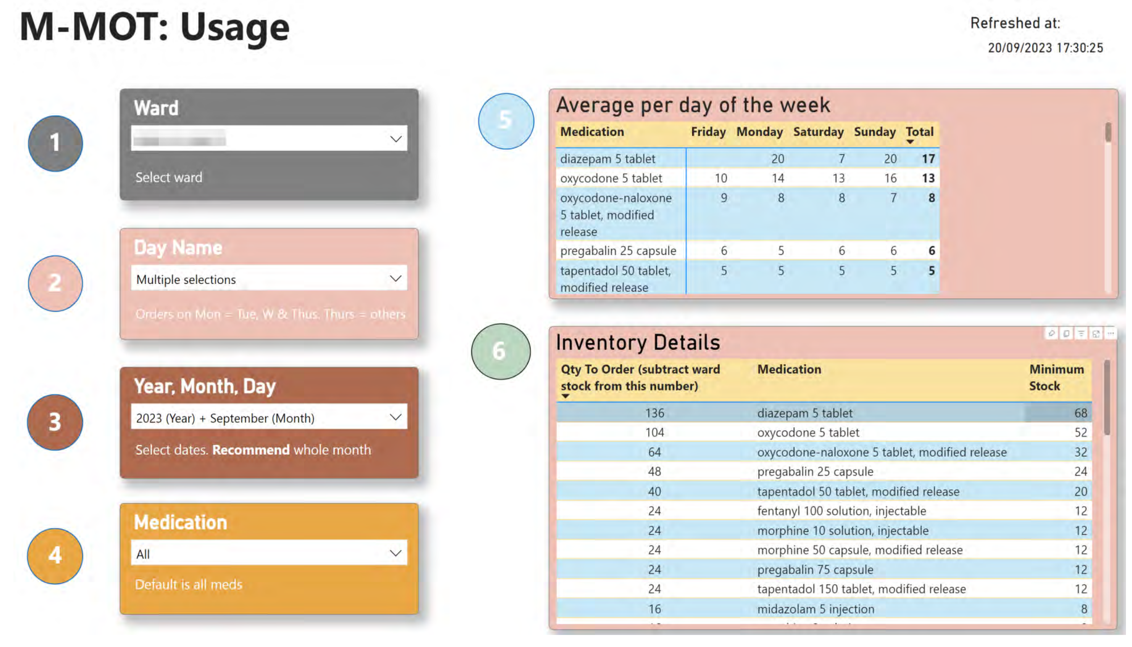
Minimum and maximum ward stock is traditionally static and does not adapt to changing prescriber preferences or patient cohort mix.

Increased inappropriate requests were noted by pharmacy staff and distribution data from iPharmacy subsequently investigated.

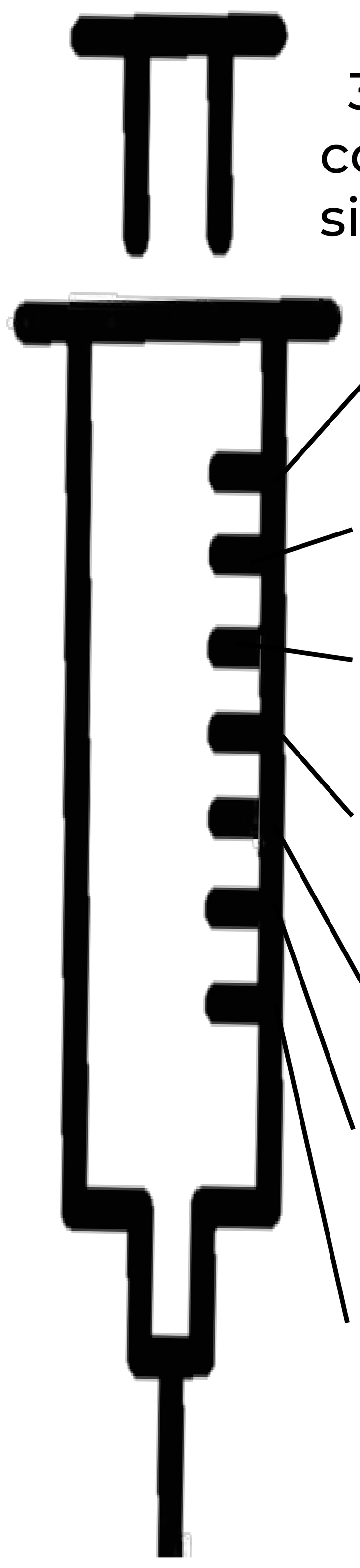
A new tool coined the Monitored Medications Ordering Tool (M-MOT) was developed aiming for flexible stock control and to reduce pharmacist and nurse workloads.

Tool User Interface





Results



3-month pre and post intervention analysis of iPharmacy and ieMR data was conducted to determine change. Chi squared testing used to determine significance.

- ↓ 20% Total distributions (94 to 75) p<0.05. Control ward distributions 99 to 101 for the same periods.
- ↑ 35% Medications administered per distribution (55 to 74) p<0.05.
- ↓ 74% No supply due to no stock significantly decreased (11/5219 to 3/5577) X^2 (1, N = 10796) = 5.13, p =.02.
- ↓ 40% Decrease in total weekend distributions (20/94 to 12/75) but not significantly X^2 (1, N = 169) = 0.76, p =0.38.
- – 0% Distributions containing one product remained the same (32/94 to 32/75) and is not significant X^2 (1, N = 169) = 1.32, p = .25.
- ↓ 3% Early/late administrations decreased (215/5219 to 209/5577) but is not significant X^2 (1, N = 10796) = 0.99, p = .32.
- ↓ 12% Total afternoon distributions decreased (50/94 to 44/75) but not significantly X^2 (1, N = 169) = 0.51, p = .48.

Methodology

- ieMR order and medication administration with iPharmacy distribution data was captured and cleansed.
- Simple stock management formulas to calculate the minimum ward stock on hand and order quantity provide ordering recommendations to the user (3).
- These calculations are agile as they update according to ward stock use and differ from the pre-intervention static minimums and maximums.

Conclusion

This novel approach to ordering is scalable, simple to use and effective.

Encouraging pilot findings and user satisfaction endorsed tool roll out to remaining hospital wards. Further adoption is required for business-as-usual sustainability.

Future work is to perform a time-in-motion study, include artificial intelligence usage prediction and more datasets from Pyxis, iPharmacy, Metavision and HS8.

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References

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