

Measuring the impact and feasibility of selected medication trigger tools across a health-system

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BACKGROUND

- Adverse drug events are a significant concern to healthcare as it is the fourth leading causes of death and accounts for billions of dollars to the US healthcare system
- The Institute for Healthcare Improvement Global Trigger Tool was created to help hospitals more effectively identify and report adverse drug events that do cause harm to the patient
- The aim of this study was to measure the feasibility and impact of implementing four trigger tools across a six-hospital healthcare system

METHODS

- Between November 16, 2020 and December 21, 2020, a weekly trigger tool report was generated based on the trigger tools that were implemented with the criteria detailed in Table 1 below
- A reviewer examined individual patient records to perform a modified chart review within the electronic health record to determine whether an adverse drug event occurred or not

TABLE 1: MEDICATION TRIGGER TOOL CRITERIA

Trigger Tool Name	Criteria
Opioid-induced toxicity	Administration of naloxone within 4 hours of opioid administration with symptoms of opioid toxicity
Benzodiazepine-induced toxicity	Administration of flumazenil within 2 hours of benzodiazepine administration with symptoms of benzodiazepine toxicity
Hyperglycemia secondary to receiving steroids	Blood glucose \geq 180 mg/dL at up to 36 hours post administration (dependent on peak action of administered steroid(s)) with administration of new or additional antidiabetic agent(s)
Hypoglycemia secondary to receiving insulin	Blood glucose \leq 80 mg/dL up to 26 hours post-administration with administration of carbohydrates at time of hypoglycemic event

FIGURE 1: REVIEW AND DOCUMENTATION PROCESS OF MEDICATION TRIGGER TOOLS

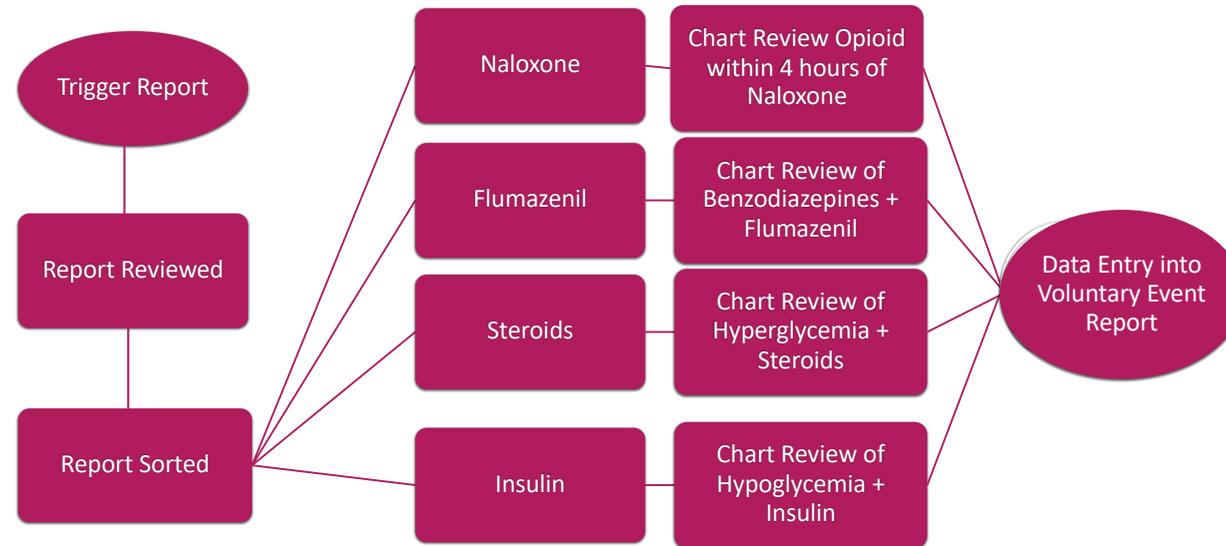


TABLE 2: MEASUREMENT OF IMPACT – ASSESSING LIKELIHOOD OF SPECIFIC MEDICATION ADVERSE DRUG EVENTS

Trigger Tool	Total Number of Charts Reviewed (n = 187)	Total Number of Adverse Events Identified from Chart Review	Positive Predictive Value
Respiratory/neurologic events secondary to opioids	12	7	58%
Respiratory/neurologic events secondary to benzodiazepines	7	6	86%
Hyperglycemia secondary to steroids	66	63	95%
Hypoglycemia secondary to insulin	83	63	76%

TABLE 3: MEASUREMENT OF FEASIBILITY - TIME SPENT PER CHART REVIEW OF MEDICATION TRIGGER TOOL

Trigger Tool Name	Average Time Per Chart Review (minutes)
Opioid-induced toxicity	23
Benzodiazepine-induced toxicity	32
Hyperglycemia secondary to receiving steroids	19
Hypoglycemia secondary to receiving insulin	13

RESULTS

- A total of 168 charts were reviewed of which 139 adverse drug events were identified (overall PPV 83%)
- A total of 2858 minutes spent performing chart reviews with an average of 22 minutes per chart review
- Benzodiazepine-induced toxicity averaged the highest amount of time per chart review whereas hypoglycemic secondary to receiving insulin averaged the lowest time
- The highest-performing medication trigger tool was hyperglycemia secondary to receiving steroids whereas the lowest performing was opioid-induced toxicity

CONCLUSIONS

- Trigger tool criteria should be modified to further increase the positive predictive value
- Lack of documentation from some individual patient records should be considered when assessing the feasibility and impact of the implemented trigger tools
- Variability regarding subjective and objective trigger tool criteria per trigger tool should be considered when assessing feasibility and impact
- Trigger tools improved event detection across a health-system and required limited resources for implementing and sustaining results

REFERENCES

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DISCLOSURE

The authors of this study have no financial disclosures or additional conflicts to report