Traffic Light System Guidelines for Preoperative Medication Administering

Jon Doran and Louise Moran
Anaesthesia Department, Letterkenny University Hospital, Co Donegal, Ireland

Often it is found that preoperative patients have had their regular medication inappropriately held and/or inappropriately given prior to presenting for surgery. On occasion this can lead to delay or cancellation of procedures, consequently, adding to growing waiting lists and expense on health services. In an original audit of preoperative medication administering it was found that as few as 50% of patients were receiving their medication correctly. Therefore, we aimed to create an easy to follow Traffic Light System of guidelines to help nursing staff and junior doctors with preoperative medication management. These new guidelines were compiled using the latest peer reviewed literature, medication guidelines and expert opinion. The new system was introduced to and trialled on the surgical wards for two weeks prior to the re-audit of 30 patients in the preoperative holding bay. Our results show that after introduction of the Traffic Light Guidelines 76% of patients had Green Light medication given appropriately pre-operatively. This result is much improved from the original audit, which was prior to the introduction of the Traffic Light System, where only 50% of patients had received their medication appropriately pre-operatively. Furthermore, our results show that 92% of patients had Red Light medication held appropriately. Finally, Aspirin which is the only Yellow Light drug in our guidelines is a regular drug in 33% of our surgical patients, however, Aspirin was held pre-operatively in 100% of patients. In summary, our results show that the introduction of the Traffic Light System greatly improved preoperative medication administering.

Introduction

Studies have shown that over half of surgical patients take regular medication and that the mean number of medications taken by patients can be as high as nine^[1]. This has the potential to cause some confusion for junior doctors and nursing staff as to the medications that can be safely given or held in the perioperative period. Moreover, there seems to be uncertainty and variation in perioperative prescribing recommendations by senior doctors^[2]. If patients have pre-operative medications mismanaged, it can lead to increased perioperative risk to the patient and/or cancellation of procedure. Therefore, we developed easy-to-follow Traffic Light Guidelines for preoperative medication management for Nursing staff and junior doctors.

Aims

- 1) To improve the number of patients receiving appropriate drugs from their regular medication pre-operatively
- 2) Compile and develop an easy-to-follow guide to pre-operative prescribing
- 3) Promote new guidelines within the anaesthesiology department, amongst junior doctors and nursing staff on the wards
- 4) Re-Audit

Methods

For each of the common prescribed medications we used a combination of peer reviewed literature, drug guidelines and expert opinion to determine their safety in the perioperative period^[3-5]. From this we developed easy-to-follow Traffic Light Guidelines for pre-operative prescribing. The guidelines were introduced to the surgical wards, nursing staff and junior doctors. After a period of two weeks we audited the pre-operative medication management of patients in the theatre holding reception. As well as medication, we checked parameters such as patient location, surgical speciality, elective vs emergency and whether anaesthetic instruction had been given pre-operatively.

Traffic Light Guidelines for Preoperative Medication

Anaesthesiology Department LUH Preoperative Medication Guidelines			
Medication		Periop management	Benefit/Risks
Anti-Arrhythmics e.g. Digoxin, Amiodarone	●	Continue therapy up to and including day of surgery	Decreases risk of post-op arrhythmias
Anti-Epileptics e.g. Levetiracetam, Phenytoin, Phenobarbital, Valproate	●	Continue therapy up to and including day of surgery	Sub-therapeutic doses of anti-epileptics can lead to perioperative seizures
Anti-Parkinsonian e.g. Levodopa/Carbidopa, Entacapone, Ropinirole	●	Continue therapy up to and including day of surgery	Withdrawal can lead to symptomatic flares, rigidity and autonomic dysfunction
Beta-Blockers e.g. Atenolol, Bisoprolol	●	Continue therapy up to and including day of surgery	Reduces ischaemia by decreasing myocardial oxygen demand
Calcium Channel Blockers e.g. Amlodipine, Nifedipine, Lercanidipine, Verapamil	●	Continue therapy up to and including day of surgery	Reduces ischaemia and SVTs
Nitrates e.g. Isosorbide mononitrate, Glyceryl trinitrate	●	Continue therapy up to and including day of surgery	Reduces risk of coronary ischaemia and hypertension
PPIs and H2 Blockers e.g. Esomeprazole, Pantoprazole, Ranitidine	●	Continue therapy up to and including day of surgery	Decreases gastric volume and increases the pH of gastric fluid
Statins e.g. Atorvastatin, Rosuvastatin, Simvastatin	●	Continue therapy up to and including day of surgery	Decreases inflammation and stabilises plaque
Aspirin	●	Usually withhold day of surgery	May increase periop blood loss but can also prevent thromboembolism
ACE Inhibitors/ARBs e.g. Perindopril, Ramipril, Losartan, Valsartan	●	Withhold morning of surgery	Risk of intraoperative hypotension
Anti-Platelets e.g. Clopidogrel, Prasugrel, Ticagrelor	●	Withhold Clopidogrel, Prasugrel 7 days prior to surgery. Withhold Ticagrelor 5 days prior to surgery	If recent coronary stenting expert opinion should be sought
Diuretics e.g. Bumetanide, Furosemide, Indapamide	●	Withhold morning of surgery	Risk of intraoperative hypotension and hypokalaemia
DOACs e.g. Dabigatran, Rivaroxaban, Apixaban	●	Withhold Dabigatran, Rivaroxaban and Apixaban for 2-3 days prior to surgery	Longer timeframes can be used for Creatinine Clearances <50 or for Neuraxial anaesthesia
Oral and Parenteral Hypoglycaemics e.g. Metformin, Gliclazide, Sitagliptin, Dapagliflozin	●	Withhold morning of surgery. Diabetic patients should be scheduled early on theatre lists	Intraoperative hypoglycaemia can be difficult to detect
Warfarin	●	Withhold 5 days prior to elective surgery. INR should be ≤ 1.4	High risk patients may require bridging

The above list is not comprehensive - please consult the relevant anaesthesiologist if there is doubt about a specific drug
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Figure 1: Traffic Light Guidelines for Pre-operative Medication Management. The guidelines were compiled from a combination of peer review literature, drug guidelines and expert opinion. They were posted in surgical wards and medication dispensing trolleys within wards. Finally, the nursing staff and junior doctors were briefed on the new guidelines and given a two week grace period before audit commencement.

Results

Demographics

80% of surgical patients were taking at least one regular medication

The surgical population were 43% Orthopaedic, 30% General Surgery, 20% Obs/Gynae and 7% Urology.

Only 27% of patients had received Anaesthetic instruction regarding preoperative medication management

Patients Given Appropriate Medication Pre-operatively (Original Audit)

Figure 2: Patients given appropriate medication pre-operatively (Original Audit). Data from the original audit showed that only 50% of patients presenting to theatre reception prior to surgery had their pre-operative medication managed correctly.

Patients Given Appropriate Medication Pre-operatively

Figure 3: Green Light Medication Given Pre-operatively. 76% of patients received their Green Light Medication appropriately pre-operatively. 24% of Patients had their medication held inappropriately.

Patients Given Inappropriate Medication Pre-operatively

Figure 4: Red Light Medication Given Pre-operatively. 92% of patients had their Red Light Medication held appropriately pre-operatively. With only 8% of patients inappropriately receiving a Red Light Medication pre-operatively.

Medication Management by Ward

Figure 5: Medication Management by Ward. This bar chart displays the performance of each ward in pre-operative medication management. The Orthopaedic Ward had over 50% of its patients managed incorrectly. The Maternity and AMAU had all patients managed correctly. However, these two wards accounted for only 8% of the audit population. Both Surgical 2 and the ERU performed very well with approximately 90% of their patients managed correctly. (Numbers in brackets over each bar represent % of patients in audit)

Comparison to Original Audit

The original Audit found that 50% of patients received their regular medication pre-operatively. This value increases to 76% of patients after the introduction of the Traffic Light Guidelines. Therefore, the new guidelines improved pre-operative medication management by over 50%. Most other parameters measured, common to both audits, showed similar results, such as the location of patient and surgical speciality. However, there was a sizable difference between audits regarding anaesthetic instruction given to patients prior to surgery, where the original audit had 80% of patients receiving instruction versus only 27% for this audit.

Discussion

Data from this audit shows that after the introduction and promotion of easy-to-follow guidelines there is significantly improved management of pre-operative medication dispensing. Moreover, the improvement can be as much as 50% just by using clear guidelines with minimal promotion to nursing staff and junior doctors. These improvements in pre-operative medication management reduce perioperative risk to patients while reducing the burden on the anaesthesiologist and healthcare system.

Conclusion

Introduction of Traffic Light Guidelines improved pre-operative medication management by over 50%.

Future Work

Taking this project forward I would increase the number of Guideline posters on each ward. I would also email a pdf of the guidelines to staff for instant access. Furthermore, I can design an App to help junior doctors and staff with preoperative medication management. These additions should bring correct management to >90%

References

- 1.Kennedy JM, van Rij AM, Spears GF, et al. Polypharmacy in a general surgical unit and consequences of drug withdrawal. Br J Clin Pharmacol 2000; 49:353.
- 2.Kroenke K, Gooby-Toedt D, Jackson JL. Chronic medications in the perioperative period. South Med J 1998; 91:358.
- 3.Spell NO 3rd. Stopping and restarting medications in the perioperative period. Med Clin North Am 2001; 85:1117.
- 4.Smith MS, Muir H, Hall R. Perioperative management of drug therapy, clinical considerations. Drugs 1996; 51:238.
- 5.<https://www.uptodate.com/contents/perioperative-medication-management>

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