

One year in ED – Discharge prescribing analysis utilising an electronic prescription database

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Aim

To determine the rates and types of prescribing of antimicrobials and opioid analgesics on discharge prescriptions from St Vincent's Hospital Emergency Department (ED) over a one year period.

Background

Until September 2016, all prescriptions for patients being discharged from the Emergency Department of St Vincent's Melbourne were handwritten. This was identified as an area of risk and inefficiency, and also made auditing prescribing practices extremely challenging.

Liaison between the Pharmacy Department and the Decision Support Unit led to the development of an electronic discharge prescription application using agile development methodology, which was named **Yulcan**.

In addition to improving prescription accuracy and process efficiency, this development has allowed for us to readily analyse prescription data.

Development of Yulcan

A process map for generating discharge prescriptions was developed, including a review of legislative requirements, particularly concerning drugs of dependence. The program was developed as a web application built in .NET 4.5 web and intranet application version 1.0

The agile nature of in-house development allowed for collaboration with medical staff and continuous feedback from users to improve usability.

Features of Yulcan

- ◆ Integration with existing Patient Administration System
- ◆ Integration with existing Medical Records Online to automatically form part of the electronic patient record and discharge summary
- ◆ Integration with the hospital active directory to ensure prescribing authority
- ◆ Generates its own Prescription Numbers (validated for PBS use)
- ◆ Links to the MIMS database and Pharmaceutical Benefits Scheme to reduce prescribing errors and maximise legislative and PBS compliance

Method

Vulcan data was extracted by the Decision Support Unit and analysed by a Pharmacist.

Several issues arose in the analysis process which had to be accounted for:

- ◆ The MIMS database stratifies by brand and strengths, therefore the data had to be reclassified to single generics
- ◆ TGA changes to medication names (e.g. amoxycillin to amoxicillin) created even more product names
- ◆ Vulcan's free-text typing capacity created several instances of incorrectly spelled medications (e.g. "oxynorn" [sic], "oxyxodone" [sic], "Neurofen" [sic]) which had to be manually removed

Comment

Whilst it was beyond the scope of this analysis to review the **appropriateness** of prescriptions, it has shown **large absolute numbers** of prescribed medications which may **not be optimal first-line agents**, such as cephalosporins, broad-spectrum penicillins, and readily-divertible forms of a potent opioid agent.

Conclusion

The Vulcan program has enabled us to easily conduct this analysis which could lead to further investigations, potentially improving prescribing practices from our Emergency Department.

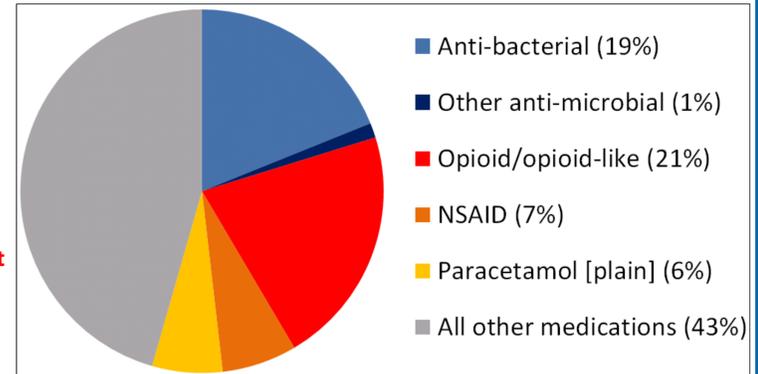
Poster 163; Medicines Management 2017, The 43rd SHPA National Conference. Sydney, Australia.

Results—Overall

Over the 12 months since implementation

- ◆ 6,805 prescriptions were written on Vulcan
- ◆ 11,504 individual medications were prescribed on discharge scripts
 - ◇ 2,326 were an anti-microbial agent
 - ◇ **2,175 were anti-bacterial agents**
 - ◇ **2,449 were an opioid or opioid-like agent**
- ◇ Comparatively there were 1,487 non-steroidal anti-inflammatory drugs or paracetamol (non-combination) preparations prescribed

Figure 1: **overall** number of prescribed medications



Results—Antimicrobial Agents

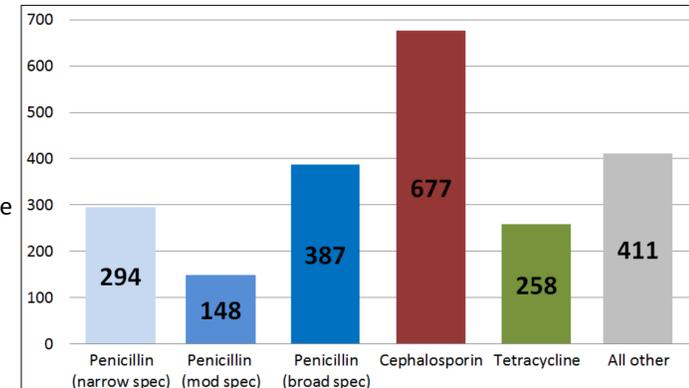
Figure 2 displays prescriptions for anti-bacterial agents broken down into broad classes.

It is interesting to note the rates of **broad-spectrum penicillin (18%, n = 387)** and **cephalosporin (31%, n = 677)** anti-bacterials.

As per *Therapeutic Guidelines: Antibiotic*, these are not the agents of first choice for community-acquired pneumonia¹ or cellulitis², two very common presentations to the ED.

This may suggest the need to audit use of such agents to ensure compliance with guidelines.

Figure 2: number of **anti-bacterial** prescriptions



Results—Opioid or Opioid-like Agents

Figure 3 shows the number of prescriptions which contained any opioid medication (including over-the-counter codeine preparations), tramadol or tapentadol.

Oxycodone is clearly a highly prescribed medication from the emergency department, with **immediate-release 5mg preparations** making up **60.9%** of opioid or opioid-like agents, and at a rate of 13.0% of **all prescriptions** from the ED.

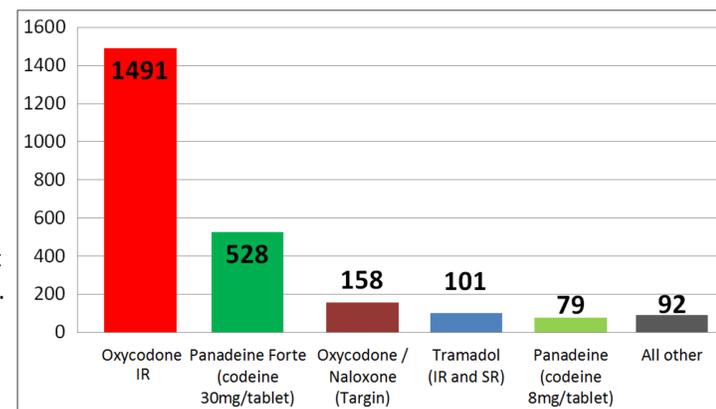
Oxycodone is indisputably an effective medication for the treatment of acute pain. However, it is not the only treatment option.³

Furthermore it is known that illicit abuse of prescription opioid agents, such as oxycodone, is on the rise within the Australian community which is leading to increased morbidity and mortality.⁴⁻⁵

In this analysis, immediate-release oxycodone prescriptions were more numerous than any other pain-killer, exceeding the combined number of non-combination paracetamol (n = 720) and NSAID (n = 767) prescriptions. Two counter arguments could be that prescribers may not have bothered supplying a prescription for these latter two classes as they can be obtained without a prescription. Additionally, perhaps many prescriptions were given only after patients had already failed self-management with over the counter preparations.

However, immediate-release oxycodone outranked even prescription strength paracetamol/codeine preparations by a rate of nearly three to one.

Figure 3: number of **opioid or opioid-like** prescriptions



Results—the Top Ten Medications

The top ten prescribed medications overall were:

1. Oxycodone IR	(n = 1491)	(13.0%)	6. Prednisolone	(n = 491)	(4.3%)
2. Paracetamol	(n = 720)	(6.3%)	7. Co-Amoxyclyav	(n = 387)	(3.4%)
3. Cefalexin	(n = 659)	(5.7%)	8. Pantoprazole	(n = 329)	(2.9%)
4. Ibuprofen	(n = 553)	(4.8%)	9. Ondansetron	(n = 288)	(2.5%)
5. Panadeine Forte	(n = 528)	(4.6%)	10. Doxycycline	(n = 258)	(2.2%)

References

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