Potentially inappropriate prescribing – a good barometer of medication safety?

Frank Moriarty
HRB Centre for Primary Care Research, RCSI

Reducing Medication Errors in Healthcare Services Conference – 26th June 2014

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PRIMARY CARE RESEARCH

Overview

- Medication safety thermometer (MST)
  - What is MST?
  - Developing a MST?

- Potentially inappropriate prescribing (PIP) on the spectrum of medication errors

- Impact of PIP on patient safety

- Available PIP indicators

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Centre Aims and Objectives

Primary care is facing many challenges in the 21st century. Not least are the complexities of managing multi conditions in patients who span the primary/secondary care interface, maintaining evidence-based practice terms of diagnosis and referral; and making sure that patients receive appropriate and safe medicines.

The HRB Centre for Primary Care Research aims to establish standards for the quality of care of vulnerable p groups, namely older adults, children, drug users and pregnant women, with a particular emphasis on effecti medicine monitoring (work package 1). Evidence-based diagnoses are also a priority for the Centre (work pa 2). A register of clinical prediction rules (CPRs) is being established, in conjunction with systematic reviews common clinical conditions in relation to the diagnostic accuracy of symptoms, signs and diagnostic tests av to GPs. Finally, based on the observational epidemiological research concerning quality of care and medicine management, as well as the CPR register, work package 3 involves the development and evaluation of Infor and Communication Technology (ICT) interventions in the form of computer-based clinical decisions support systems (CDSSs), decision aids and self management programmes.

Zero Tolerance Prescribing and Medication Safety Thermometer

Key pointers on developing a medication safety thermometer in your organisation

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What is Medication Safety Thermometer?

- National tool developed in the NHS[1]
  - "It is a temperature check on medication safety"
  - "...call to action for frontline staff"

- Purpose
  - Measure medication error and harm from error
  - A baseline to direct improvement efforts and from which to measure improvement over time
  - Build awareness, engage teams

What is Medication Safety Thermometer?

- NHS guideline:
  - Performed one day per month
  - Three step process to measure a number of key factors for each patient in sample
  - Acute services: 100% of patients on 5 surgical wards & 5 medical wards
  - Community services (community hospitals, intermediate care, nursing services): 100% of patients up to 200
  - Webtool to upload and analyse data www.SafetyThermometer.nhs.uk

Medication Safety Thermometer 3 step process

'Error Free' Care	'Harm Free' Care	
All Patients	**High Risk Meds + Trigger**	**MDT Huddle and reporting of harm**
Step 1	Step 2	Step 3
Patient information Medicines reconciliation No. of medicines Medicines allergy status No. of omissions High risk meds -Anticoagulants -Insulin -Opiates -IV or SC Sedatives	If the patient is on any high risk medicines then answer additional questions Eg. Anticoagulant (Yes) • Has the patient had a bleed? Yes/No • Has this person had Vitamin K? Yes/No • INR outside of limits (greater than 6) Yes/No	If answered yes to any of the trigger questions discuss as an MDT and report: • Level of harm No Harm Low Harm Moderate Harm Severe Harm Death • Learning

Developing a Medication Safety Thermometer

- NHS design principles:
  - Clinically valid
  - Efficient
  - Equitable and transferable across patient settings
  - Timely
  - Patient-focused
  - Focused on actual harm
  - Easy to aggregate

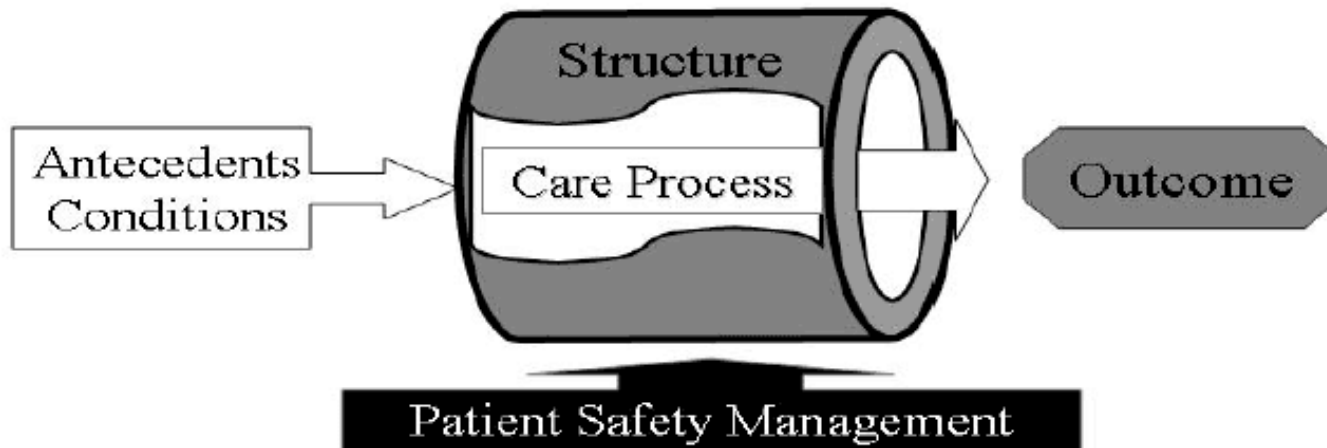# Developing a Medication Safety Thermometer

- Data sources:
    - Administrative data
    - Incident reporting
    - Point of care surveys
    - Case note review

- Probably no one comprehensive source

    → Use several sources or monitor only indicators available from one source

Developing a Medication Safety Thermometer

- What to measure?

Donabedian model for evaluating quality of medical care[2]

Table 7   Medication Incidents by category of error reported*

Category of error	Incidents	Percent of medication incidents
Omitted and delayed medicine	82,028	15.58
Wrong dose or strength	80,170	15.23
Wrong medicine	48,834	9.28
Wrong frequency	44,165	8.39
Wrong quantity	28,764	5.46
Mismatching between patient and medicine	21,915	4.16
Wrong / transposed / omitted medicine label	13,755	2.61
Patient allergic to treatment	11,695	2.22
Wrong formulation	11,254	2.14
Wrong / omitted / passed expiry date	10,998	2.09
Wrong storage	10,447	1.98
Unknown	10,024	1.90
Wrong method of preparation / supply	9,840	1.87
Wrong route	7,934	1.51
Contra-indication to the use of the medicine in relation to medicine or condition	7,632	1.45
Adverse drug reaction (when used as intended)	5,939	1.13
Wrong / omitted verbal patient directions	1,383	0.26
Wrong / omitted patient information leaflet	1,156	0.22
Blank	129	0.02
Other/not specified	118,317	22.48
Total	526,379	100.00

Notes   * Based on the May 2011 extraction following clinical validation for deaths and severe harm

Table 8   Medicines/therapeutic groups identified in incident reports with clinical outcomes of death and severe harm*

Medicine or therapeutic group*	Death	Severe	Total	Percentage of medication incidents with fatal and severe harm outcome†
Opioids	46	43	89	10.83
Antibiotics	10	38	48	5.84
Warfarin	15	30	45	5.6
LMWH‡	23	23	46	5.6
Insulin	9	37	46	5.6
Benzodiazepines	15	12	27	3.28
NSAIDs§	1	17	18	2.19
Potassium	7	8	15	1.82
Adrenaline	8	4	12	1.46
Phenytoin	1	11	12	1.46
Amiodarone	3	4	7	0.85
Anti-psychotics	2	5	7	0.85
Methotrexate	2	3	5	0.61
Total	142	235	377	45.99

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Potentially inappropriate prescribing on the spectrum of medication errors

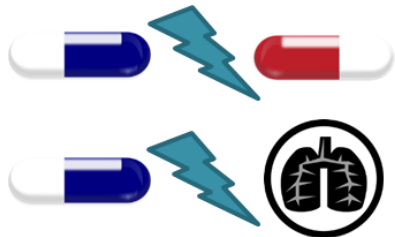Division of Population Health Sciences

Potentially inappropriate prescribing

- Prescribing is a challenging and complex process
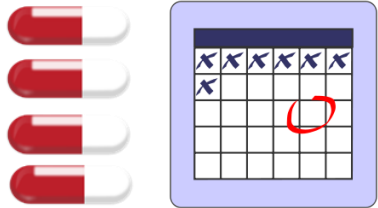
- Some patient groups particularly vulnerable to adverse effects of medicines

- What is potentially inappropriate prescribing (PIP)?

- Determined implicitly or explicitly

Potentially inappropriate prescriptions as determined by STOPP criteria

Criterion

Cardiovascular system

Digoxin >125 μg per day with impaired renal function

Thiazide diuretic with history of gout

β-blocker with COPD

Diltiazem or verapamil with NYHA class III or IV heart failure

Calcium channel blockers with chronic constipation

Dipyridamole as monotherapy for cardiovascular secondary prevention

Aspirin with history of PUD without histamine H2 antagonist or PPI

Aspirin ≥150 mg/day

Aspirin with no history of coronary, cerebral or peripheral vascular symptoms or occlusive event[a]

Central nervous system

TCA with dementia

TCA with cardiac conductive abnormalities

TCA with constipation

TCA with prostatism or history of urinary retention

Long-term, long-acting benzodiazepines

Long-term neuroleptics in those with Parkinsonism

Prolonged use of first generation antihistamines

Gastrointestinal system

Diphenoxylate, loperamide or codeine phosphate for treatment of diarrhoea of unknown cause

Diphenoxylate, loperamide or codeine phosphate for severe infective gastroenteritis, i.e. bloody diarrhoea, high fever or severe systemic toxicity

PPI for peptic ulcer disease at full therapeutic dosage for > 8 weeks

Potentially inappropriate prescribing

Can be divided into:

- Overprescribing: the use of drugs where no clinical indication exists

- Misprescribing: the use of an indicated drug where the risks outweigh the benefits

- Underprescibing: the omission of clinically indicated medicines

Errors of commission

Errors of omission
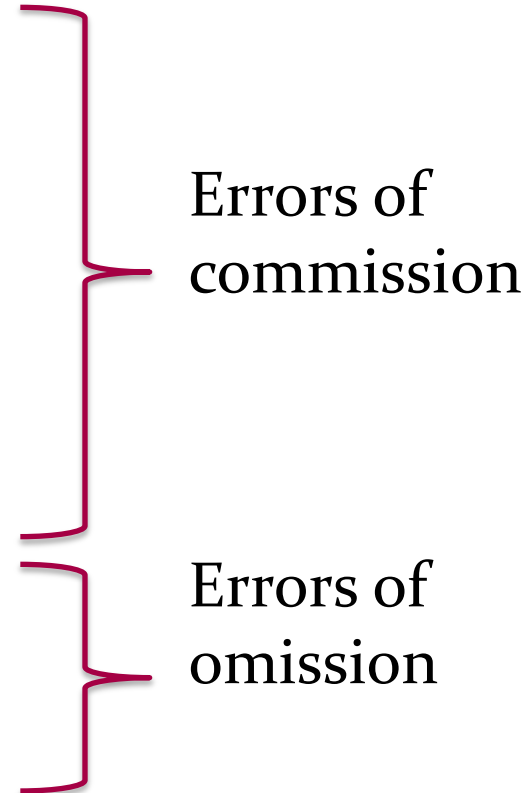
A couple of caveats

- <u>Potentially</u> inappropriate...
  - Alternative options may be exhausted
  - Rationale for prescribing may be clearly documented
- Heterogeneity of indicators
  - Aspirin with no history of coronary, cerebral or peripheral arterial symptoms or occlusive arterial event *(not indicated)*
  - Warfarin and NSAID together *(risk of gastrointestinal bleeding)*

PIP on the spectrum of medication errors

Low ⟵————————————————————⟶ High

Risk of an adverse event

Low ⟵————————————————————⟶ High

Severity of resulting harm

Impact of potentially inappropriate prescribing on patient safety

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Prevalence of PIP

- PIP is prevalent in the older population (> 70 years)
  - Ireland 36%
  - Northern Ireland 34%
  - United Kingdom 29%

- Most common types of PIP similar across jurisdictions (long term high dose PPIs)

Impact on patient safety

- Study of >900 older people aged 70 years and older found those with ≥2 PIP indicators[3]:
    - Were twice as likely to have an ADR
    - Had lower health related quality of life
    - Had almost twice the expected rate of A&E visits
- Study using data from The Irish Longitudinal Study on Ageing (TILDA) found:
    - Prescribing omissions also associated with increased rate of GP visits and hospital visits

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Is this preventable?

- Interventions have been effective in reducing PIP in primary care (OPTI-SCRIPT[4]) and secondary care
- Trial of medication screening using STOPP/START and recommendations to medical team in hospital reduced PIP[5]
  - Intervention group had lower prevalence of falls and all-cause mortality (not statistically significant)
  - Trend towards lower rate of GP visits after discharge

Available potentially inappropriate prescribing indicators

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Multitude of PIP indicators...

McLeod criteria (1997)

NORGEP criteria (2009)

STOPP/START (2008)

PRISCUS list (2010)

Beers criteria (2012)

Laroche criteria (2007)

Winit-Watjana criteria (2008)

Basger criteria (2008)

...which to choose??

Which to use?

- STOPP/START criteria
  - Developed in Ireland for use in European context

- Preventable drug-related morbidity indicators[6]
  - Focusing on the 30-80% of drug-related harm that may be preventable

- UK Prescribing safety indicators for general practice[7]

Not just about older patients

- Older population is one of most at risk cohorts

- Those with multimorbidity

- Middle-aged people (PROMPT criteria)

- Paediatric population

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No ideal set of indicators

- Clinically current, easy to use, flexible for use across settings and international boundaries

- Tailor selection to your organisation
  - Audit medication use and events
  - Consider prevalence and severity
  - Discuss with clinicians
  - Consider available data sources

Acknowledgements

My PhD supervisors Dr Caitriona Cahir, Dr Kathleen Bennett and Prof. Tom Fahey

Thank you, any questions?

References

[1] National Health Service. Medication Safety Thermometer – A preliminary guide.

[2] Donabedian A (1966) Evaluating the quality of medical care.

[3] Cahir C et al., (2014) Potentially inappropriate prescribing and adverse health outcomes in community dwelling older patients. *Br J Clin Pharmacol*

[4] Clyne B et al., (2013) Addressing potentially inappropriate prescribing in older patients: development and pilot study of an intervention in primary care (the OPTI-SCRIPT study). *BMC Health Serv Res.*

[5] Gallagher P et al., (2011) Prevention of potentially inappropriate prescribing for elderly patients: a randomized controlled trial using STOPP/START criteria. *Clin Pharmacol Ther.*

[6] MacKinnon N et al., (2002) Preventable drug-related morbidity in older adults 1. Indicator development. *J Manag Care Pharm.*

[7] Spencer R et al., (2014) Identification of an updated set of prescribing-safety indicators for GPs. *Br J Gen Pract.*

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