Appropriate and inappropriate polypharmacy-choosing the right strategy

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Use of medicines: a common intervention

“The use of medications in older patients is arguably the single most important health care intervention in the industrialized world.”

Avorn, JAMA 2010; 304: 1606-1607
Guidance on prescribing
Changing perspectives-the time span

A great deal of treatment that is given to the young and middle aged is intended to prevent troubles in the distant future and some nuisance on the present may be accepted to obtain this end. The rigid control of hypertension and diabetes are examples. It is, of course, obvious that old people have no distant future, yet they are often continued on treatment which, however correct, it might have been, can no longer benefit them.

BNF, 1976
Most elderly patients have poor memories and get confused. They may live alone or with a partner who is no better. They find it difficult to follow even simple instructions, and the complicated schedule sometimes offered, with many drugs to be taken at different times. They are creatures of habit and once they have been on tablets for a long time, it may be difficult or unkind to stop them.
Challenges and changing perspectives

• **Challenges of medication use in older people**
  - Altered pharmacokinetics/pharmacodynamics
  - Multimorbidity
  - Polypharmacy

• **Changing perspectives on polypharmacy**
  - Numbers?
  - Definitions?
Going beyond the numbers

• “The larger number of pharmaceuticals will always be an important component of the medical care of older Americans.”

“The concept of ‘appropriate polypharmacy’ recognises that patients can benefit from multiple medications…”


Getting the balance right between ‘many’ and ‘too many’ drugs
Going beyond the numbers

Commentary

Going beyond the numbers – a call to redefine polypharmacy

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Hughes et al, Br J Clin Pharmac 2014; 77: 915-916
Making the case

• Key finding
Appropriate management with several medicines prevented unplanned admissions

• Key conclusion
‘Assumptions that polypharmacy is always unsafe or harmful and that it is indicative of suboptimal care need to be reconsidered in the clinical context of the conditions for which those drugs are being prescribed’

Payne et al; Br J Clin Pharmac 2014; 77: 1073-1082
How do we move beyond the numbers to attain appropriate polypharmacy?

What’s the right strategy?

An intervention to improve prescribing of appropriate polypharmacy

Focusing on behaviour change
Medical Research Council Framework

Development
Evidence, theory, modelling

Feasibility and Piloting
Testing procedures, estimating recruitment, sample size

Implementation
Dissemination, surveillance and monitoring, long-term follow-up

Evaluation
Assessing effectiveness/cost-effectiveness, understanding change process
Underpinning evidence

- Intervention development lacked detailed description
- Evidence for effectiveness of identified interventions was weak
Approach to developing interventions

Series of systematic steps focusing on behaviour change

1. Specify target behaviour(s)-what needs to change
   - Prescribing of polypharmacy
2. Identify barriers to/facilitators of behaviour change
3. Consider how to change the target behaviour(s)
4. Implement an intervention that seeks to change the target behaviour(s)
5. Evaluate
Identification of barriers and facilitators - Theoretical Domains Framework (TDF)

12 theoretical domains relevant to changing healthcare professionals’ behaviour.

<table>
<thead>
<tr>
<th>Theoretical domains</th>
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<tbody>
<tr>
<td>Knowledge</td>
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<tr>
<td>Skills</td>
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<tr>
<td>Beliefs about capabilities</td>
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<tr>
<td>Emotion</td>
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<tr>
<td>Beliefs about consequences</td>
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<tr>
<td>Behavioural regulation</td>
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<tr>
<td>Motivation and goals</td>
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<tr>
<td>Social influences</td>
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<tr>
<td>Memory, attention and decision processes</td>
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<tr>
<td>Environmental context and resources</td>
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<tr>
<td>Social/professional role and identity</td>
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<tr>
<td>Nature of the behaviours</td>
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TDF-based interviews

• Interview guides developed based around the domains
  – Interviewed GPs about appropriate polypharmacy
  – Identified domains which are perceived to act as barriers to, and facilitators of, behaviour change

• Used to guide intervention design, based on changing target behaviour(s)

Cadogan et al., 2015; Implem Sci; 10: 161
Sample interview questions

**GPs**

**Knowledge**

“What knowledge do you have as a GP that would help you to make the necessary changes to ensure that patients receive appropriate polypharmacy as opposed to inappropriate polypharmacy?”

**Social/professional role and identity**

“What would you consider your responsibilities to be as a GP in ensuring that older patients receive appropriate polypharmacy?”
Key domains for prescribing appropriate polypharmacy

- Prescribing
  - Skills
  - Beliefs about capabilities
  - Beliefs about consequences
  - Environmental context and resources
  - Memory, attention and decision processes
  - Social/professional role
  - Social influences
  - Behavioural regulation

Cadogan et al., 2015; Implem Sci; 10: 161
Changing behaviour

• Target key **domains** as part of intervention using established **behaviour change techniques (BCTs)**
  – Can map from TDF domains to appropriate BCTs
• “An observable, replicable and irreducible component of an intervention designed to alter or redirect causal processes that regulate behaviour”
• BCTs are the basis of the intervention
  – ‘Active ingredients’
# Examples of BCTs

<table>
<thead>
<tr>
<th>BCT</th>
<th>Definition</th>
<th>Example</th>
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<tbody>
<tr>
<td>Goal-setting</td>
<td>Set or agree a goal defined in terms of the behaviour to be achieved</td>
<td>Set a goal with patients of taking all medicines as prescribed</td>
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<tr>
<td>Prompts and cues</td>
<td>Introduce or define environmental or social stimulus with the purpose of prompting or cueing the behaviour. The prompt or cue would normally occur at the time or place of performance</td>
<td>Place a Post-it® note on the door to remind patients to take medicines before leaving the house in the morning</td>
</tr>
<tr>
<td>Self-monitoring</td>
<td>Instruct self-recording of specified behaviour</td>
<td>Request patients to note each time they take their medicines in a diary</td>
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## Mapping TDF domains to BCTs

<table>
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<th>BCT</th>
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<tr>
<td>Skills</td>
<td>Behavioural rehearsal/practice</td>
</tr>
<tr>
<td>Beliefs about consequences</td>
<td>Self-monitoring</td>
</tr>
<tr>
<td>Environmental context and resources</td>
<td>Prompts and cues</td>
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Cane et al., 2015; *Br. J Health Psychology*; 20: 130-50
### BCTs embedded in the intervention

<table>
<thead>
<tr>
<th>Behaviour change technique</th>
<th>Example of how the behaviour change technique is being operationalised as part of the intervention</th>
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<tr>
<td>Action planning</td>
<td>GPs will plan to perform medication reviews on the specified date when patients meeting inclusion criteria present at the practice for a scheduled appointment.</td>
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<tr>
<td>Prompts/cues</td>
<td>GPs will be prompted by the receptionist/practice manager to perform medication reviews with older patients meeting inclusion criteria when patients present for a scheduled appointment.</td>
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<tr>
<td>Modelling or demonstrating of behaviour</td>
<td>GPs will be provided with a video demonstration of how to perform a medication review with an older patient who is receiving polypharmacy.</td>
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<td>Salience of consequences</td>
<td>As part of the video demonstration of how to perform a medication review, feedback will be included from the GP and ‘patient’ to emphasise the potentially positive consequences of performing the review.</td>
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Intervention components

1. A video demonstrating how general practitioners (GPs) can prescribe appropriate polypharmacy during a typical consultation with an older patient
2. A patient recall process (appointment with GP for a medication review)
3. GPs making explicit plans how to ensure target patients were prescribed appropriate polypharmacy
4. GPs receiving prompts from reception staff to carry out this plan when target patients arrived at the practice
Medical Research Council Framework

Feasibility and Piloting
Testing procedures, estimating recruitment, sample size

Development
Evidence, theory, modelling

Evaluation
Assessing effectiveness/cost-effectiveness, understanding change process

Implementation
Dissemination, surveillance and monitoring, long-term follow-up
Feasibility study

- Four GPs and ten patients were recruited from two practices in Northern Ireland
- The intervention was considered usable and acceptable by GPs
- Patients welcomed the opportunity to have their medications reviewed
- Patient feedback was positive
Medical Research Council Framework

Feasibility and Piloting
Testing procedures, estimating recruitment, sample size

Development
Evidence, theory, modelling

Evaluation
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Dissemination, surveillance and monitoring, long-term follow-up
PolyPrime

- A randomised pilot study of a theory-based intervention to improve appropriate polypharmacy in older people in primary care
- Funded under the CHITIN initiative: Cross-border Healthcare Intervention Trials in Ireland Network
Aim

- To undertake a pilot cluster RCT (cRCT) of a theory-based intervention targeting prescribing of appropriate polypharmacy in primary care (PolyPrime) to assess the feasibility of a definitive cRCT of the PolyPrime intervention
The Defined Area

- PolyPrime will operate within a clearly defined area including Northern Ireland and the border region of Ireland

Northern Ireland:
- Antrim
- Armagh
- Down
- Fermanagh
- Londonderry/Derry
- Tyrone

Republic of Ireland:
- Cavan
- Donegal
- Leitrim
- Louth
- Monaghan
- Sligo
Overview of PolyPrime

- 12 GP practices recruited from the Defined Area
  - 10 patients per practice recruited
  - Practices randomised to intervention or control
- Video will be made available to intervention practices on a secure platform
- Eligible patients invited to attend the practice on two occasions for review
- Data collection at baseline, 6 and 12 months
  - Medication appropriateness, health-related quality of life and cost analysis
  - Process evaluation
Reflections on this strategy

• A systematic approach to intervention development

• Detailed, thorough, exhaustive

• Time-consuming
  – Balance between rigour and practical approach

• Important question
  – Will this strategy lead to a more effective intervention?
Developing a strategy to reduce harm

- John Snow 1813-1858
- A founding father of epidemiology
- Link between contaminated water and cholera outbreak in London
Development of the intervention

• Recognised the problem and posed a theory
• Systematically collected and analysed the data
  – Interviews, mapping cases to affected areas, identified barriers and facilitators to infection
• Came to a conclusion and “respectfully requested an interview” with the Board of Governors of St. James’ Parish in London
  – Proposed an intervention
Mapping from TDF to BCT to an intervention component

• TDF domain-
  Environmental context and resources

• BCT-restructuring the physical environment OR avoidance of exposure to cues for the behaviour

• Operationalise the BCT
  – Removal of the handle from the Broad Street water pump
Acknowledgements

• Colleagues at QUB, TCD, RCSI, City University of London, NUI Galway and University of Auckland
• The Dunhill Medical Trust
• Health Research Board, Ireland, HSC R and D, Interreg
• Northern Ireland Clinical Research Network
• Northern Ireland Clinical Trials Unit