Practical examples - Addressing medication safety in polypharmacy at the organizational level

Gaston Perman
Director of Public Health Department at Hospital Italiano de Buenos Aires’ University

Buenos Aires, Argentina

12 April 2022
Lessons learned from two decades of work on medication safety

Prof. Gastón Perman
gaston.permam@hospitalitaliano.org.ar
Context

3,000,000 outpatient visits/year
50,000 inpatient admissions/year
A multifactorial intervention to lower potentially inappropriate medication use in older adults in Argentina

Marcelo Schapira¹ · Pablo Calabró¹ · Manuel Montero-Odasso²,³,⁴,© · Abdelhady Osman³,⁴,© · María Elena Guajardo¹ · Bernardo Martínez¹ · Javier Pollán¹,⁵ · Luis Cámara¹ · Miguel Sassano¹ · Gastón Perman¹,⁵,©

Received: 13 January 2020 / Accepted: 27 April 2020 © Springer Nature Switzerland AG 2020

Abstract

Background Adverse drug reactions are a common cause of potentially avoidable harm, particularly in older adults.
Aims To evaluate the feasibility and efficacy of a pilot multifactorial intervention to reduce potentially inappropriate medication (PIM) use in older adults.
Methods We conducted a phase 2, feasibility, open-label study in the ambulatory setting of an integrated healthcare network in Buenos Aires, Argentina. We recruited primary care physicians (PCPs) and measured PIM use in a sample of their patients (65 years or older). Educational workshops for PCPs were organized with the involvement of clinician champions. Practical deprescribing algorithms were designed based on Beers criteria. Automatic email alerts based on specific PIMs recorded in each patient’s electronic health record were used as a reminder tool. PCPs were responsible for deprescribing decisions. We randomly sampled 879 patients taking PIMs from eight of the most commonly used drug classes at our institution and compared basal (6 months prior to the intervention) and final (12 months after) prevalence of PIM use using a test of proportions.
Results There was a significant reduction ($p < 0.05$) in all drug classes evaluated. Non-Steroidal Anti-Inflammatory Drugs (basal prevalence 5.92%; final 1.59%); benzodiazepines (10.13%; 6.94%); histamine antagonists (7.74%; 3.07%); opioids (2.16%; 1.25%); tricyclic antidepressants (8.08%; 4.10%); muscle relaxants (7.74%; 3.41%), anti-hypertensives (3.53%; 1.82%) and oxybutynin (2.96%; 1.82%). The absolute reduction in the overall prevalence was 8.5 percentage points (relative reduction of 51.4%).
Conclusion This multifactorial intervention is feasible and effective in reducing the use of potentially inappropriate medication in all drug classes evaluated.
OPIOIDS
- Propoxyphene
- Meperidine

Are these appropriate in elders?

NO
According to Beers criteria, irrespective of diagnosis.

Propoxyphene
Why not?
- It has an active metabolite, Norpropoxyphene: cardotoxic, proarrhythogenic, and might cause seizures or tremors. In addition, it can cause dizziness, ataxia, sedation and constipation. Therapeutic effect similar to acetaminophen.

Are there alternatives?
Yes
Acetaminophen: 1,000 mg tid or qid.
Ibuprofen: 200-1,600 mg daily, for no longer than 5 days.
Tramadol: 50-100 mg tid or qid.
Codeine + Acetaminophen: 30 mg – 60 mg codeine tid or qid.
Morphine: 15-30 mg q 4 hs.

Meperidine
Why not?
- It has an active metabolite, Noreperidene: it can cause seizures. Ineffective when used orally. Adverse effects: sedation, confusion, increased risk of falls.

Are there alternatives?
Yes
<table>
<thead>
<tr>
<th>Drug class</th>
<th>Baseline value n (%)</th>
<th>Final value n (%)</th>
<th>Relative reduction (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSAIDs</td>
<td>52 (5.92%)</td>
<td>14 (1.59%)</td>
<td>73.08</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Tricyclic Anti-depressants</td>
<td>71 (8.08%)</td>
<td>36 (4.10%)</td>
<td>49.30</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Anti-H1</td>
<td>68 (7.74%)</td>
<td>27 (3.07%)</td>
<td>60.29</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Anti-hypertensives</td>
<td>31 (3.53%)</td>
<td>16 (1.82%)</td>
<td>48.39</td>
<td>0.002</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>89 (10.13%)</td>
<td>61 (6.94%)</td>
<td>31.46</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Opioids</td>
<td>19 (2.16%)</td>
<td>11 (1.25%)</td>
<td>42.11</td>
<td>0.013</td>
</tr>
<tr>
<td>Oxybutynin</td>
<td>26 (2.96%)</td>
<td>16 (1.82%)</td>
<td>38.46</td>
<td>0.008</td>
</tr>
<tr>
<td>Muscle Relaxants</td>
<td>68 (7.74%)</td>
<td>30 (3.41%)</td>
<td>55.88</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*NSAIDs* non-steroidal anti-inflammatory drugs, *anti-H1* Histamine 1 receptor antagonist

*According to Beers criteria recommendations.*

**Fig. 2** Run chart of percentage of participants taking at least one potentially inappropriate medication through time.
Acreditado en calidad y seguridad por la Joint Commission International
### Mecanismos de Acción

#### Warfarina
- **Familia:** Anticoagulantes
- **Acción terapéutica:** Antitrombotico
- **Riesgo teratogénico:** 0
- **Riesgo lactancia:** 1

#### Omeprazol
- **Familia:** 
- **Acción terapéutica:** 
- **Riesgo teratogénico:** C
- **Riesgo lactancia:** 2

### Detalle de las INTERACCIONES

<table>
<thead>
<tr>
<th>PARACETAMOL 500.0 MG, COMPRIMIDO, ORAL</th>
<th>FEHITOINA 100.0 MG, COMPRIMIDO, ORAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PARACETAMOL</strong></td>
<td><strong>FEHITOINA</strong></td>
</tr>
<tr>
<td><strong>Significancia Clínica: Moderada (2)</strong></td>
<td></td>
</tr>
<tr>
<td>El uso concomitante de Paracetamol y Fentoina podría resultar en un aumento del clearance de Paracetamol. Éste podría producir depilación de los depósitos de glutatión, conduciendo a potencial toxicidad por Paracetamol. No se requieren precauciones especiales; sin embargo, los pacientes presentarían un mayor riesgo de desarrollar hepatotoxicidad en presencia de sobredosis por Paracetamol. El tratamiento de la intoxicación por Paracetamol en pacientes recibiendo fentoina debería ser modificado.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TACROLIMUS 5.0 MG, AMPOLLA, INTRAVENOSA</th>
<th>SILDENAFIL 50.0 MG, COMPRIMIDO, ORAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TACROLIMUS</strong></td>
<td><strong>SILDENAFIL</strong></td>
</tr>
<tr>
<td><strong>Significancia Clínica: Moderada (2)</strong></td>
<td></td>
</tr>
<tr>
<td>El Tacrolimus podría aumentar los niveles del Sildenafil y su metabolito activo el N-desmetil-sildenafil. Los pacientes deben ser monitoreados por disminución de la presión sanguínea y otros efectos dados por el Sildenafil cuando se administra junto al Tacrolimus. Una dosis de comienzo de 25mg de Sildenafil podría ser considerada.</td>
<td></td>
</tr>
</tbody>
</table>

**Más Información**
Evolution of the safety culture
Local adaptation of the Beers criteria
Educational and awareness-raising interventions for general practitioners, patients and families
Customised interventions based on electronic screening of PIM cases and alert generation
NUEVA HERRAMIENTA EN LA HISTORIA CLÍNICA ELECTRÓNICA
MAPA DE RECURSOS SALUDABLES

¿CÓMO ACCEDER?

Una vez en el mapa, colocar el nombre del barrio en el buscador de color rojo. Otra opción es hacer zoom en el mapa, en la zona de interés y ver todos los recursos disponibles.
<table>
<thead>
<tr>
<th></th>
<th>PRE intervention n 60,772</th>
<th>POST Intervention n 60,070</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIM % (n)</td>
<td>50.0% (30,409)</td>
<td><strong>43.5%</strong> (26,139)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Lessons learned (helpful in most contexts)

• (For contexts where there is no strong governance) Start with clinical champions that lead the way (bottom-up approach)

• Involve all stakeholders early. Multifactorial interventions maximise chances of success

• Take advantage of windows of opportunity. Top down initiative combined with distributed leadership

• Work on cultural change

• Monitor progress and adapt as needed

• Focus on continuous improvement, feedback and non-punitive reactions to problems encountered
Lessons learned (helpful in most contexts)

• Build on knowledge gained so far for scaling up
• Always adapt interventions to local context and available resources
• Adopt an integral or systemic approach (avoid overmedicalisation). Leverage on community resources and participation
• Always consider sustainability. Lean on strong team and clear aims when funding is limited or temporarily discontinued
Thank you very much

gaston.perman@hospitalitaliano.org.ar

PROPAM Team:
Calabró Pablo; Schapira Marcelo; Perman Gastón; Terrasa Sergio; Mozeluk Natalia; Giber Fabiana; Spina Silvia, Marco
Maria Agustina; Bendelman Gisela; Donnianni Ileana; Bellomo Maria Jose; Cristina Elizoldo; Belén Outumuro; Valeria
Abellan; Leila Garipe; Hernan Pátiño Chaumiel; Daniel Weissbrod; Eduardo Stonski; Maria Elena Guajardo; Maria Elvira
Soderlund; Marina Giusti; Sabelli Lavinia.

JCI Accreditation team (medication safety):
Michelangelo Hernán, Mansilla Adriana, Silveira Martín, Matejic Patricia, Villalba Elsa, Cáceres Nora, Pollán Javier, and all
healthcare professionals from HIBA.

Health promotion team:
Pace Natalia, Garipe Leila, Cané Ludmila, Galarza Carlos, Somoza Federico, Guani Liliana.