A Patient-Centered Prescription Model assessing
the appropriateness of chronic drug therapy in older patients

When does polypharmacy mean overtreatment?
- To identify potentially inappropriate prescribing (IP) in a group of older patients

- and to optimize prescription **according to care goals** of each patient through a model which combines both the clinical judgement and the scientific evidence in a pragmatic and systematic approach.
We developed three descriptive observational studies:
- two studies in an Acute Care Elderly (ACE) Unit
- and one in a nursing home (NH).

- Variables collected for the analysis:
  - age
  - sex
  - admitting diagnosis
  - medication information:
    - number of drugs at admission
    - inappropriate prescription (IP)
    - and end-of-life (EOL) status (last months or year of life).

- Each patient’s pharmacotherapeutic plan was assessed through application of the Patient-Centered Prescription (PCP) Model.
This is a systematic three-step process carried out by a geriatrician and a clinical pharmacist.

1. **Patient-centered assessment**
   - Care goal of each patient (survival, maintaining function or symptomatic control)
   - Shared decisions
   - Adherence

2. **Diagnosis-centered assessment**
   - List patient health problems-drug-objective
   - Evaluate applicability of CPG according to patient's care goal.

3. **Drug-centered assessment**
   - Assess drugs with high iatrogenic risk
   - Assess interactions, duplications, adjust dose to renal and hepatic function

**Individidualized therapeutical plan**
General data

<table>
<thead>
<tr>
<th></th>
<th>ACE(^1)</th>
<th>NH(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>382</td>
<td>110</td>
</tr>
<tr>
<td>Average age</td>
<td>86.7</td>
<td>86.4</td>
</tr>
<tr>
<td>Criteria for End-Of-Life (EOL)</td>
<td>30%</td>
<td>60%</td>
</tr>
</tbody>
</table>

1. - Acute Care Elderly  
2. - Nursing Home
### Results: comparison between ACE and NH

#### Pharmacological data

<table>
<thead>
<tr>
<th></th>
<th>ACE</th>
<th>NH</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average prescribed drugs</td>
<td>7.16</td>
<td>10.37</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Polypharmacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Excessive Polypharmacy (EP)</td>
<td>80%</td>
<td>95.5%</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>20%</td>
<td>56.4%</td>
<td></td>
</tr>
<tr>
<td>Patients with at least one IP</td>
<td>39.8%</td>
<td>92.7%</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>EOL / non-EOL patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• No differences EOL vs. non-EOL in Polypharmacy and average drugs: p&gt;0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• <strong>Differences EOL vs. non-EOL in IP: p&lt;0.05</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.- Acute Care Elderly
2.- Nursing Home
Can PCP Model improve health outcomes? Admission vs. discharge in ACE

- During admission drug therapy regimens were modified in 93.44% of cases with IP in ACE Unit.

- Patients with advanced dementia:

<table>
<thead>
<tr>
<th></th>
<th>At admission</th>
<th>One month after discharge</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average prescribed drugs</td>
<td>7.27</td>
<td>4.82</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Polypharmacy prevalence</td>
<td>82.2%</td>
<td>45.2%</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Excessive Polipharmacy</td>
<td>20.5%</td>
<td>1.36%</td>
<td></td>
</tr>
<tr>
<td>“Oligopharmacy” prevalence</td>
<td>26%</td>
<td>63%</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

Drugs according to target

Before admission
- Preventive 24.8%
- Etiological 42.9%
- Symptomatic 32.2%

One month after discharge
- Preventive 12.6%
- Etiological 47.1%
- Symptomatic 40.2%

Relationship between polypharmacy and ADE

- Positive correlation between number of drugs and ADE incidence (p<0.05):

<table>
<thead>
<tr>
<th>Number of daily drugs</th>
<th>% ADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>7.35</td>
</tr>
<tr>
<td>5-9</td>
<td>18.1</td>
</tr>
<tr>
<td>10 or more</td>
<td>28.6</td>
</tr>
</tbody>
</table>

- Inappropriate prescription was identified as a risk factor to suffer an ADE (37.7% vs 5.35% (p<0.001)).
- Patients in NH present more polypharmacy and more indication of at least one IP (p<0.001).

- EOL patients present more frequently a potential indication of at least one IP.

- The PCP Model is a framework that helps minimizing IP in a high-risk group older patients through a suitable approach to individualize pharmacotherapy:
  - During admission drug therapy regimens were modified in 93.44% of cases with IP in ACE
  - Prevalence of polypharmacy decreased significantly, to almost half. And the prevalence of EOL patients with ≥10 drugs decreased 20.5% to 1.3%.
Thank you
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