干预改进对老年VIP患者的口服药物处方的适宜性
在JCI认证过程中的旅程

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Dear editor

我们有兴趣阅读Fadare等人的研究结果，他们评估了尼日利亚老年患者的用药习惯，并得出结论，尼日利亚的多药滥用和不适当的处方是主要的治疗问题，需要对开药者进行培训和再培训，尤其是针对老年患者。

我们完全同意Fadare等人的观点，即低比例的不适当处方药物强调了信息技术在药事管理中的重要性。我们将在下文讨论并分享我们的观点。

老年患者可能患有多种慢性疾病，并且比年轻患者服用的药物更多。药物治疗管理（MTM）服务提供药物方案的详细审查，并且越来越被认可为对患者安全、改善健康结果和节省成本有利。毫无疑问，老年患者尤其需要MTM服务。²

国际联合委员会（JCI）认证的标准对合理用药有严格的要求。不合理用药包括药物的不适当、剂量、频率和给药途径，实际或潜在的药物相互作用（DDIs）、过敏反应、治疗重复和违背组织用药标准。

我们的调查表明，不合理用药仍然是国际上的主要问题。我们的医院在2013年2月24日顺利通过JCI认证，并成为全球第一所通过JCI认证的学术医疗中心医院。最近，我们随机评估了我们医院老年VIP病房的医生处方在通过JCI认证前后的情况，以便说明临床干预措施在JCI认证过程中的有效性。

结果表明，通过JCI认证前后的药物相关问题（DRPs）比例显著下降，从13.0%（通过JCI认证前）下降到3.5%（通过JCI认证后）（P<0.01）。五个指标的统计显著性变化（下降）表明，DDIs与潜在不良后果、治疗重复或组合使用两药物同一药物治疗或结构相似的药物，不适当给药时间、给药频率和给药途径。

表1是Fadare等人指出的DDIs，具有潜在不良后果。

我们随机评估了我们医院老年VIP病房的医生处方在通过JCI认证前后的情况，以便说明临床干预措施在JCI认证过程中的有效性。老年患者信息和药事管理的指标在表1中呈现。

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were detected after JCI accreditation. Geriatric patients in our study received an average of 12.6 drugs daily, before JCI accreditation and about 75% patients received more than 10 drugs, which obviously differs to the data from the study by Fadare et al.\(^1\) where an average of 3.8 drugs were given to an elderly patient and 29.5% of patients were prescribed \(\geq 5\) drugs. The difference in mean age between the two studies may explain the difference in number of drugs prescribed for geriatric patients (72.8 years ± 7.2 years versus 83.5 years ± 5.8 years). Geriatric patients aged over 80 years are classified as super-elderly patients. A relationship between increasing age and an increased number of medications seems to be explained by the prevalence of chronic conditions seen in the elderly population (average ten diagnoses per person).

We did not find the association between the increasing number of medications and higher risk for inpatients with DRPs \((P > 0.05)\), similar with the finding of Koh et al.\(^4\) As indicated in the study by Fadare et al.\(^1\), 25.5% of the patients suffered at least one potentially DRP. The very low proportion of patients with DRPs (3.5%) in our hospital after JCI accreditation may be owing to successful clinical interventions during the journey to JCI accreditation.

In the beginning of 2012, the president of our hospital (The Second Affiliated Hospital of Zhejiang University School of Medicine) decided to lead us in preparation for JCI accreditation. An online embedded software for prescription screening was already installed, but it embedded software for prescription screening, but the software did not perform well due to lack of update on an appropriate schedule. Although unit-dose dispensing service (UDDS) towards oral or intravenous medications has been achieved by pharmacists, prospective prescription auditing in accordance with JCI requirements still has not yet been fulfilled due to design defects in the hospital information system (HIS) and electronic medical record (EMR). Pharmacists only knew patient name, identification number, age, diagnosis, medication name, dose, administration route, and dose frequency, with the aid of the interface of the pharmacy management information system. Pharmacists could not know the patients’ other key information (eg, allergy history, body weight,

### Table 1 Geriatric patients information and indicators of rational drug use

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Before JCI accreditation (April 1, 2012)</th>
<th>After JCI accreditation (April 1, 2013)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients receiving oral medications</td>
<td>36</td>
<td>42</td>
</tr>
<tr>
<td>Male</td>
<td>27</td>
<td>36</td>
</tr>
<tr>
<td>Female</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Age (years) (mean ± SD)</td>
<td>83.5 ± 5.8</td>
<td>82.5 ± 8.7</td>
</tr>
<tr>
<td>Number of oral medications per patient (mean ± SD)</td>
<td>12.6 ± 5.8</td>
<td>12.8 ± 6.1</td>
</tr>
<tr>
<td>Number of patients receiving oral medications ≥20</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>10–19</td>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td>&lt;10</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Number of diagnoses (mean ± SD)</td>
<td>10.5 ± 3.5</td>
<td>9.2 ± 4.1</td>
</tr>
<tr>
<td>Number of patients with allergy history</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Number of physician orders for oral medications</td>
<td>486</td>
<td>601</td>
</tr>
<tr>
<td>Percentage of use of generic names</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Number of drug-related problems (DRPs)</td>
<td>63</td>
<td>21</td>
</tr>
<tr>
<td>Proportion of DRPs(^a)</td>
<td>13.0%</td>
<td>3.5%</td>
</tr>
</tbody>
</table>

#### Detailed information for DRPs

- Drug–drug interactions (DDIs) with potential adverse consequences\(^a\): 7, 0
- Therapeutic duplication or combination use of two drugs within the same therapeutic or structurally similar class\(^a\): 10, 4
- Lack of therapeutic drug monitoring: 8, 5
- Inappropriate dosing time\(^a\): 12, 5
- Inappropriate dosing frequency\(^a\): 14, 5
- Inappropriate dosing route\(^a\): 10, 1
- Too large a dose: 2, 1
- Beyond approved indications: 2, 0
- Proportion of combination use of gastrointestinal protective medications for patients taking aspirin: 50.0% (4/8), 77.8% (7/9)

Notes: \(^a\)Proportion of DRPs = number of DRPs divided by number of physician orders for oral medications.

Abbreviation: SD, standard deviation.

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body surface area, nutrition status, and clinical laboratory test results such as hepatic and renal function, international normalized ratio, blood routine examination, and serum drug levels), and current medications information.

A typical medication error occurred with a super-elderly patient on April 1, 2012 due to absence of appropriateness review toward current medications. The patient received concurrent therapy with valproate sustained-release tablet and intravenous (IV) meropenem. Comedicated meropenem can significantly decrease the plasma concentrations of valproate and thus result in antiepileptic treatment failure. Prescribing information about IV meropenem requires that the drug is contraindicated for patients taking valproate. Routine prospective prescription auditing of IV physician orders have been conducted by pharmacists from the Center of Pharmacy Intravenous Admixture Service (PIVAS), however, they only checked the appropriateness of IV medications and did not know the oral medications prescribed to the patient. Indeed, if pharmacists knew all current medications, they could perform clinical management, including therapeutic drug monitoring of serum valproate concentration when concurrent therapy with valproate and meropenem is not avoidable, or therapeutic switch from meropenem to imipenem/cilastatin sodium.

We followed the Koh et al approach that advocated applying the 20/80 principle in business management into clinical risk management to minimize or prevent most of the DRPs related with the small percentage of high risk patients (eg, geriatric patients). A PDCA (Plan-Do-Check-Act) cycle was used for continuous quality improvement. A pharmacist-led multi-disciplinary team, containing Division of Medical Affairs, Division of Nursing, Office of Medical Quality Management, Information Technology center, was established. We tried to improve the interface of the pharmacy management information system for prescription auditing, and strengthen training for physicians with lectures, which provided key opportunities for physicians to learn about the topics of MTM, DDIs, medication errors, adverse drug reactions, pharmacotherapeutic monitoring, and typical cases of irrational physician orders. Patient-oriented tracing methodology was also applied. Through 10 months of team cooperation and effort, a sophisticated interface for the pharmacy management information system for prescription auditing was successfully established. Since the integration of the audit system, competent pharmacists review each prescription newly prescribed, or when the dosage or other factors change, for appropriateness. When questions arise, the individual who prescribed the medication must be contacted. Communication now runs smoothly among pharmacists, nurses, and physicians.

Pharmaceutical care service is capable of reducing DRPs. Interventions to improve rational polypharmacy in our hospital also appear beneficial in terms of reducing inappropriate prescribing and DRPs. Our experience in clinical interventions during the journey to JCI accreditation strongly suggests that JCI accreditation helps to improve medical quality and patient safety in health care organizations.

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Disclosure

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References


