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# Relevant activity and performance indicator for pharmacy compounding: Benchmarking for two oncology drugs compounding pharmacy laboratories<sup>☆</sup>

Détermination d'un indicateur d'activité pertinent pour les préparations en pharmacie hospitalière : comparaison inter-établissements de la préparation des chimiothérapies

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## Summary

**Introduction.** The assessment of preparation activity in hospital pharmacy is validated according to the number of units produced per unit of time. This may not be the most relevant indicator of activity given the wide variations in the type of preparation, the number of steps required, and the complexity of manipulations. The aim of this research was to establish an activity indicator (AI) that incorporates the quantitative and qualitative aspects of preparations.

**Materials and methods.** Four pharmacists from three different countries developed a scoring grid to calculate an AI expressed in points, and it was applied to validate preparation activity for anticancer drugs in two healthcare establishments during one year.

**Results.** The scoring grid was useful to validate preparations, whether they were sterile or not, compounded or hospital preparations. After scoring 38 193 preparations, the difference in activity between these two establishments illustrated by current AI (16 960 versus 21 233 preparations, +25%) was halved using the grid (263 265 versus 298 949 points, +14%).

**Discussion.** This easy-to-use tool can be used to calculate an AI that takes into account the technical complexity of preparations.

## Résumé

**Introduction.** L'activité de préparation en pharmacie hospitalière est valorisée en fonction du nombre d'unités produites par unité de temps. Ce n'est peut-être pas l'indicateur d'activité le plus pertinent compte tenu de la grande variabilité en termes de types de préparation, d'étapes nécessaires, de la complexité des manipulations. Notre objectif a donc été d'élaborer un indicateur d'activité intégrant les aspects quantitatifs et qualitatifs des préparations.

**Matériels et méthodes.** Une grille de cotation a été élaborée par quatre pharmaciens de trois pays différents. Cette grille, qui permet de calculer un indicateur d'activité exprimé en points, a été mise en application pour mesurer l'activité de préparation des chimiothérapies de deux établissements de santé pendant un an.

**Résultats.** La grille permet de valoriser les préparations stériles ou non stériles, magistrales ou hospitalières. Après cotation de 38 193 préparations, l'écart d'activité entre les deux établissements illustré par l'indicateur d'activité actuel (16 960 versus 21 233 préparations, +25 %) est réduit de moitié (263 265 versus 298 949 points, +14 %).

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**Conclusion.** Such an indicator may provide a reliable tool to measure the development of the pharmacotechnical activity and to establish comparisons with other establishments regarding human and financial management.

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**Keywords:** Activity indicator, Chemotherapy, Preparation, Compounding, Pharmacotechnical, Valorisation, Healthcare, Benchmarking, Packaging

Pharmacotechnical units of hospital pharmacies prepare products that are not commercially available in anticipation of a practitioner's order. Generally, validation of global activity of preparation in hospital pharmacy (bulk compounding, pharmacotechnical activity) is carried out according to the number of units produced per unit of time. Given the extraordinary variability in terms of types of preparation, the steps required, the complexity of handling, and the number of units produced per unit of time is perhaps not the most pertinent activity indicator (AI).

The aim of this work is to draft and validate an AI integrating the quantitative, technical, and time factors of preparations to obtain an objective valuation of the activity in pharmaceutical technology. Such an indicator may provide a reliable tool to measure the development of the activity and to establish comparisons with other establishments regarding human and financial management of a pharmacotechnical unit.

The AI was used to measure the activity of preparation of anticancer medicine of two different healthcare settings: one for university hospital and the other one for regional cancer treatment center.

## Materials and methods

The methodology adopted for the elaboration of the indicator of activity was a healthcare failure mode and effect analysis technique (FMEA), and their criticality [1,2].

### Workgroup

A group of four hospital senior pharmacists with extensive specific knowledge to this area of activity from three different European countries (Belgium, France, Switzerland) and four different establishments of health was constituted. In each establishment, the reflections were led within a working subgroup of hospital pharmacy technicians.

### Brainstorming

Elaboration of the AI consisted of the review of all the stages of the bulk compounding process. They were

included in two scoring grids according to the type of preparation, sterile or not, then ranked according to their nature (e.g., stages connected to the compounding, reconstitution, packaging) in the order which they appear in the process. The French pharmacists submitted all the items of the grids related to quality controls for expertise and validation by the group.

**Conclusion.** L'intérêt de cet outil est de permettre les comparaisons inter-établissements et de suivre l'évolution de l'activité intrahospitalière.

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**Mots clés :** Indicateur d'activité, Pharmacotechnie, Chimiothérapie, Préparation, Pharmacotechnie, Valorisation, Benchmarking, Conditionnement, Anticancéreux

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### Scoring

Each of the stages of the preparation was then associated with an elementary score. The elementary score is a numerical value associated with a variability criterion, weighed according to the difficulty and time required for the completion of that stage. The elementary scores chosen varied from 1 to 5 points: 1 point being the lowest score, attributed to the simplest stage, and 5 points the strongest score, attributed to the most complex and/or the most very time-consuming stage. Then, intermediate or equivalent scores were attributed to each kind of stages.

### Preparation indicator

Since one preparation is constituted by multiple stages, the sum of elementary scores provides a specific global score for each pharmaceutical preparation called preparation indicator (PI). The PI is given by the following equation:

$$PI_i = \sum_{j=1}^{N_i} S_{ij}$$

where  $PI_i$ : indicator for the preparation  $i$  (in points).

$N_i$ : number of stages of the manufacturing process for the preparation  $i$ .

$S_{ij}$ : elementary score corresponding to the stage number  $j$  of the preparation  $i$ .

A score can be used several times for the same preparation to repeat the same action. For example, if the process of preparation requires three weightings (those of the active ingredient and two excipients), 3 points can be attributed to the stage of weighting in this preparation because the weighting stage is scored 1 point.

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