



## Editorial

## Clinical Audit: Why, Where and How? ☆



## La auditoría clínica y su circunstancia

Francisco Pozo-Rodríguez,<sup>a</sup> Ady A. Castro-Acosta,<sup>b,\*</sup> Carlos J. Álvarez-Martínez<sup>c</sup><sup>a</sup> Instituto de Investigación, Hospital Universitario Doce de Octubre, Madrid, Spain<sup>b</sup> Centro de Investigación Biomédica en Red de Enfermedades Respiratorias (CIBERES/CIBER-ISCIII), Instituto de Investigación, Hospital Universitario Doce de Octubre, Madrid, Spain<sup>c</sup> Servicio de Neumología, Instituto de Investigación, Hospital Universitario Doce de Octubre, Centro de Investigación Biomédica en Red de Enfermedades Respiratorias (CIBERES/CIBER-ISCIII), Madrid, Spain

Clinical audit (CA) is a “quality improvement process that seeks to improve patient care and outcomes through systematic review of care and the implementation of change”.<sup>1</sup> This definition comprises 2 elements: measuring performance and taking corrective action. To measure performance, (i) a systematic diagnosis of the clinical practice in terms of structure, processes and outcomes must be made, which (ii) must be measured against internal and external quality criteria, and (iii) necessary changes must be identified. Corrective action involves (iv) the implementation of the necessary changes, and (v) evaluation of the outcomes of such changes.

In the United Kingdom, CAs come under National Health Service clinical governance, but external organizations are also involved: the National COPD Audit Program is a joint initiative involving the Royal College of Physicians, the British Thoracic Society, and the Primary Care Respiratory Society, in collaboration with the British Lung Foundation.<sup>2</sup> In Spain, CAs are not specifically included in the organization charts or mission statements of the Health Service or other scientific societies or professional colleges, but some initiatives have been introduced in recent years.

AUDIPOC Spain (129 hospitals, 5128 cases) is an audit carried out in Spain on the standard of care in exacerbations of chronic obstructive pulmonary disease (ECOPD) between 2008 and 2009.<sup>3–5</sup> The 2011 ERS COPD (13 countries, 432 hospitals, 16,081 cases) is an ERS-sponsored European audit of the standard of care in ECOPD, co-led by Spain.<sup>6–8</sup> The MAG-1 study, reported in this issue of *Archivos de Bronconeumología*, is a clinical audit of ECOPD performed in 30 hospitals and 910 cases in Catalonia at the beginning of 2011.<sup>9</sup> Catalonia also participated in the AUDIPOC (10 hospitals, 404 cases) and the ERS Audit (9 hospitals, 475 cases). These 3 studies, being performed at the same time, in the same geographical region, and using similar methodologies, are good candidates for a comparative assessment.

A common limitation of the MAG-1, AUDIPOC and ERS COPD Audit studies is that the databases were constructed from clinical records, and the frequency of missing or extremely improbable data is high. All 3 audits identify weak points in the care process, and report wide variability in terms of hospital and patient characteristics and outcomes. MAG-1 manages variability by grouping hospitals by the number of COPD admissions per year, while ERS COPD categorizes centers by number of beds. Both identified significant differences between the various categories, which could be often attributed to a logical clinical factor. AUDIPOC deals with variations in mortality and readmission using a multilevel multivariate analysis adjusted for size, number of cases enrolled and number of discharges. This analysis revealed one or more underlying hospital-specific factors (hospital-clustering effect) that influence outcomes in a unique and independent manner and affect a significant proportion of inter-hospital variability.<sup>10</sup>

Dissimilarities are also observed. The results of MAG-1, AUDIPOC and ERS in Catalonia reveal differences in the mean values of a number of clinical variables, e.g., percentage of active smokers (10%, 26% and 25%), overall mortality (12%, 7% and 8%) or readmission (49%, 37% and 40%). These findings merit further study.

To identify outcome-associated variables, MAG-1 used multivariate linear and logistic regression models: a small number of variables were maintained, mostly related with the personal characteristics or clinical status of the patients. These outcomes were echoed in the AUDIPOC model: after adjusting for the cluster effect, some variables associated with patient age and clinical status were maintained. The analyses of the ERS COPD Audit are complex and have yet to be published, but they seem to point in the same direction.

In the clinical audit setting, the geographical region in which the audit is performed, the emphasis on the intervention component, the nature of data used, and other aspects, are all influencing factors.

The 3 audits studied were conducted in hospitals on a regional, national and international level. In our opinion, the wider the net, the more complicated the study, with the ensuing problems of less stable databases, more complex analyses, and more difficulties in pinpointing specific weakness in hospital care provisions,

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\* Corresponding author.

E-mail address: [ady@h12o.es](mailto:ady@h12o.es) (A.A. Castro-Acosta).

which is where the corrective action will finally need to be applied. AUDIPOC alerted us to the hospital-clustering effect, composed of both hospital-centered elements (structural and organizational details or clinical practice styles not reflected in the variables under study, and which are difficult to verify), and non-hospital-centered elements (socioeconomic makeup of the hospital's catchment area, healthiness of the environment, access to health services and the trickle-down effect on hospital admission, to cite only a few). The advantage of multi-hospital studies is that they measure performance in different settings and, in theory, identify the actions that need to be taken at various healthcare levels.

All 3 audits place emphasis on the measurement of performance, a situation diagnosis that is clearly necessary and probably essential. However, corrective actions are relegated to second place, whereas these are in fact the ultimate reason for clinical audits, and are most effective when applied directly in the hospital. Moreover, external agents will have a hard job overcoming obstacles to implement actions in the hospital, despite the auditors' best efforts.

All 3 audits use data retrieved from clinical records by different staff members. The diversity of the clinical records that are collected in our health system, irregular data completion, and probable discrepancies in the thoroughness of the data extractors suggests that variability in the results due to clinical record artifacts should be taken into consideration.

To sum up, we believe that CAs are essential tools for improving healthcare quality, and that stakeholders in the healthcare system must support their use. CAs must be implemented to scrutinize the causes for variation, and emphasis must be placed on the identification and implementation of corrective actions within the audited unit.

## References

1. Burgess R. *New principles of best practice in clinical audit*. 2nd ed. London: Radcliffe Publishing; 2011.
2. British Thoracic Society. *Audit & quality improvement*; 2015. Available in <https://www.brit-thoracic.org.uk/audit-and-quality-improvement/> [accessed 10.03.15].
3. Pozo-Rodríguez F, Álvarez CJ, Castro-Acosta A, Melero Moreno C, Capelastegui A, Esteban C, et al. Clinical audit of patients admitted to hospital in Spain due to exacerbation of COPD (AUDIPOC Study): method and organisation. *Arch Bronconeumol*. 2010;46:349–57.
4. Grupo AUDIPOC de Investigación. *AUDIPOC España 2009. Auditoría Clínica sobre las exacerbaciones de la Enfermedad Pulmonar Obstructiva Crónica*. Madrid; 2009. Contiene DVD. Available in <http://www.ciberes.org/audipoc> [accessed March 2015].
5. Pozo-Rodríguez F, López-Campos JL, Álvarez-Martínez CJ, Castro-Acosta A, Agüero R, Hueto J, et al. AUDIPOC Study Group. Clinical audit of COPD patients requiring hospital admissions in Spain: AUDIPOC Study. *PLOS ONE*. 2012;7:e42156.
6. López-Campos JL, Hartl S, Pozo-Rodríguez F, Roberts CM. European COPD Audit: design, organisation of work and methodology. *Eur Respir J*. 2013;41:270–6.
7. An international comparison of COPD care in Europe. Results of the first European COPD Audit. Lausanne: European Respiratory Society; 2012. Contiene DVD. Available in <http://www.ciberes.org/audipoc> [accessed March 2015].
8. López-Campos JL, Hartl S, Pozo-Rodríguez F, Roberts CM. European COPD Audit Team. Variability of hospital resources for acute care of COPD patients: the European COPD Audit. *Eur Respir J*. 2014;43:754–62.
9. Escarrabilla J, Torrenteb E, Esquinase C, Hernández C, Monsó E, Freixash M, et al. en nombre del equipo del Plan Director de las Enfermedades del Aparato Respiratorio (PDMAR) y del grupo colaborador del proyecto MAG-1 Auditoría clínica de los pacientes que ingresan en el hospital por agudización de EPOC. Estudio MAG-1; 2015. Available in <http://dx.doi.org/10.1016/j.arbres.2014.06.023> [accessed March 2015].
10. Pozo-Rodríguez F, Castro-Acosta A, Álvarez CJ, López-Campos JL, Forte A, López Quilez A, et al. The AUDIPOC Study Group. Determinants of between-hospital variations in outcomes for patients admitted with COPD exacerbations: findings from a nationwide clinical audit (AUDIPOC) in Spain. *Int J Clin Pract*. 2015. <http://dx.doi.org/10.1111/ijcp.12601> [Epub ahead of print].