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The educational and practical value of clinical audit in Greece: a pilot study by surgical interns. Is it time to adapt a structured way to improve quality in healthcare?

Thomas Siempis*, Eleni Theodorakou*, Georgios Tsoulfas, Spyros Miliaras, Georgios Marakis

** The first two authors contributed equally to this study.*
1st Departement of Surgery of Aristotle University Thessaloniki, Greece. Papageorgiou Hospital, Ring Road, Nea Eukarpia, Thessaloniki, 56403, Greece

ABSTRACT: Objectives: Clinical audit is a great way of facilitating quality improvement in health services. Our aim is to describe the concept, clinical and educational benefits of clinical audit, as well as present a simple example that can be used as a guide for interns and medical students in Greece. We hope to raise awareness on the subject of quality improvement in our financially challenged healthcare system. **Methods:** The potential educational benefits of the clinical audit were defined and were set as the objectives of this study. It was assigned to a team of surgical interns to select a topic of their choice, conduct a clinical audit, under the necessary supervision, and present their findings. Finally a discussion between the professors and the interns took place in order to assess whether the objectives were actually achieved. **Results:** The interns completed the audit successfully. It was obvious that they managed to improve the initial area of weakness significantly and identify opportunities for further improvement. At the same time this kind of project help them acquire important educational competencies. **Conclusions:** Incorporating clinical audits in medical education proves helpful for interns and for the quality of healthcare offered. This is especially important as it underscores the need and provides the methodology for structural changes that are critical in health care systems facing the global financial crisis.

Keywords: *clinical audit, undergraduate curriculum, pilot study, educational value.*

INTRODUCTION

What is clinical audit?

According to the National Institute for Health and Clinical Excellence (NICE) Clinical audit is a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change. Aspects of the structure, processes, and outcomes of care are selected and systematically evaluated against explicit criteria. Where indicated, changes are implemented at an individual, team, or service level and further monitoring is used to confirm improvement in healthcare delivery[1]. In essence, a clinical audit provides a method for systematically reflecting upon and improving clinical practice. It may answer questions such as the following: What should be happening? What actually happens? What changes are indicated?[2]

The potential benefits of clinical audits

There are many reasons why it is so important to perform clinical audits. In general, it is rather difficult to estimate if your practice needs improvement. It is also very difficult to convince others, whether they are colleagues or employers, that a specific area of practice is not effective and needs changes. A clinical audit can help overcome the above-mentioned difficulties. It is a great way to estimate the quality of services a clinic offers and implement new methods to improve those services[3-5].

Another benefit of clinical audits is that they help to ensure the satisfactory use of a ward's resources and identify ways of improvement. At the same time it is a great opportunity for a ward's staff to improve communication and working relationships. Creating a better working environment is important not only for those who work in a ward, but also for the patients receiving these services.

Last but not least, clinical audits can also be used as a teaching method for medical interns as well as medical students. They can help them achieve important competencies such as the acquisition of interpersonal and communication skills, the effective participation in a health care team, the identification of a problem in the ward's daily operation and many others which are presented in the discussion section of this paper.

Audit topics (see table 1 for common audit topics):

Almost every aspect of the daily clinical practice can be audited. Audits can be undertaken by every person working in a clinical environment such as doctors, nurses, physiotherapists etc. Topics can vary from simple ones such as the incidence of inpatient falls up to more complex one such as the door to needle time for patients eligible for thrombolysis in hyperacute stroke units[6].

Most of the hospitals in the UK conduct national clinical audits for crucial aspects of the clinical practice such as the correct prescription of antibiotics, where the correct indication, duration and conformance to local guidelines is audited[7], as well as audits with respect to people having dementia (for example the use of CT and MRI imaging as part of the assessment and diagnosis and referral to memory clinics)[8].

Corresponding Author: Thomas Siempis, 1st Departement of Surgery of Aristotle University Thessaloniki, Greece., Papageorgiou Hospital, Ring Road, Nea Eukarpia, Thessaloniki, 56403, Greece, Tel: 00306978659716, Fax: 00302310346882 Email: thomassiempis@yahoo.com

Table 1.
Common audit topics

- Are ECGs performed within 20 minutes in ED patients with chest pain?
- Are drugs prescribed in accordance with local guidelines?
- Do all patients have appropriate thromboprophylaxis prescribed?
- Do patients admitted with chest pain have their cholesterol measured?
- How long does it take different doctors to answer their bleep?

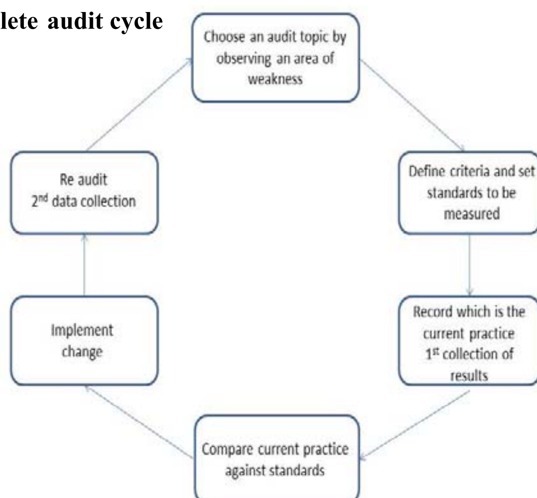
For all the aforementioned reasons, we decided to conduct a clinical audit in an academic Department of Surgery in Greece. Our aim was to give the surgical interns the opportunity to become familiar with the concept of clinical audit, which is relatively unknown in Greece, present a simple example which can be used as a guide and explain its benefits. In addition, this was a great opportunity to use the benefits of clinical audit in order to improve our ward's services. Finally this paper wants to highlight the need to adapt a solid but simple framework to ensure quality in the greek healthcare system which is undergoing a lot of changes and is under financial strain.

METHODS

The following educational goals were set:

1) The understanding of the audit concept and the audit cycle.
2) The improvement of interpersonal and communication skills.
3) The preparation of an oral presentation.
4) The build up of teaching experience by teaching medical students the concept of clinical audit.
5) The acquisition of extra knowledge in a medical topic.

Figure 1. The complete audit cycle



Thereafter it was assigned to a team of surgical interns to find a simple topic of their choice, and conduct a clinical audit by following specific guidelines. Later they would present it to medical students and doctors of the ward since the greek medical community is rather unfamiliar with the concept of clinical audit. Finally, a discussion took place between the interns and the faculty in charge in order to assess whether the objectives determined were actually achieved.
In order to successfully complete the audit project, the interns followed the audit cycle. As the term suggests this involves a cycle of activity, the end-purpose of which is to improve the quality or efficacy of patient care. There are a number of different stages to the audit cycle and all of them must be closely followed to enable a successful audit outcome[1,9]. Failure to do so, invariably leads to an audit project being left incomplete or abandoned altogether.

RESULTS

1st step: Identification of an area of weakness

The responsible surgical interns identified the omission of the recording of the patients' medication on a medical chart placed by the side of the patient's bed as a significant area of weakness in the ward's daily operation. More specifically, they noticed that the medications of the ward's patients were recorded only on the "medication tab", which was kept in the nurses' office, who are responsible for administering the medications. According to them, this undermined the quality of care for the following reasons:

- Doctors had no access to the "medication tab" at any time they wanted, because it was used by the nurses several times during the day. As a result, they couldn't always be informed of the patients' medications in a prompt manner, thus causing delays in the work-flow.
- The doctors wanted to be informed about the patients' medications during ward rounds in order to make necessary adjustments, which meant that the would have to recite them from memory, rather than have them available by the bedside.

For those reasons it was discussed and agreed upon with the head of the department and the consultants, that an audit would be initiated with respect to the recording of each patient's medications on the existing bedside medical chart placed on the side of the bed. This would be updated and assessed daily during the ward rounds. The practice of this audit would improve the level of the medical services of the ward in several ways:

- Each doctor in charge would be fully informed about the patients' medications, thus being able to immediately identify any undesirable effects and make proper adjustments.
- During ward rounds, the doctors would be constantly aware of the patients' medications. As a result, they would be able to evaluate their effectiveness and suggest any necessary changes.
- Students training in the ward could be easily informed about the patients' medications, thus becoming familiar with a variety of drugs, as well as the routes

of their administration and the appropriate dosage for each patient.

2nd step: Defining criteria and setting standards

The following criteria and standards were set:
Criteria: Each patient's medication, the dosage of each drug as well as its route of administration should be registered on their medical chart, placed on the side of his/her bed on a regular basis, right after his/her admission to the clinic.
Due to the lack of relevant references on this subject, a discussion took place between the interns, the doctors in training and the consultants in charge during which the meaning of implementing this proposal was highlighted. Everyone agreed that this project would be beneficial for the ward's staff, as well as educational for the interns. Consequently, the level of the ward's services and the quality of education provided would be enhanced.
Standard: All of the patients who are admitted to the clinic should have their medical chart placed on the side of their bed, on which their medications and route of administration, as well as the dosage of each drug will be written down.

3rd step: Recording of the current practice

Before initiating the clinical audit, a form was created where all the existing patients were recorded and every day new ones were added upon admission. The team of interns was responsible for collecting and evaluating the data. The first data collection lasted a month. The data was collected through daily checks of the patients' existing medical charts. During each check, it was assessed whether the medication was recorded and was properly updated.

4th step: Comparison of current practice against standards

The interns came up with the results presented in Table 2. The results show a deviation of more than 93% from the standard. Thus there was need for drastic measures in order to change the current practice.

Table 2. First data collection

	Total number of patients	Patients having their medication recorded	Standard
1st data collection 20/08/2012 - 03/09/2012	28	2 (7%)	100%

5th step: Implementation of change

The following adjustments were implemented, in order to change the current practice:

- A discussion between the consultants, the doctors in training and the nurses took place, where the importance of this proposal and its mandatory implementation was mentioned.
- The existing medical chart was redesigned and a separate form –"drug chart" for the daily recording of the patients' medications was created.
- The general meaning of clinical audits was presented in a local meeting to the students, where the need to participate actively was highlighted.

Nevertheless, based on the fact that any change usually needs a reasonable amount of time in order to become a habit, all of the staff agreed that one month would be a reasonable adjustment period.

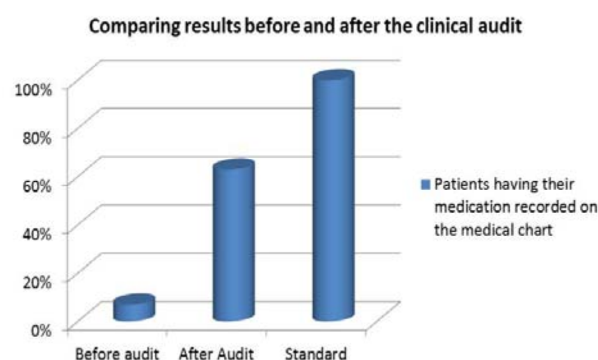
6th step: Re audit

After the first data collection, an adjustment period of one month followed in order for the above changes to be implemented. The second data collection (re-audit) lasted one month. The data was analyzed by the team of interns who oversaw this clinical audit and the results were later handed to the consultant in charge of this project.
After almost two months, the team of interns came up with the following results seen in Table 3 and Figure 2. The period of time between them was an adjustment period during which the above-mentioned changes were practiced.

Table 3. Second data collection

	Total number of patients	Patients having their medication recorded	Standard
1st data collection 20/08/2012-03/09/2012	28	2 (7%)	100%
2nd data collection 04/10/2012-25/10/2012	54	34 (62,96%)	100%

Figure 2. Comparing results before and after the clinical audit



The findings of the first data collection clearly indicate the aforementioned weakness in the ward's daily operation. The findings demonstrate an over 90% deviation from the standard. After the second data collection was completed, it was obvious that the number of patients having a drug chart

increased significantly. However, there is still room for improvement because the gap between the findings and the standard is 38%. The second data collection's deviation from the standard was attributed mainly to the small period of adjustment.

Proposals after the re-audit

The following proposals were made:

- A re-audit should be done in three months' time. This will ensure that the ward's staff continues to conform to the new changes and also evaluate whether the deviation from the standard decreases. At the same time other interns will be given the opportunity to conduct an audit by themselves.
- A questionnaire should be handed out to the interns and doctors in training in order to find out whether the particular change of practice achieved the intended goals.
- Instead of filling out paper forms, a tablet pc could be used during the ward rounds in the future, in order to check electronically all of the patients' medications, laboratory and imaging results.

How were the interns benefited from this project?

As far as the educational objectives are concerned, all of them were achieved. To be specific, the interns understood thoroughly the concept and the benefits of the clinical audit. They became familiar with the patients' daily medication, dosage, route of administration and commercial trademark, thus gaining extra knowledge on an important medical topic. They prepared an oral presentation and presented it to their fellow students. This way they gained some teaching experience. Furthermore they presented their work in a national conference in order to introduce the concept of clinical audit to greek doctors.
During a self-evaluation, when interns were asked if they felt that they participated actively in the ward's daily operation, the answer was unanimously positive. This was attributed to the fact that they were able to see the positive effect that their contributions had to the ward's operation and they were enthusiastic about that. Finally, they agreed that this project was a great chance to develop their interpersonal and communication skills, since they had to coordinate with both with their colleagues and the consultants.

DISCUSSION

Brief History of clinical audits and their place in modern healthcare systems
Florence Nightingale (1800s) and Ernest Codman (early 1900s) were the pioneers of clinical audit. Both Nightingale and Codman monitored morbidity and mortality rates in their respective institutions. Nightingale used an epidemiological method of review, monitoring rates of nosocomial infections in relation to standards of hygiene. Codman introduced the idea of systematic record review as a way of identifying errors[10-12.]
Clinical audits are becoming popular in health services as a first step in quality improvement strategies and as part of the accreditation processes[13]. The principles and philosophy of clinical audits were developed during the process of improving the NHS in Great Britain, where initially the clinical audit was introduced as medical audit. By 1990, participation in medical audit was included in contracts for hospital doctors. In the early 1990s, it became increasingly apparent that it was nonsensical to exclude professions other than medicine from the audit process. As a result, the medical audit evolved into the clinical audit and became a process undertaken by multi-disciplinary teams[3,14,15].
Nowadays it is an essential element of a management model for the health systems better known as clinical governance in the UK[2,4,16]. Clinical governance is a system through which NHS organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in clinical care will flourish.[17.] Clinical audit is one of its five main components (see table 4).

Table 4.

Components of clinical governance	• Risk management (What can and does go wrong during care, putting systems in place to reduce risks etc) • Education, training and continuing professional development (Opportunities for staff to update their skills) • Clinical Audit • Evidence based care and effectiveness (Care for patients should be based on good quality evidence from research) • Patient and carer experience and involvement (Working in partnership with patients and carers.) • Staffing and staff management (Having highly skilled staff)

What is more, clinical audits are part of the "Good Medical Practice" as set out by the General Medical Council in the UK (GMC) which is a guidance for all doctors with respect to their duties and responsibilities in their daily clinical practice (see table 5). Even though clinical audits are not part of the UK doctor's contracts, they are is obligatory for junior doctors in training, with both the GMC and the Postgraduate Medical Education and Training Board emphasizing doctors' responsibilities to engage in this system for quality improvement[5,18]. Foundation doctors should do at least 2 clinical audits, as without this prerequisite, they will not be able to continue into specialty training[3,4]. In order to progress to specialty training, doctors have to prove during their various appraisals or interviews that they actively engage with quality improvement projects, with clinical audits being the best example.
It is obvious then that every member of the healthcare staff in the NHS is responsible for ensuring the best clinical practice possible in his/her ward.
Furthermore, each hospital has an audit committee that helps and guides the healthcare staff into conducting clinical audits and ensures that the audit cycle will be

completed. Finally, regarding the aforementioned national audits that are conducted in most NHS hospitals, their results are being examined by clinical quality care commissions which may impose big fines if the targets are not met. For example, for every C.diff infection that happens inside the hospital above the annual target, a fine of 40,000 pound is imposed [19]

Table 5.

Good medical practice (GMC 2013)[18]
Patients must be able to trust doctors with their lives and health. To justify that trust you must show respect for human life and make sure your practice meets the standards expected of you in four domains:
Domain 1: Knowledge, skills and performance
Domain 2: Safety and quality
Domain 3: Communication, partnership and teamwork
Domain 4: Maintaining trust.

Educational and practical benefits of clinical audits – Our experience

Conducting a clinical audit has multiple educational and clinical advantages. Over the past years, the quality of clinical care has is often criticized by the public and the patients. Clinical audits may help retain and validate this trust and respect by demonstrating that substantial efforts are being made by staff to deliver high-quality professional care to all their patients[20,21]. Taking into consideration that for an clinical audit to succeed, it is necessary to accept its usefulness, enabling and familiarizing interns to undertake audits, certainly leads to this direction.

In our case, the interns completed the audit successfully and their work had a positive impact in the ward's daily operation. At the same time they benefited a lot from undertaking this project as described above. Unfortunately, clinical audit is usually limited to courses in general practice, which are more theoretical than practical. In our opinion, this should change because of the multidimensional value of audits.

More precisely, by undertaking such a project, interns are able to understand the complexities of conducting an effective audit in a professional practice. It is better that clinical audits are assigned either to interns or final year medical students, when both of them are significantly more familiar with the clinical environment and more knowledgeable. As a result, they are more capable of identifying possible weaknesses and solutions and applying them towards their own learning, as well as for the actual benefit of the clinical unit.

Secondly, the active participation in the ward's operation makes them feel as an active and collaborative member of the clinical community. They are able to develop communication skills with other colleagues, as they exchange information in order to identify flaws of the clinical practice. In addition, they are given the chance to understand and respect the roles of other healthcare professionals and the need for collaboration with others in order to promote the patients' care. Finally, they feel that their contribution is valued. This accelerates their personal and professional development as doctors.

As far as the value of clinical audits to the clinical community is concerned, they are beneficial in terms of facilitating quality improvement. This fact is confirmed in our project since all of the participants believed that it has helped to better organize the ward's operation and consequently increase the quality of services offered. After the recording of the medications on the medical chart, it was observed that the ward rounds were simplified, the workload of doctors was reduced and the efficacy of the patients' daily medication was better evaluated.

CONCLUSIONS

During this patient-centered era of medicine, clinical audits should be an indispensable part of everyday clinical practice. Through a self-evaluating process, they provide information about any weaknesses that the infrastructure, processes, and outcomes of care may have and give the opportunity and motivation to implement the necessary changes in order to improve the quality of healthcare services offered.

In general, high quality standards are not only a matter of fiscal affluence. Especially in the middle of this global economic crisis, it is vital to look for cost-effective ways to improve our health systems. As far as our country is concerned, nowadays a lot of vital needs cannot be defrayed, even if they have to do with the people's healthcare needs. This is the reason why we should focus our attention on finding efficient approaches to provide high quality medical services, without consuming any extra funds. Every doctor should accept his/her responsibility for quality in patient's care and strive to find was to improve it. Even though there is no structured way of ensuring the above, trialing clinical audits in teaching hospitals and engaging interns, medical students and doctors in training can be the foundation of bigger changes that may eventually be incorporated in our healthcare system. Clinical audits enable us to achieve this and our students confirmed it by showing how a simple but methodical change of practice can organize a ward's function better.

Hence, it is important to incentivize medical interns and undergraduate medical students to undertake this kind of projects, in order to assure better medical care for the future generations.

Τα εκπαιδευτικά και κλινικά οφέλη του κλινικού ελέγχου ποιότητας στην Ελλάδα. Μια πιλοτική εφαρμογή από τελειόφοιτους φοιτητές Ιατρικής.

Θωμάς Σιέμπης*, Ελένη Θεοδωράκου*, Γεώργιος Τσουλφάς, Σπυρίδων Μηλιαράς και Γεώργιος Ν Μαράκης

Α' Χειρουργική Κλινική Α.Π.Θ. Γενικό Νοσοκομείο Παπαγεωργίου

Οι δυο πρώτοι συγγραφείς συνέβαλλαν εξίσου στην εργασία.

ΠΕΡΙΛΗΨΗ : Εισαγωγή: Ο κλινικός έλεγχος ποιότητας (clinical audit), είναι ένας εξαιρετικός τρόπος βελτίωσης της ποιότητας στα συστήματα υγείας. Σκοπός αυτής της εργασίας είναι να περιγράψει την ιδέα και τα πλεονεκτήματα του κλινικού ελέγχου ποιότητας καθώς και αναλύσει ένα απλό παράδειγμα εφαρμογής του από τελειόφοιτους φοιτητές ιατρικής με απώτερο σκοπό την ευαισθητοποίηση της ιατρικής κοινότητας στο θέμα της βελτίωσης της ποιότητας στο εθνικό σύστημα υγείας. Μέθοδος: Τα εκπαιδευτικά πλεονεκτήματα του κλινικού ελέγχου ποιότητας τέθηκαν ως στόχος αυτής της εργασίας. Εν συνεχεία, ανατέθηκε σε μία ομάδα τελειόφοιτων φοιτητών να διαλέξουν ένα θέμα της επιλογής τους, να ολοκληρώσουν τον κύκλο του κλινικού ελέγχου ποιότητας και να παρουσιάσουν τα αποτελέσματά τους. Τέλος μία συζήτηση έλαβε μέρος μεταξύ των φοιτητών και των καθηγητών ώστε να καθοριστεί αν οι στόχοι αυτής της εργασίας επετεύχθησαν. Αποτελέσματα: Οι φοιτητές ολοκλήρωσαν επιτυχώς την εργασία. Κατάφεραν να βελτιώσουν σημαντικά το πρόβλημα που εντόπισαν στην καθημερινή κλινική πράξη και να προτείνουν ιδέες για βελτίωση. Παράλληλα, η συγκεκριμένη εργασία τους βοήθησε να αποκομίσουν σημαντικά εκπαιδευτικά οφέλη. Συμπεράσματα: Η ενσωμάτωση του κλινικού ελέγχου ποιότητας στο πρόγραμμα των φοιτητών, ωφελεί τόσο τους φοιτητές όσο και την ποιότητα στο σύστημα υγείας. Αυτό είναι εξαιρετικά σημαντικό καθώς μπορεί να αποτελέσει ένα εργαλείο για διαρθρωτικές αλλαγές που είναι αναγκαίες σε συστήματα υγείας που αντιμετωπίζουν την παγκόσμια οικονομική κρίση

Λέξεις κλειδιά: Κλινικός έλεγχος ποιότητας, πιλοτική εφαρμογή

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