Implementation of criteria-based audit to reduce patient’s burdens and improve efficiency in hospital management

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Abstract
This article aimed at exploring the implementation of criteria-based audit (CBA) to reduce patient’s burdens and increase efficiency in hospital management. The social background and CBA definition were evaluated by screening using the new 3A grade hospital evaluation criteria. The confirmation of the hospital-department two-level CBA management performance appraisal was based on six core indicators (2A4P). The feasibility of CBA was evaluated by comparing the changes of 2A4P before the implementation of CBA management performance appraisal and 1 year after the implementation of CBA. The 2A4P data in 2017, 1 year after the implementation of CBA performance appraisal, showed a significant improvement (P < 0.05 or P < 0.001) than before the CBA implementation in 2016. CBA supports the management to meet the objectives in the basic system, standardization, and service, which significantly optimizes the 2A4P data, therefore helping achieve the goal of reducing burdens and increasing efficiency. CBA is an effective management performance appraisal model to evaluate the basic system and the professional standard of modern hospitals under the current social background.

Keywords
criteria-based audit, feasibility evaluation, hospital management, performance appraisal, the new medical reform

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Introduction
The current condition of medical service which is a concern for the society today is the understanding that “medical treatment is difficult and expensive.” Alleviating this perception is a key point and the ultimate goal of the new national medical reform.1 Reformation in the intercorrelation of “medical care, medicine, and medical insurance (3M)” is an important measure of the new medical reform. The main goal of RBIE (Reduce Burdens and Increase Efficiency) is to steadily control increase of medical expense within a reasonable range, reduce patient’s medical expenditure burden, and improve the efficiency of hospital management.2

RBIE highlights not only the philosophy of “Everything is centered on the health of the people,” but also the main strength of People’s Republic of China hospital reform.3 The 19th session of the Communist Party of China National Congress reconfirmed the current principal social contradictions and thus further clarifies China’s healthcare strategy and postulates the construction of a modern hospital management system. All of the above highlights the importance of hospital management of RBIE.4

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This article summarizes management performance appraisal with criteria-based audit (CBA), which was launched in 2017, in the Affiliated Hospital of Hebei University of Engineering. The result of our experience may provide a reference in healthcare strategy practices in China, promoting a new era of hospital reform guided by the government, that emphasize the prevention and control of chronic diseases as the core, by implementing intercorrelation of the “3M,” which manifest in the embodiment of the new era of hospital management reform to achieve the RBIE goals.

**Background and methodology**

**Background**

The People’s Republic of China new medical reform, since its implementation in 2009, always focused on reducing the patient’s medical expense burden to meet the demand for basic medical services and on providing relief from the perception of “difficult and expensive medical services.” The state has comprehensively improved the level of medical insurance coverage for employees or residents; nevertheless, the coverage of patient’s overall medical expenses, especially the self-paying ratio, has not decreased and the feeling of seeking medical treatment has not improved. In response to the situation, in early 2016, “3M” cooperation reform was activated.

The national “3M” cooperation consists of the components referred to as 2A4P, that is, average expenses of outpatient (AEO); average expenses of discharged patient (AED); drug expenditure proportion of discharged patients (proportion of drug (PD)); proportion of consumables of the discharged patient, of which ¥100 of medical expenses is considered as the variable (proportion of consumables (PC)); self-funded proportion in medicine, equipment and consumption of patient with health insurance (proportion of self-funding (PSF)); and proportion of critical patients among the discharged patients (proportion of critical patients (PCP)). The integration of 2A4P into the hospital performance appraisal index becomes an important part of the direct reporting network and the dynamic management efficiency evaluation.2–4

The Affiliated Hospital of Hebei University of Engineering is a newly developed 3A grade hospital in Handan City, Hebei Province, China. The hospital’s benefit index showed a significant decrease, after 10 years in a row of development, since the implementation of “3M” linkage wherein the 2A4P evaluation of the hospital resulted in a low ranking. In the self-assessment by reexamination and large-scale inspection, it was exposed that the hospital presented numerous significant quality shortcomings. In review of the shortcomings, the hospital’s Quality Management Committee (QMC) and Academic Ethics Committee (AEC), referred to as the Two Committees of Hospital (2CH), felt the necessity to rectify the institution, specifically regarding hospital management as well as in clinical diagnosis and treatment capability, in order to meet the new medical reform goal. The 2CH considered that the institution needed to adapt with the “3M” linkage. The institution must also implement the strategy of Healthy China, which emphasized transformation of the work setting in the hospital from focusing on “diagnosis and treatment” into “prevention and control” of slow diseases. Furthermore, it was emphasized that RBIE must be implemented along with employee welfare.

**CBA and related concepts**

CBA, which is based on the theory of financial accounting audit quality standard, centered on the patient’s healthy feeling, with its core focus on hospital management and service specification. Along with performance dynamic or node quality audits to evaluate clinical benefit results, CBA aims at constantly improving the quality control and management level of the hospital and maintaining the health of the residents in the region or even the whole country. The early application of CBA started in the quality management and evaluation of the maternity department in the Third World countries, and it has been popularized by the World Health Organization (WHO) in this century.5,6 CBA became an additional hospital quality and safety management tool, supplementing the Plan-Do-Check-Action (PDCA). While PDCA focuses on continuous improvement of quality control management tools, CBA, on the other hand, focuses on standard evaluation and assessment of basic management parameters and medical quality to improve the level of basic medical service and to meet the basic health needs of the people.7

The 2A4P is a direct quantifier of the quality of medical services offered to a patient by the hospital and is also an important reason for the tension
between doctors and patients. There are still some problems in the process of medical reform. For example, the labor costs and technical fees of medical staff are increasing slowly, but the application of new drugs and high-tech is relatively fast, resulting in a significant increase in the cost of medicines and consumables. This result will not only make the patient’s service to the hospital dissatisfied but also make the medical staff feel the management essentials of CBA.

After organizing a discussion with the entire hospital staff, 2CH explicitly initiated the hospital department two-level performance appraisal with CBA from December 2016 and revised a complete set of hospital management rules and regulations aimed at reexamining the new 3A grade hospital and strengthening the standardized quality management protocol for clinical pathway and the disease diagnosis–related group (DRG) and evaluation criteria for effectiveness of patient-centered health management services. The following section details the CBA measures that have been implemented in a focused manner.

**To develop a CBA scheme based on 2A4P and strengthen the management of the basic behavior of the whole staff.** The “3M” linkage measures of the new medical reform fell to the ground, significantly restricting the implementation of traditional management performance appraisal based on medical benefits. The 2CH, as mentioned earlier, clearly defined “2A4P” as the core index of the hospital department two-level performance appraisal and the monthly examination and quarterly evaluation have been implemented. The first was awarded and the last was punished. Through discussions with the staff and training regarding the basic idea, institution, standard, and service standard, the importance of the basic professional behavior was defined and the necessity for continuous CBA examination management was emphasized.

**To formulate management standards, strengthen the standard management of functional departments, and expand their responsibilities.** “2A4P” is the basis of clinical professional department management behavior, and its essence involves all levels of the overall management of the hospital. First, to achieve high-quality CBA implementation, 2CH begins with the optimization of the system and measures the following: standardized management of daytime operation, efficiency improvement of medical cooperation, construction of rural doctor training base and “health huts,” and contract with family doctor and other “3M” linkage policies to optimize the “2A4P” standard environment; second, the hospital functional departments are required to sort out all the relevant system and link quality management elements of “2A4P,” to learn in depth about the new legal system, update relevant systems, standards, and norms in due course; third, a system of professional department commissioners for functional departments are established to collect feedback on CBA review on time, for timely updates, and for perfecting the strategy after discussions and reviews with the 2CH.

**To formulate standards for professional skills and strengthen the management of the “three bases” to meet the standards.** 2CH helped strengthen the centers for chest pain, stroke, trauma, tumor, first aid, and so on, by expanding the connotation of professional diagnosis and treatment quality, raising the visibility of regional society, and combining the increasing the number of disease sources in departments while optimizing the level of CBA management with “2A4P” in the departments. On the basis of RBIE management, the 2CH advocates that the department of clinical medicine and technology should cultivate the following “three bases and three strict” goals, namely, “basic theory, basic skill and basic ability.” At the same time, the functional departments are required to organize the clinical path and DRG training in time and work towards the following goals: to make a clear distinction between common disease and difficult disease, standard path and innovation technology, skill training and scientific research innovation; to optimize the quality structure of medical and nursing professionals and to strengthen the training and learning of the latest norms, consensus and indicators; to renew and optimize the clinical pathway and the quality and intention of DRG continuously; and to promote the improvement of the three basic qualities of disease prevention and control.

**To formulate the quality standard of health service and expand the vision of medical humanistic service.** Based on the research results of “Research and Practice of Health Management Service in 3A Grade Hospitals,” published by the provincial social science subject of our hospital and from the perspective of practicing
the healthy China strategy, 2CH will vigorously promote the following: the building of the health service capacity of the hospital staff with the guidance of the health skills of the medical personnel in the specialized clinical departments as the core; establishing CBA assessment standards for health service quality; integrating the health skill guidance of the patients, especially the inpatients and their relatives (Patient Side, PS) into the quality assessment of disease diagnosis and treatment to improve the disease health awareness of PS and the “patient participation safety” management; strengthening the level of participation in the diagnosis and treatment of patients in hospitals, such as pain, nutrition, rehabilitation, psychology, and traditional Chinese medicine; steady improvisation of the quality of diagnosis and treatment of non-pharmaceutical equipment diseases; and steady improvisation in the patient’s awareness of community and family rehabilitation, practically improving the connotation and referral ratio of “two-way referral, grading diagnosis and treatment.”

To establish the CBA quality control standard and tamp the foundation of the hospital-department two-level quality control. From the angle of CBA connotation and quality, 2CH clearly requires that quality control, information, finance, and audit cooperate with medical, nursing, pharmacy, equipment, and outpatient department to establish a relevant system of “2A4P” and the audit standard that the standards and norms are detailed and up to standard with the following goals: to refine, optimize, and quantify all the influencing factors of “2A4P,” to revise the clinical pathway and DRG standard regularly, and to measure and evaluate the CBA standard; to strengthen the PS health guidance, health cognition, safety management and healthcare ability, and the other basic ability CBA standard formulations; and using the PDCA tools to update, optimize, and refine the index of CBA, steadily achieve the hospital RBIE goal.

Results

PD and PC

The median of PD and PC trends and comparisons between the hospital and the provincial hospitals in 2016 and 2017 are shown in Figure 1. The results showed that, for PD, both groups showed a gradual downward trend in 2016; furthermore, no significant difference was observed between both the groups (P > 0.05). The PD of the hospital decreased significantly in 2017, and there was a significant difference between the two groups (average P < 0.01). For PC, both indicators declined in 2016; however, the hospital’s data were always higher than the provincial hospital median (average P < 0.01); after the implementation of CBA management in 2017, the indicators of the hospital decreased rapidly. It was significantly lower than the median of the provincial hospital (average P < 0.001).

AEO and AED

There was no significant difference in AEO between the two groups in 2016 (P > 0.05); AEO of the hospital decreased significantly in 2017 (average P < 0.01). AED also showed a significant difference since December 2016 (average P < 0.01). The difference in 2017 was more significant (average P < 0.001; Figures 2 and 3).

PSF and PCP

For PSF, the hospital indicates an advantageous median (P < 0.05 or average P < 0.001) compared to the provincial hospital. For PCP, the gap of the median between the hospital and the provincial hospital was narrowing in 2016, with a significant difference (average P < 0.001); the difference value of
the hospital decreased gradually in 2017 and slightly exceeded the provincial hospital’s median value in December 2017 ($P < 0.05$; Figure 4).

**Conclusion**

The CBA performance appraisal with “2A4P” as the core index in the Affiliated Hospital of Hebei University of Engineering showed a remarkable effect at 3 months after implementation, and the hospital was able to achieve the targeted standard in 6 months. It demonstrates the importance of implementing professionalism as the standard for the hospital’s management and staff in order to reach the goal set by the government, which is the “3M” cooperation, and provide service to the community. A carefully designed criterion-based audit may provide one of the most efficient methods of audit.
Discussion
At 1 year after the implementation of CBA, based on the refinement, quantification, and optimization of the system, the management of CBA evaluation and assessment were observed to be the main factors. CBA effectively improves the quality of the three basic codes of conduct and promotes the RBIE standards. It has been advocated that the hospital management is not to innovate the management mode or copy the “advanced experience,” and should compare their results with the national standards and the inspection and acceptance guidelines through a practical and effective basic system. The CBA management of the basic standard and basic data forms the foundation, and a highly efficient system reaches a high standard.

To institutionalize, digitize, and standardize the contents of PS health services, such as health
cognition, skill learning, disease prevention and control, and healthcare ability, it is imperative to fully mobilize the patients by promoting “patient participation in patient safety” using substantive and scientific management practices. In order to improve the patient’s correct understanding of “2A4P” and to improve participation in day-to-day operations, two-way referrals, skill guidance, and chronic disease prevention and control, the importance of health management service ability and standard assessment of healthcare staff has been highlighted as an important need.

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