Current Situation, Challenges, and Improvement Strategies of Hospital Medical Record Management

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Abstract: With the rapid development of medical technology and information, hospital medical record management has become an indispensable part of medical institutions. However, as the medical environment and technology undergo transformations, medical record management faces new challenges. This article aims to explore the current status of hospital medical record management, analyze the challenges it faces, and propose corresponding improvement strategies to further advance and optimize medical information. Through the implementation of these strategies, we hope to propel hospital medical record management towards a more efficient, accurate, and secure direction, thereby better serving both medical institutions and patients.

1. Introduction

As the core component of the social medical system, hospital undertakes the important task of diagnosing, treating and nursing patients. In this process, medical record management, as an important part of medical information, aims at recording, statistics and analysis of patients' diagnosis and treatment information, providing strong support for medical quality improvement, scientific research and hospital management. Therefore, it is very important to optimize the medical record management system and improve the quality of medical service.

2. The necessity of hospital medical record management

2.1 Basis and support of medical decision making

Medical record management plays a key role in medical decision making. Doctors and medical teams rely on medical records for information about a patient's history, diagnosis and treatment. This information is essential for personalizing treatment plans, adjusting medication dosages, and deciding whether to have surgery, among other things.

First of all, detailed history records in medical records can help doctors gain a deeper understanding of the patient's disease course. [1]By knowing a patient's past illness, treatment

experience and drug response, doctors can more accurately assess the current health status and avoid unnecessary repeated tests and treatments, thus improving medical efficiency. Secondly, the diagnostic information in the medical record is one of the key factors in making a treatment plan. The doctor can establish an accurate diagnosis by analyzing laboratory results, imaging data, and clinical observations in the medical record. This helps to avoid misdiagnosis and missed diagnosis, and ensures that patients receive timely and appropriate treatment. In addition, the treatment records and medication information in the medical record are crucial for adjusting the treatment plan. The doctor can adjust the dosage and type of medication according to the patient's response to different medications to achieve the best treatment results. This personalized treatment strategy can improve efficacy while reducing the risk of adverse drug reactions. Finally, the decision about whether to have surgery is also based on data from the medical record. Surgical risk assessment, preoperative preparation, and postoperative monitoring all rely on the patient's medical record information. Doctors can weigh the advantages and disadvantages of surgery according to the patient's overall health, surgical history and relevant examination results, and provide patients with more personalized and precise treatment plans. Therefore, the data in the medical record can help doctors understand the patient's condition more accurately, so as to make more grounded medical decisions and improve the treatment effect and patient satisfaction.

2.2 Guarantee of medical quality and safety

Medical record management is an important guarantee mechanism for medical quality and safety. It is not only a means to record patients' medical information, but also a core mechanism to ensure medical quality and patient safety. By recording a patient's entire medical journey from admission to discharge in detail and accurately, including diagnosis, treatment plan, drug use, surgical records and their follow-up results, medical institutions are able to conduct comprehensive monitoring and evaluation of medical services. [2] Proper medical record management provides critical decision support information for doctors, nurses and other healthcare personnel. Through regular analysis and review, medical teams can detect potential medical errors, inappropriate treatment methods or adverse reactions of patients in time, so that treatment plans can be adjusted in time or prevention strategies can be formulated to ensure the continuous improvement of medical quality. Sound medical record management can also enhance communication and collaboration among healthcare teams. When each staff member has a clear and complete picture of a patient's medical journey and status, they are better able to work together to ensure that patients receive the best possible care.

2.3 Fundamentals of medical research and data analysis

The value of medical record data in the medical field is not limited to providing clinical information, its depth and breadth provide rich resources for medical research and education. Each medical record is a unique medical story of the patient, containing detailed data on the onset, development, treatment and outcome of the disease. When aggregated on a large scale, these data can shed light on the prevalence of the disease, who is at high risk, and how it relates to other factors, providing key clues for prevention and treatment. [3]

From the perspective of medical research, medical record data provide researchers with real and objective clinical information. Based on this data, they can conduct a variety of statistical analyses to evaluate the effectiveness of treatments, the safety of drugs, or the indication of new technologies. In addition, with the development of big data and artificial intelligence technologies, medical record data can also be used for deep learning and model training to predict the development trend of a disease or a patient's treatment response. For medical education, medical record data is valuable teaching material. By studying real cases, medical students and medical staff can gain a deeper

understanding of the clinical manifestations of diseases, the basis for diagnosis and treatment strategies. This learning style based on real cases can not only cultivate their clinical thinking, but also enhance their decision-making ability and operational skills when facing complex cases.

3. Current situation and challenge of hospital medical record management

3.1 Electronic development process

In recent years, with the rapid development of information technology, the medical industry is also undergoing a revolutionary change. In particular, most hospitals have shifted from relying on heavy, hard to manage and retrieve paper medical records to more advanced, flexible and intelligent electronic medical record management systems (EHRs).[4] For doctors, nurses and other healthcare workers, EHRS offer a range of indispensable benefits. First, the system can update and access patient information in real time, which greatly improves work efficiency and response speed. There is no need to rush between various departments of the hospital looking for paper files, and all the data can be easily accessed in a few clicks, which not only saves time, but also reduces the possibility of errors. The electronic medical record system is also highly searchable. Doctors can quickly find relevant medical data through multiple search criteria, such as patient name, symptoms, and historical diseases. This changeability greatly facilitates the diagnosis and treatment of complex cases, as well as the conduct of large-scale clinical studies.[5]

In addition to basic data storage and retrieval functions, modern electronic medical record systems often include advanced data analysis tools. These tools can help doctors more accurately analyze a patient's condition, personalize treatment plans, and track and evaluate outcomes. [6] For example, by analyzing treatment response data from large numbers of patients, doctors can more easily identify which treatments are more effective in a given situation. In addition, an electronic medical record system can also help optimize the allocation of medical resources. Through data analysis, hospital management can more easily identify which equipment, personnel or drugs are bottleneck resources, so as to make more scientific and rational decisions. The electronic medical record management system can also be seamlessly integrated with other medical information systems such as Hospital management System (HIS), laboratory information management system (LIS), etc., to build a comprehensive and efficient medical information management network.

3.2 Standardization and data consistency issues

Although electronic medical record systems offer many advantages in the modern medical field, in practice, they also face some challenges due to inconsistencies in standards between different hospitals and medical systems, resulting in incomparable data. [7]

First, different standards and terminology are used between different hospitals and medical systems to record diagnoses, treatments and procedures. Instead of following national or international standards, some hospitals may have adopted custom diagnostic codes or treatment procedures for specific clinical practice needs. This makes it impossible for data to be seamlessly matched across different systems, creating difficulties in data integration across systems. For example, one hospital may label the diagnosis of A particular disease as "Type A", while another may use a completely different label, which adds complexity to data comparison and analysis. Second, even if some industry standard exists, there may still be differences in understanding and application in practice by different hospitals. [8] This may be due to differences in clinical practice culture and professional habits within hospitals as well as regional differences. These differences can lead to differences in the entry and interpretation of specific data, even if the same criteria are used, thus reducing the consistency and comparability of data.

3.3 Underutilized of information

Although hospital medical records have accumulated a wealth of medical data, there are still deficiencies in the effective use of information. [9] These data contain valuable medical resources, which can be used in clinical decision-making, disease research and other fields. However, due to the fragmentation of data and the lack of standards, many times these data cannot be fully mined and applied, resulting in the waste of medical resources.

3.4 Data protection and privacy issues

With the acceleration of digitization in the medical field, a large amount of sensitive data such as patient health information, examination reports and treatment plans are stored in electronic systems. While this shift has brought many conveniences, it has also put data security and patient privacy at the forefront. [10] In recent years, many medical institutions have suffered from data leakage, malicious hacker attacks and illegal data trading, which not only seriously infringed on patients' privacy rights, but also brought physical and mental harm to patients. [11]For medical institutions, such data leakage may lead to damage to their reputation, and even face huge compensation and legal liabilities.

3.5 Training and skills upgrading needs

In today's digital age, the medical field is also increasingly relying on electronic management systems to improve work efficiency and patient care. But this shift means that medical staff need to have certain IT skills in order to utilize these systems effectively. However, for many medical staff who have long been accustomed to the traditional way of working, they may never have received formal IT-related training, which makes them feel lost and confused when they first contact and use the electronic medical record system. Compared with paper systems, the operation process of electronic medical records systems may be more complex, involving a variety of data entry, query and storage techniques.[12] For medical staff who have not experienced electronic training, they may think that the operation of electronic systems is not as intuitive and simple as that of paper systems, and they may even worry about making mistakes due to their unfamiliarity with the technology. [13]This has led to many medical institutions facing huge training challenges in the electronic process.

3.6 Insufficient legal knowledge

The medical field involves the regulation of numerous laws and regulations, some of which play a critical role in protecting patient privacy, ensuring information security, and maintaining the integrity of medical records. The range of these laws and regulations is broad and constantly changing, covering everything from personal privacy to data processing processes. In addition, regulations on the confidentiality of medical records require medical institutions and related personnel to adhere to strict confidentiality standards when handling medical record information to prevent unauthorized data disclosure. However, the complexity and diversity of these regulations may lead to difficulties for hospital medical record managers in practice. Legal documents often use technical terms and legalese, which can make it difficult for case managers to understand the actual meaning and requirements of regulations. In addition, as regulations continue to evolve and be updated, it can be challenging to remain sensitive to these changes, as this requires ongoing legal education and training. This lack of legal knowledge can give rise to issues in the information processing, such as erroneous information sharing, privacy breaches, and possibly even violations

involved, which can negatively impact a hospital's reputation and compliance.

4. Improvement measures for hospital medical record management

4.1 Develop and promote unified standards

To overcome barriers to the use of healthcare data, healthcare authorities, relevant associations and institutions can collaborate to develop and widely promote standardization of healthcare data. By establishing common data formats, standards and content requirements, medical record data in hospitals across the country can be ensured to remain consistent in the overall structure, which will help facilitate the interoperability and integration of data. [14]Such standardized measures will facilitate the flow of medical information and reduce the problem of data fragmentation.

At the same time, the use of advanced means of information technology, such as machine learning and data cleansing techniques, can help deal with inconsistencies and errors in data. Machine learning can automatically identify abnormal data and patterns, help spot potential problems with the data, and provide suggestions for correction. Data cleaning technology can detect and fix omissions, errors and duplicates in data, improving its quality and accuracy. In order to ensure long-term data quality, it is essential to establish a data quality inspection mechanism on a fixed period. The hospital medical record data is reviewed regularly to find possible problems and to identify and correct data quality challenges in a timely manner. This mechanism not only helps maintain the high quality of data, but also improves the transparency and credibility of data management, providing reliable data support for medical decision-making and research.

4.2 Medical data application and optimization strategy

Building a special data analysis platform can process and analyze the huge medical data more efficiently. Such a platform not only needs to have strong data processing capabilities, but also intelligent data mining and analysis functions, enabling doctors and managers to quickly identify key information and trends from the vast amount of medical record data. [15] In addition, the promotion of clinical decision support systems is a key step in medical innovation. Such systems combine medical record data with advanced algorithms and medical knowledge bases to provide powerful auxiliary suggestions for doctors when facing complex diseases. This will not only improve the accuracy of diagnosis, but also provide patients with more personalized and targeted treatment plans, thus improving treatment results.

In order to enable medical institutions and government departments to deeply understand and evaluate the quality of medical services, regular statistics and analysis reports of medical records are indispensable. [16]These reports should contain detailed data indicators, trend analysis and assessment of current medical conditions, so as to provide decision-makers with scientific and objective decision-making basis. Such reports can also enhance the public's trust in medical services and encourage medical institutions to continuously improve their services.

4.3 Improve medical data privacy protection

Use advanced data encryption technology to ensure the security of stored and transmitted medical record data. In addition, establishing strict data access control is key to ensuring that medical record data is not misused, and only medical personnel with specific authorization have the right to view or modify this sensitive information. To further strengthen the security of the data, we can also consider using multi-factor authentication to ensure that only truly authorized users are able to log on to the system and access the data. The use of modern network security technologies,

such as firewalls, intrusion detection systems, etc., can effectively defend against external threats and network attacks. More importantly, even if the technology is perfect, the security of data may still be threatened if the awareness of data privacy protection is not enough among medical staff. Therefore, regular data privacy training for healthcare staff is essential.

4.4 Improve staff's medical record management capacity

Medical record management is a key link in the medical field, which is related to the quality of medical services and the protection of patients' privacy. In order to ensure the high efficiency and standard of medical record management, it is very important to organize regular training of medical record management skills. Training can help medical staff to understand and master the latest standards, technologies and processes of the industry in time, so as to ensure the accuracy and efficiency of medical record management. At the same time, professional certification that encourages medical staff to participate in medical record management is an effective means to motivate them to continuously improve themselves. Professional certification can not only prove the professional ability of medical staff, but also contribute to their career development. Through certification, they can be widely recognized in the industry and lay a solid foundation for their future career.

In addition to internal training and certification, bringing in external experts in the field of case management is also an effective strategy. These experts often have a wealth of practical experience and unique insights, and they can bring the latest management ideas and techniques to the hospital. By inviting these experts to the hospital for lectures, seminars or workshops, medical staff can get cutting-edge knowledge input, but also bring new ways of thinking and management for medical institutions, and promote the continuous innovation and improvement of medical services.

4.5 Strengthen the legal knowledge of medical record management staff

In response to the lack of legal knowledge of case managers, hospitals should establish regular legal training programs to ensure that they are familiar with and adapt to changes in regulations. The training content can cover medical privacy, patient rights, data protection regulations, etc., while closely combining theory with practice, so that case managers can better understand and apply legal knowledge. In addition, it is recommended that hospitals cooperate with legal experts to provide regularly updated training, as well as answer legal questions that medical record managers encounter in their practical work. Hospitals can organize case analysis sessions for case managers to share and discuss legal challenges and solutions encountered in their actual work. Such exchanges facilitate collective learning and experience sharing, and improve case managers' resilience when dealing with legal issues. In addition, cross-departmental cooperation with legal departments is encouraged to ensure that case managers have access to professional legal guidance and support when needed, so that they can deal with complex legal situations with more confidence. Through the above strategies, hospitals can effectively solve the problem of insufficient legal knowledge of medical record managers, improve their legal literacy and compliance awareness, ensure that patients' privacy is fully protected, and improve the quality and credibility of hospital medical record management.

5. Conclusion

In the modern medical system, medical record management plays a crucial role, which is not only related to the operation efficiency of medical institutions, but also affects the patient's diagnosis and treatment experience and medical quality. Through the in-depth discussion of the

status quo, challenges and improvement strategies of hospital medical record management, we have a clearer understanding of its value and criticality in medical service. Although the medical record management has been greatly improved in many hospitals, it still faces many challenges. However, these challenges also provide us with opportunities for improvement. In the future, we can use artificial intelligence, big data analysis and other technical means to realize the automatic sorting and analysis of medical record data, so as to improve management efficiency and decision-making quality. At the same time, hospitals should also strengthen internal training, improve the medical staff's understanding of and attention to medical record management, and ensure the accuracy and integrity of data from the source.

To sum up, hospital medical record management plays an important role in the medical system. Although facing many challenges, we can gradually realize the modernization and efficiency of medical record management through continuous efforts and innovation, which can ensure that hospital medical record management can better serve patients and contribute to the improvement of medical quality

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