Nursing Informatics 2018
A.K. Rotegård et al. (Eds.)

doi:10.3233/978-1-61499-872-3-238

Design and Application of Nursing CDSS Based on Structured EMR

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Abstract

To improve the safety, quality and efficiency of clinical nursing work by establishing intelligent nursing CDSS. Establishing nursing CDSS through the knowledge database of nursing plan and nursing routine. After use, the system nursing documents writing time was reduced, accuracy of nursing diagnosis was improved, and nursing risk events were decreased. Establish nursing CDSS is the trend of information development in hospitals, so it is worthy of clinical application.

Keywords:

Structured Electronic Medical Records; Information Systems; Nursing Clinical Decision Support System

Introduction

Our hospital passed the HIMSS EMRAM Stage7 (hospitalization) assessment on August 28, 2017. We have made a lot of improvements around the construction of electronic medical records (EMR). Nursing structural EMR is reformed to realize the extraction and utilization of useful information [1]. There are requirements of HIMSS Analytics for Clinical Decision Support System, (CDSS) [2]. The birth of CDSS promoted the development of electronic medical records in the direction of intellectualization and knowledge [3].

Method

1. To establish knowledge base based on international common criteria and clinical specialist nursing guidelines.

Hospital is a knowledge-intensive organization [4]. We maintaining the rules for judging illness changes into the system, after the patient's vital signs were instable, the system would immediately through Clinical Data Center (CDR) to calculated, reach early warning, then active remind medical staff should make the corresponding rescue preparations to ensure the safety of patients.

2. Risk Factor Assessment

We use internationally recognized scale, such as Barden pressure ulcer assessment scale, and so on. The system can automatically statistic the total score after input the result. When the score result is abnormal (pain > 4, and so on), show that patients in abnormal, according to the set rate of assessment, the system will inform and remind the nurse timely reassessment. We developed intelligent nursing planning decision-making system. According to different levels of risk, intelligence to give different nursing diagnosis and nursing measures. The knowledge base on nursing plan was established on the basis of the International 216 Nursing Diagnostic Classification system (NANDA) [5].

3. Smart Reminder of Special Operation

Such as skin test, we embed different medicine skin test observing time in the system. When nurse give patient penicillin's skin test, system automatic timing ,15 min later, PDA will make a sound and appear "Now should check xxx medicine skin test, time is over" to remind nurse checking the skin test results, which make our operation more correctly and timely.

Result

1. Improving the Accuracy of Nursing Diagnoses

We referred to medical records, shows that the accuracy of nursing diagnoses was significantly improved (Table 1).

Table 1. The accuracy of nursing diagnoses before and after the using the system [n (%)]

Items	Number	Accuracy of nursing diagnoses (%)	c2	p
Before	300	68.33	45.907	0.000
After	300	90.67		

2. Reducing the Incidence of Nursing Risk Incidents

We contrasted nursing quality, shows that the incidence of nursing risk events were decreased (Table 2).

Table 2. The incidence of nursing risk events before and after the using of the system [n (‰)]

Items	beds	2016	2017	c2	*p*
Incidence of falls(‰)	631702	80 (0.127)	45 (0.071)	13.004	0.000
Incidence of pressure ulcers(‰)	638715	41 (0.064)	18 (0.028)	15.071	0.000

Conclusions

Intellectualized nursing EMR system based on the large-scale integrated hospital information system, make the EMR is not only a record of the nursing process, but also the strong clinical support system, truly taking patients as the center, meet the demand of care [6]. We will continue to refine follow-up care plan decision knowledge base, in order to achieve more convenient and the wisdom of the meticulous care.

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