Apply creative thinking of decision support in electronic nursing record

Angelica Te-Hui HAO, Chien-Yeh Hsu, Huang Li-Fang, Wen-Shan Jian, Li-Bin Wu, Ching-Chiu Kao, Mei-Show Lu, Her-Kun Chang

Abstract. The nursing process consists of five interrelated steps: assessment, diagnosis, planning, intervention, and evaluation. In the nursing process, the nurse collects a great deal of data and information. The amount of data and information may exceed the amount the nurse can process efficiently and correctly. Thus, the nurse needs assistance to become proficient in the planning of nursing care, due to the difficulty of simultaneously processing a large set of information. Computer systems are viewed as tools to expand the capabilities of the nurse’s mind. Using computer technology to support clinicians’ decision making may provide high-quality, patient-centered, and efficient healthcare. Although some existing nursing information systems aid in the nursing process, they only provide the most fundamental decision support – i.e., standard care plans associated with common nursing diagnoses. Such a computerized decision support system helps the nurse develop a care plan step-by-step. But it does not assist the nurse in the decision-making process. The decision process about how to generate nursing diagnoses from data and how to individualize the care plans still reminds of the nurse. The purpose of this study is to develop a pilot structure in electronic nursing record system integrated with international nursing standard for improving the proficiency and accuracy of plan of care in clinical pathway process. The proposed pilot systems not only assist both student nurses and nurses who are novice in nursing practice, but also experts who need to work in a practice area which they are not familiar with.

Keywords: Nursing Clinical Pathway, Electronic Nursing Record, Decision support

1. Introduction

The health insurance claim rule continuing changes in recently. The Diagnosis Relationship Group (DRG) and global budget has been change nursing care style in Taiwan. Also the Clinical pathway becomes a major index for nursing care. [1,2].

There are many same record with nursing record and clinical pathway record and nurses always double working for these records. Although computerize nursing record is develop for many hospitals, But defect the same style and
couldn’t to exchange for share patient’s data and knowledge management. Therefore, that is importance for development electronic nursing record integrated with clinical pathway.

2. Literature Review

Clinical pathway is a standard style for specify disorder that examination, treatment, nursing care, and health education since patient admission through discharge. The urology has a lot of clinical pathway in the medical center that we studied. In this kind of ward, the top three clinical pathways are Benign Prostate Hypertrophy (BPH), inguinal hernia, and Urinary tract stone. The cost analysis for these three clinical pathways in Table 1:

<table>
<thead>
<tr>
<th>Item</th>
<th>Patient number</th>
<th>Insurance cost (NT$/p’t)</th>
<th>Nursing cost (NT$/p’t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPH</td>
<td>220</td>
<td>49,000</td>
<td>2,500</td>
</tr>
<tr>
<td>Inguinal hernia</td>
<td>100</td>
<td>24,000</td>
<td>800</td>
</tr>
<tr>
<td>Urinary tract stone</td>
<td>500</td>
<td>40,000</td>
<td>800</td>
</tr>
</tbody>
</table>

The International nursing standard has many kinds such as North American Nursing Diagnosis Association (NANDA) [3], International Classification for Nursing Practice (ICNP) [4], and Nursing Intervention Classification (NIC).

NANDA is based on Human Response Patterns that has nine interaction models. The Nursing Interventions Classification (NIC) has 433 interventions in 27 classes for 6 domains [5]. In Taiwan, nurse will learned how to use NANDA for nursing diagnosis, and NIC to clarify nursing intervention.

An expert group verified the results. The ICNP Phenomena Classification described 87.5% of the NANDA diagnoses, 89.7% of the HHCC diagnoses and 72.7% of the Omaha System problem classification scheme. The ICNP Action Classification described 79.4% of the NIC interventions, 80.6% of the HHCC interventions and 71.4% of the Omaha System intervention scheme. The results of this study suggest that the ICNP has a sound starting structure for a unified nursing language system and can be used to describe most of the existing terminologies. Recommendations for the addition of terms to the ICNP are provided. [6]

But most nursing practitioner had been used NANDA nursing diagnosis that to describe nursing care and patient condition in Taiwan. That’s why more development computer system for nursing practice.[7]

3. Innovation Electronic Nursing Record pilot structure

We using three steps to develop the pilot structure for Innovation Electronic Nursing Record (Figure 1):

3.1. Retrospect patient record analysis

In this study, we are sampling three major clinical pathways at Urology ward in medical center such as Benign Prostate Hypertrophy (BPH), inguinal hernia, and Urinary tract stone as our major format.

We are find out 253 significant symptoms for five major nursing diagnoses since 100 patients each for three clinical pathways in past one year that sampling for retrospect record analysis. (See Table 2)
Table 2 • Significant symptom analysis[8]

<table>
<thead>
<tr>
<th>Nursing Diagnosis</th>
<th>significant symptom appear times</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Acute Pain</td>
<td>64</td>
</tr>
<tr>
<td>2. Risk for Infection</td>
<td>27</td>
</tr>
<tr>
<td>3. Impaired Urinary Elimination</td>
<td>45</td>
</tr>
<tr>
<td>4. Impaired Skin integrity</td>
<td>50</td>
</tr>
<tr>
<td>5. Risk for Falls</td>
<td>67</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>253</strong></td>
</tr>
</tbody>
</table>

The decision support rule builds by retrospect record analysis and expert committee. Through expert rule, these significant symptoms will distinguish by 3 categories to major, secondary, and minor. And every significant symptom will be set a weight score for these 3 categories. The diagnosis will be produced depend on that how many major, secondary, and minor appeared.

3.2. Integration standard for nursing taxonomy

We will integrate the taxonomy and code of NANDA, NIC, and ICNP is a relational database in these three clinical pathways for exchange different standard of ENR interface engine.

3.3. C. Building innovation Electronic Nursing Record (ENR) pilot structure

In the pilot structure, it includes nursing assessment, nursing diagnosis, nursing plan, and nursing record. We called to the Electronic Nursing Record (ENR).

The ENR pilot structure integrated clinical pathway from patient admission through discharge, There are ENR system portal (see Figure2), ENR system Main page (see Figure3), Demographic maintenance (see Figure4),
Nursing assessment interface (see Figure 5), Nursing care plan interface (see Figure 6), Ward maintenance interface (see Figure 7), Nursing diagnosis maintenance (see Figure 8), Nursing intervention maintenance (see Figure 9), Nursing Characteristics

A.T.-H. Hao et al. / Apply Creative Thinking of Decision Support in Electrical Nursing Record Maintenance (see Figure 10), Nursing assessment code interface (see Figure 11), Nursing diagnosis code maintenance (see Figure 12), and Decision support rule maintenance (see Figure 13).

4. Future works

To develop nursing care plan is helpful for personal interaction with in environment to got health. When set a nursing diagnosis will decide what nursing intervention to use. That is potential contribution of nursing diagnosis[9].

Under challenge in DRG, nursing care model will toward to case management style. Therefore, the nursing care planning system will base on case management. Such as Clinical pathway that clarify important exam, treatment, health education, and care plan in everyday from patient admission through discharge.

We will build up the whole ENR system based on the pilot structure in coming year and hope to bring the new goal in nursing informatics development in Taiwan.

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References

