Progress Application of CCC in China R&D and Application of Intelligent Nursing Information System Based on the CCC Nursing Knowledge Base

Yang Lei, Chung Peilong etc.
HeNan Honliv Hospital
2019.12.5
Contents in 2017 CCC user meeting

1. Goals (introducing CCC in China)
2. Background of CCC in China
3. Why choose CCC
4. Progress in introducing CCC in China
5. Difficulties faced
Contents

1. Goals of CCC Research Team in China
2. opportunities and challenges of CCC in China
3. Progress of CCC used in China in the past 2 years
4. The future development of CCC in China
Our CCC Research and Use Team

• National Institute of Hospital Administration, National Nursing Center
• Zhongwei Institute of Nursing Information
  • CCC Working Group for Evidence-based Evidence Knowledge Base
• Henan Hongliv Hospital
  • Software R&D Team
  • Nursing Management Team
  • Nursing Management Team
  • Scientific Research Statistics Team
Dr JIAN Wei Yan, Associate Professor of Health Management and Policy at the Peking University Health Sciences Center

Yang Lei, Vice President of HeNan Honliv hospital, ICU Executive Director, Member of Quality Indicators Research Group of the National Nursing Quality Control Center, Vice chairman of National League for Nursing Quality Improvement

Prof. Yao li, Director of Nursing Center of National Institute of Hospital Administration. Director of National Nursing Quality Control Center.
R&D Team of CCC All Intelligent Nursing Information System

Leader
Prof. CHUNG, PEI LUNG
1. **Goals of CCC Research Team in China**
Goals

1. Building an CCC evidence-based nursing knowledge database
2. R&D CCC Intelligent Nursing Information System
3. Use CCC in China nursing in patient care
4. Enable more Chinese hospital to apply CCC
5. Create CCC nursing big data

Standard nursing information → Nursing big data → Knowledge for nursing → SMART nursing
2. The opportunities and challenges of CCC in China
 Nearly 1.4 billion population

At the end of June 2017, the number of medical institutions reached 997434.

At the end of 2018, 33 thousand hospitals, including 12,032 public hospitals, 20,977 private hospitals.

At the end of 2018, There are 4.5 million nurses in China
China is faced with some opportunities and challenges

1. China has 1.4 billion people who need care
2. China’s aging population is getting larger and larger.
China is faced with some opportunities and challenges

- China has taken the health of citizens as a national strategy
- Committed to establishing a full-life-cycle care system, including health management, chronic disease patient management, home care, and elderly care.
China is faced with some opportunities and challenges.
3. Introducing CCC in China

① R&D of CCC-based clinical nursing knowledge base

② Research and Develop CCC-based Intelligent Nursing Information system

③ Advance of the Application of CCC in Chinese Hospitals

... Etc.
ZhongWei Institute of Nursing Information
Clinical Nursing Knowledge Base 1.0
ZW-CNK1.0

ZHONGWEI INSTITUTE OF NURSING INFORMATION
The Necessity of Developing China-CCC

Some CCC terms do not meet the actual situation of Chinese nursing.

The content of the measures is not detailed enough and lacks practical guidance.

The logic system of the entire nursing process is not fully constructed.
Clinical Nursing Knowledge base launch meeting
Knowledge base audit expert
Knowledge base revise author

The information of experts and authors in the knowledge base of Obstetrics and Gynecology and pediatrics is being collected in succession......
Current results of clinical nursing knowledge base

Focus on 176 nursing problems
Focus on 7 nursing sensitive indicators
Mainly for the prevention of various types of adverse events

PESRGI model


3717 Nursing Interventions

ZW-CNk1.0 (first edition)

1147 Standard nursing interventions

Standardization
Characteristics of ZW-CNK1.0

- 1147 Nursing interventions
- 1213 Evidence-based literature
- 165 Types of nursing interventions
- 707 English literature
- 4 Action types
- 496 Chinese literature

Evidence-based level of nursing interventions

- Level 1: 701.51%
- Level 2: 286.21%
- Level 3: 134.10%
- Level 4: 138.10%
- Level 5: 114.8%
Knowledge base content - nursing problems

- Nursing problems in 176 CCC nursing terms (list only in the picture)
According to the sensitive quality indicators of nursing
7 bundle care nursing intervention base on CCC

- Protective constraints
- Fall prevention
- VAP
- CAUTI
- CLABSI
- PI
- Prevent unplanned unplugging
- Prevent unplanned unplugging
Knowledge base content - Nursing Interventions

- 3717 text nursing measures for nurses
- 1160 standardized nursing measures for nursing information system
- Nursing measures cover hundreds of evaluation scales, among which the scales commonly used in clinical practice are as follows:

<table>
<thead>
<tr>
<th>Scale Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F Vie (Fatigue Severity Scale)</td>
<td>Fatigue severity assessment</td>
</tr>
<tr>
<td>SF-36</td>
<td>Health assessment scale</td>
</tr>
<tr>
<td>BDI (Beck Depression Inventory)</td>
<td>Depression assessment scale</td>
</tr>
<tr>
<td>HADS (Hospital Anxiety and Depression Scale)</td>
<td>Anxiety and depression assessment scale</td>
</tr>
<tr>
<td>BDI-II</td>
<td>Depression assessment scale</td>
</tr>
<tr>
<td>BDI-6 (6 items)</td>
<td>Depression assessment scale</td>
</tr>
<tr>
<td>GDS (Geriatric Depression Scale)</td>
<td>Depression assessment scale</td>
</tr>
<tr>
<td>GAS (Geriatric Assessment Scale)</td>
<td>Geriatric assessment scale</td>
</tr>
<tr>
<td>CMS</td>
<td>Care outcomes scale</td>
</tr>
<tr>
<td>HAPI-65 (65 items)</td>
<td>Hospital patient satisfaction scale</td>
</tr>
<tr>
<td>C-PAS (Cancer Patient Assessment Scale)</td>
<td>Cancer patient assessment scale</td>
</tr>
<tr>
<td>DSAS-XS</td>
<td>Delirium assessment scale</td>
</tr>
<tr>
<td>MMSE</td>
<td>Mini-Mental State Examination</td>
</tr>
<tr>
<td>ADL (Activities of Daily Living)</td>
<td>Functional ability assessment scale</td>
</tr>
<tr>
<td>Barthel</td>
<td>Functional ability assessment scale</td>
</tr>
<tr>
<td>IADL</td>
<td>Instrumental activities of daily living assessment scale</td>
</tr>
<tr>
<td>ADL</td>
<td>Activities of daily living assessment scale</td>
</tr>
<tr>
<td>GDS-9</td>
<td>Depression assessment scale</td>
</tr>
<tr>
<td>GAS</td>
<td>Geriatric assessment scale</td>
</tr>
<tr>
<td>RASS</td>
<td>Richmond Agitation-Sedation Scale</td>
</tr>
</tbody>
</table>

These scales are used to assess and monitor the health and functional status of patients in clinical practice.
Knowledge base content - references

• 1213 evidence-based documents: 707 in English
• The following is a screenshot of some documents:
Construction of clinical nursing knowledge base: ESR-PGIO model

- **E**: Etiology
- **S**: Sign and Symptom/Defining Characteristics
- **R**: Related Factors/Risk Factors
- **P**: Nursing Problems
- **G**: Nursing goals
- **I**: Nursing Interventions
- **O**: Nursing outcome

From Assessment to diagnosis

From diagnosis to nursing interventions

Measures to results

Result reevaluation

Build the knowledge base through evidence-based
Knowledge base coverage

Assessment database

- More than 1000 Assessment projects
- Nearly 100 Assessment scales

Nursing Problems database

- 176 CCC nursing problems
- 7 nursing measures of nursing sensitive indexes

Special edition of CCC nursing problems

Nursing Interventions database

- 1147 Nursing Interventions
- 1213 evidence-based documents
Current progress of knowledge base

100% complete
internal and external medicine

- 176 CCC nursing problems
- ……

100% complete
Nursing risk

- Seven nursing risk intensive nursing measures
- ……

60% Soon to complete
Obstetrics and Gynecology

- 51 nursing problems in obstetrics and Gynecology
- 89 pediatric care issues……

10% Yet to start
Home care

- Home care knowledge base ……
## Maintenance of ZW-CNK

### Maintenance team
- Revision team
- Review team

### Maintenance content
- Further optimization of content
- Meet the needs of the specialist

### Maintenance time
- The content of the question is updated in a timely manner
- Normalization regular update
Research and development of nursing information system based on CCC (CCC ZW-CNK)
Overall Architecture of the Holistic Intelligent Nursing Information System

Clinical nursing

- Patient List
- Responsible Nurse Scheduling
- Nursing Records
- Special Nursing
- Nursing Evaluation
- Nursing Care
- Nursing Plan
- Tended Object
- International Standard
  Nursing Terminology
  Nursing knowledge base

Nursing Management

- Nursing Staff Management
- Shift Management
- Nursing Quality Control
- Nursing Post management
- Responsible Nursing Scheduling
- Nursing Assessment
- Nursing Plan
- Nursing Execution
- Special Nursing
- Nursing Evaluation
- Record Editing
- Nursing Shift
- Discharge Nursing
- Nursing Record Query
- Statistical Analysis (Administrative Authority)
### S-现状

<table>
<thead>
<tr>
<th>病情</th>
<th>体征</th>
<th>体重</th>
<th>身高</th>
<th>年龄</th>
<th>性别</th>
<th>生活习惯</th>
<th>过敏史</th>
<th>纠约情况</th>
<th>排泄情况</th>
<th>营养状况</th>
<th>睡眠情况</th>
<th>疼痛情况</th>
<th>精神状态</th>
<th>意识状态</th>
</tr>
</thead>
<tbody>
<tr>
<td>45℃</td>
<td>120/80mmHg</td>
<td>55kg</td>
<td>170cm</td>
<td>50岁</td>
<td>女</td>
<td>无吸烟饮酒</td>
<td>无过敏史</td>
<td>无预约</td>
<td>无便秘</td>
<td>良好</td>
<td>无失眠</td>
<td>中度疼痛</td>
<td>良好</td>
<td>醒目，对答如流</td>
</tr>
</tbody>
</table>

**症状描述：**
患者体温45℃，血压120/80mmHg，心率80次/分，呼吸20次/分，无痛觉反应。

**伤口情况：**
左下肢伤口2处，无渗液；右下肢伤口3处，无渗液。

**皮肤情况：**
左下肢肿胀，无红肿；右下肢肿胀，无红肿。

**其他情况：**
无其他异常。

### B-背景

- 皮肤外伤，其他，高血压，肾病，糖尿病

### R-建议

- 营养：患者近日食欲下降，建议予以高蛋白饮食。
- 体征：患者今日体温37.8℃，建议予以物理降温。
- 意识：患者今日精神欠佳，建议予以心理支持。

### 人形图

- Sbar Intelligent Shift

### 评估-A

<table>
<thead>
<tr>
<th>风险评估</th>
<th>分数</th>
<th>建议</th>
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<td>Braden评分风险评估</td>
<td>14</td>
<td>中度危险</td>
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<tr>
<td>移动能力风险评估</td>
<td>14</td>
<td>高度危险</td>
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<tr>
<td>Caprini静脉血栓风险评估</td>
<td>21</td>
<td>高度危险</td>
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<tr>
<td>Padua静脉血栓风险评估</td>
<td>21</td>
<td>高度危险</td>
</tr>
<tr>
<td>ADL生活活动能力评估</td>
<td>40</td>
<td>重度依赖</td>
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</table>
Automatic generation of nursing medical records

Hunan Hengyi Hospital Nursing Record Sheet

- Patient Name: Gao Yan
- Gender: Female
- Age: 38
- Room: 302
- Date of Admittance: 2019-05-26

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Temperature (°C)</th>
<th>Pulse (bpm)</th>
<th>Respiration (bpm)</th>
<th>收缩压 (mmHg)</th>
<th>舒张压 (mmHg)</th>
<th>Nursing Measures</th>
<th>Executor</th>
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<td>Performed nursing assessment</td>
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<td>2019-05-27</td>
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<td>2019-05-28</td>
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<td>2019-05-28</td>
<td>04:00</td>
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<td>Nursing actions by nurse Li Jianyang</td>
<td>Li Jianyang</td>
</tr>
</tbody>
</table>

Diagnosis: Left lower limb fracture
Hospital No: 00263050
4、The future development of CCC in China
Relative value points of Nursing measures

TIME + physical strength + Brain power + Medical risk = value

Learn from the relevant experience of RBRVS

Equipped with nursing staff based on patient needs

Rational allocation of nursing manpower

Reasonable allocation of male nurses

Reasonable allocation of high-educated nurses

Reasonably configure different levels of nurses

Scientific measurement of nurse workload

Salary Configuration More work and more rewards
ZW-CNK maps other term

Correction of the feasibility

Recommended nursing problems and measures based on disease

Meet some nurses' usage habits

Meet some nurses' usage habits

mapping

4th Clinical Care Classification (CCC) User Meeting
We are looking forward to more opportunities to promote win-win development in close cooperation.
Thanks for your attention

Welcome to China
yanglei@honliv.com

4th Clinical Care Classification (CCC) User Meeting