

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

4th Clinical Care Classification (CCC) User Meeting



Contents in 2017 CCC user meeting

1. **Goals (introducing CCC in China)**
2. **Back ground 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



河南宏力集团董事长 



Dr JIAN Wei Yan, Associate Professor of Health Management and Policy at the Peking University Health Sciences Center

Prof. Yao li, Director of Nursing Center of National Institute of Hospital Administration. Director of National Nursing Quality Control Center.

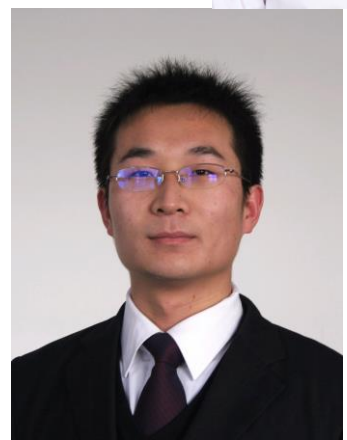


Yang Lei, Vice President of HeNan Honliv hospital, ICU Executive Director
Member of Quality Indicators Research Group of the National Nursing Quality Control Center, Vice chairman of National League for Nursing Quality Improvement

R&D Team of CCC All Intelligent Nursing Information System



Leader
Prof. CHUNG, PEI LUNG



1. Goals of CCC Research Team in China

Goals

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



2. The opportunities and challenges of CCC in China



Back ground

Medical institutions 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

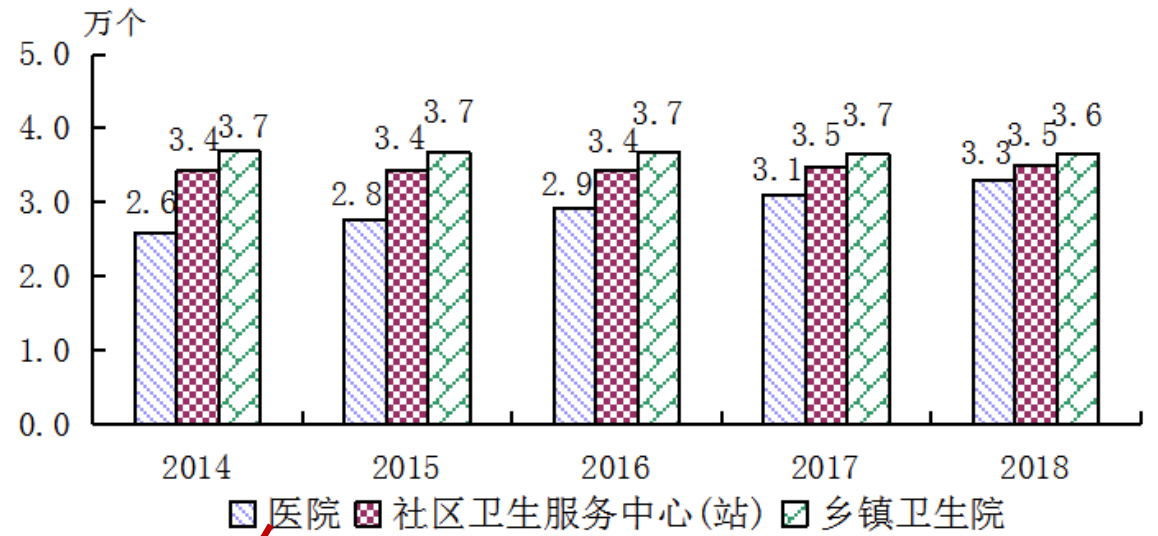


图1 全国医疗卫生机构数

hospital

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 established 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

Big data



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.

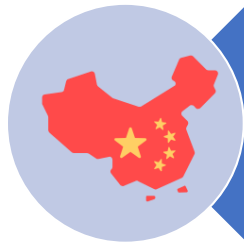


ZhongWei Institute of Nursing Information Clinical Nursing Knowledge Base1.0

ZW-CNK1.0

ZHONGWEI INSTITUTE OF NURSING INFORMATION

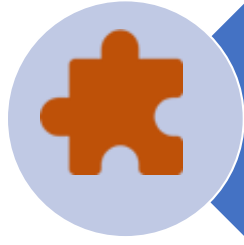
The Necessity of Developing China-CCC



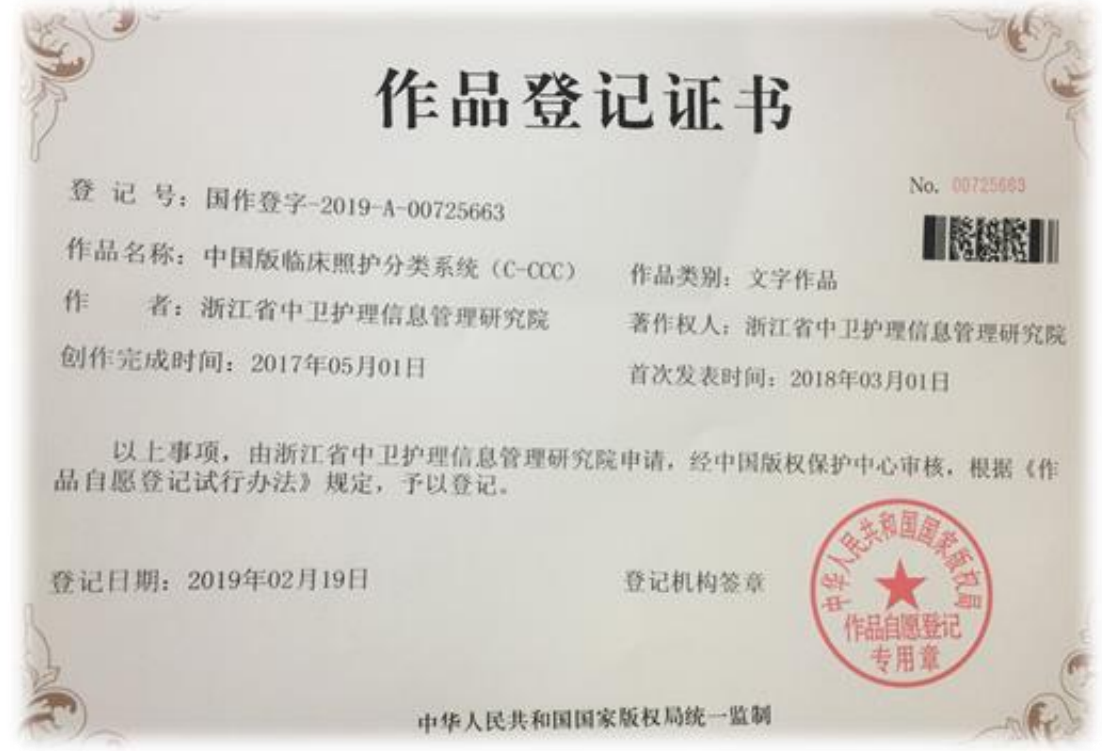
Some CCC terms do not meet the actual situation of Chinese nursing



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.



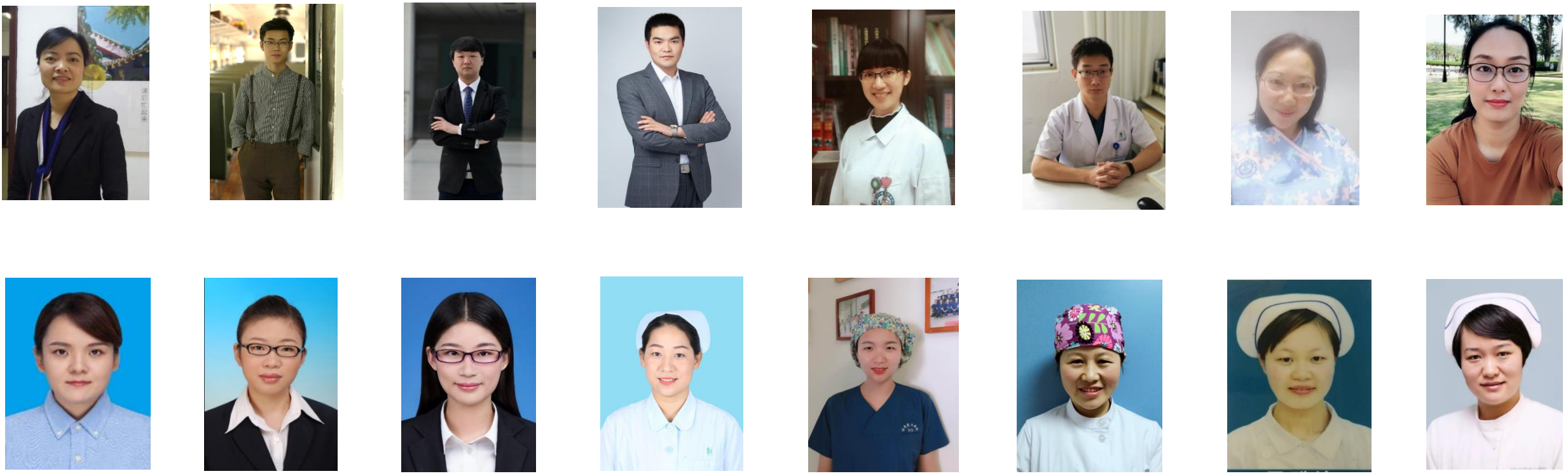
Clinical Nursing Knowledge base launch meeting



Knowledge base audit expert

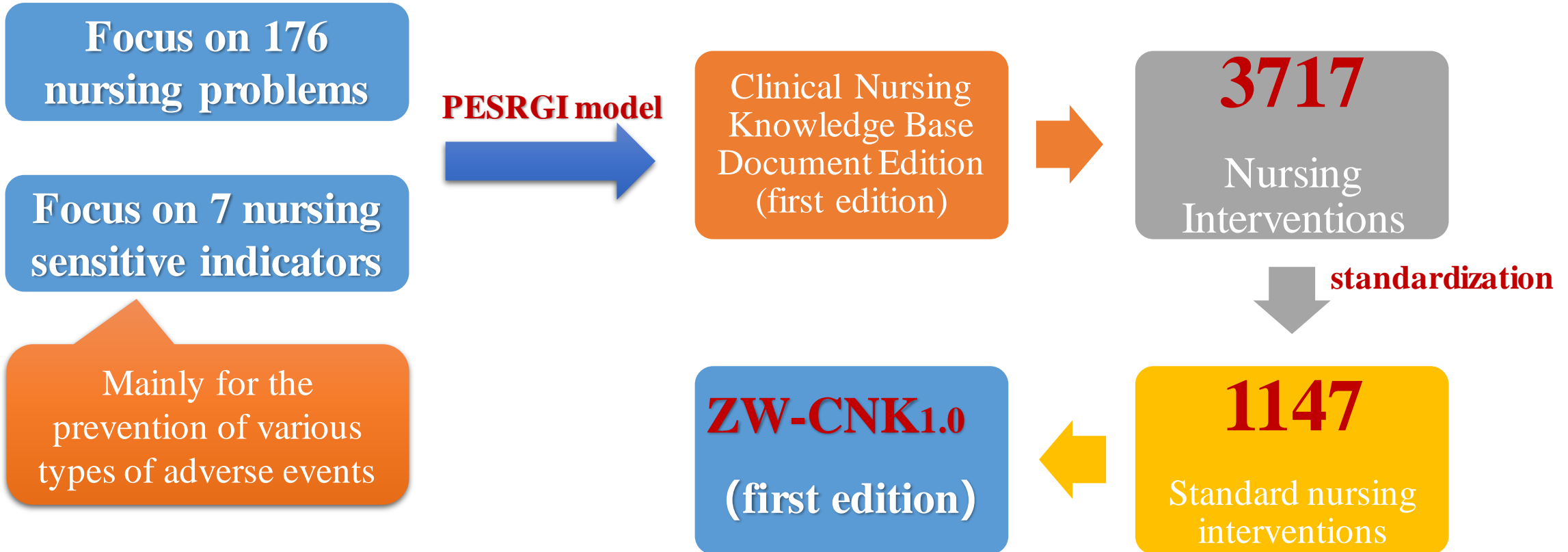


Knowledge base revise author



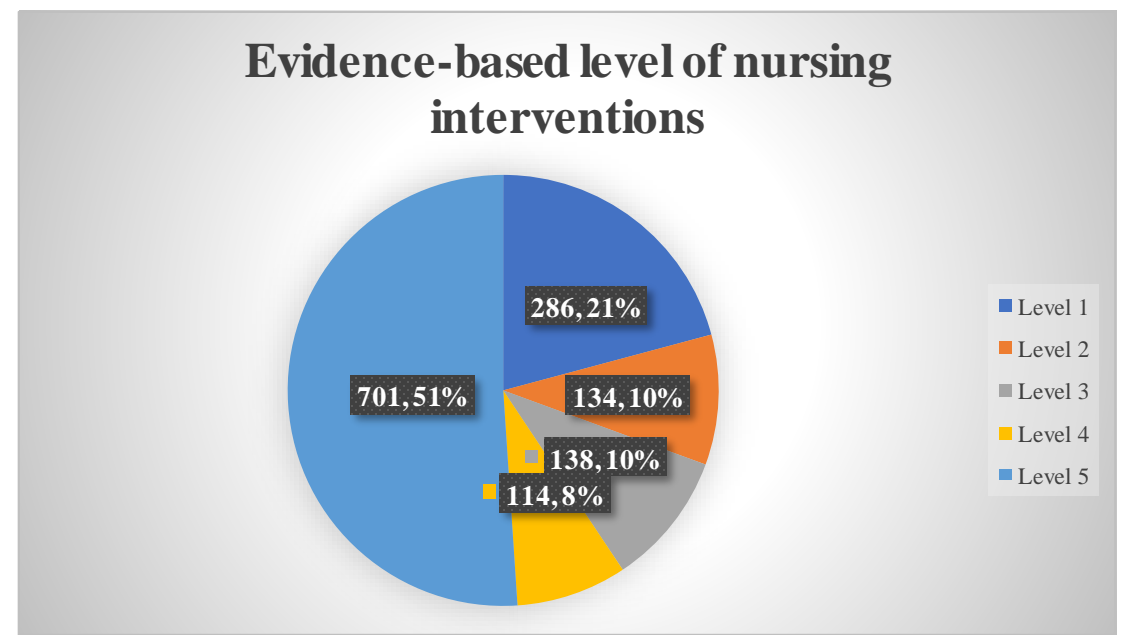
The information of experts and authors in the knowledge base of Obstetrics and Gynecology and pediatrics is being collected in succession.....

Current results of clinical nursing knowledge base



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



Knowledge base content - nursing problems

- Nursing problems in 176 CCC nursing terms (list only in the picture)

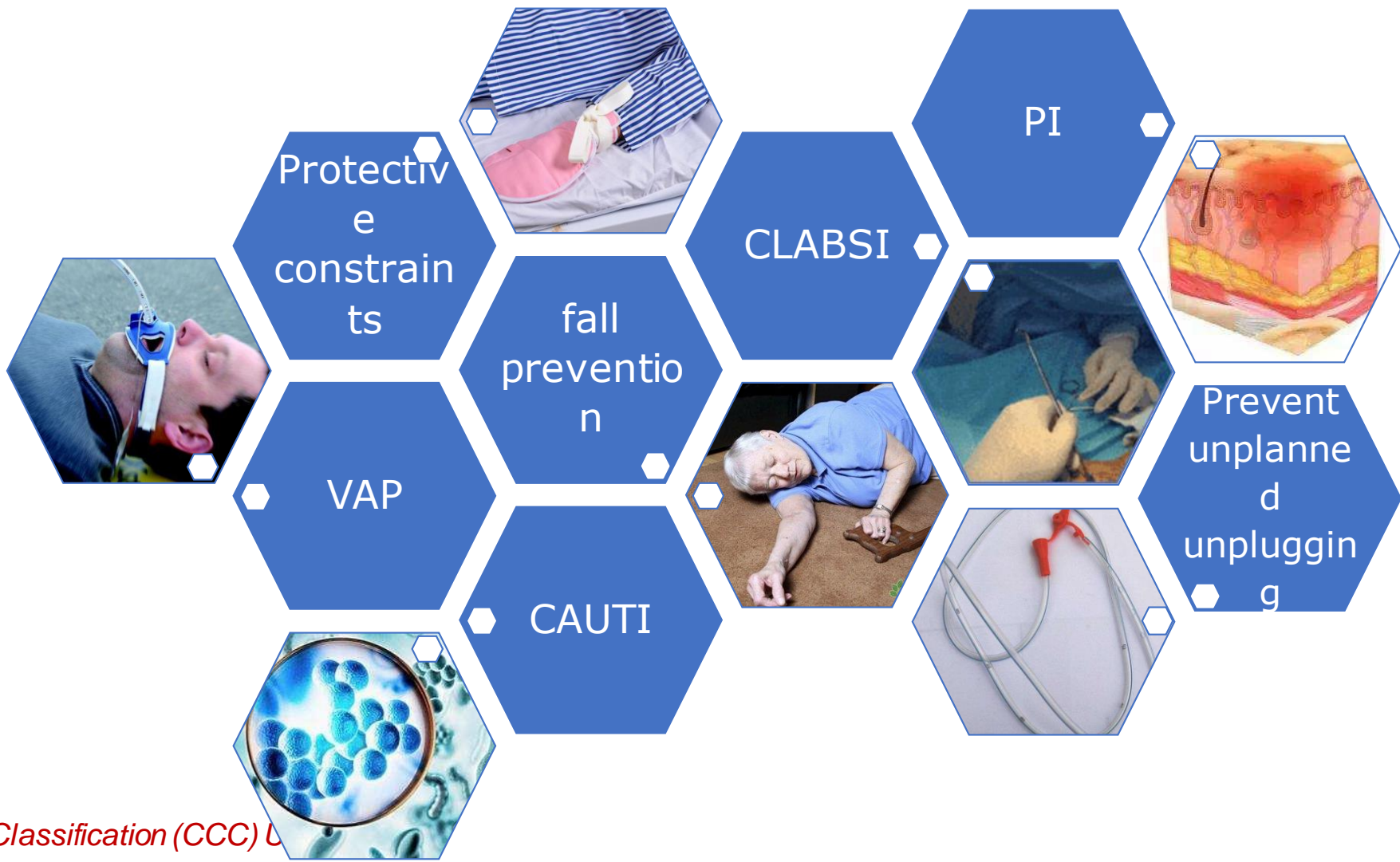
序号	分类	分类码	编码	护理问题
1	活动 Activity	A	01.0	活动改变 Activity Alteration
2	活动 Activity	A	01.1	活动无耐力 Activity Intolerance
3	活动 Activity	A	01.2	活动无耐力风险 Activity Intolerance Risk
4	活动 Activity	A	01.3	娱乐活动缺乏 Diversional Activity Deficit
5	活动 Activity	A	01.4	疲惫 Fatigue
6	活动 Activity	A	01.5	身体活动功能障碍 Physical Mobility Impairment
7	活动 Activity	A	01.6	睡眠模式紊乱 Sleep Pattern Disturbance
8	活动 Activity	A	01.7	睡眠剥夺 Sleep Deprivation

11	肠/胃 Bowel/Gastric	B	03.1	排便失禁 Bowel Incontinence
12	肠/胃 Bowel/Gastric	B	03.3	腹泻 Diarrhea
13	肠/胃 Bowel/Gastric	B	03.4	粪便梗阻 Fecal Impaction
14	肠/胃 Bowel/Gastric	B	03.5	感知性便秘 Perceived Constipation
15	肠/胃 Bowel/Gastric	B	03.6	便秘 Constipation
16	肠/胃 Bowel/Gastric	B	04.0	胃肠道改变 Gastrointestinal Alteration
17	肠/胃 Bowel/Gastric	B	04.1	恶心 Nausea
18	肠/胃 Bowel/Gastric	B	04.2	呕吐 Vomiting
19	心脏循环 Cardiac	C	05.0	心输出量改变 Cardiac Output Alteration
20	心脏循环 Cardiac	C	06.0	心血管改变 Cardiovascular Alteration

序号	分类	分类码	编码	护理问题
21	心脏循环 Cardiac	C	06.1	血压改变 Blood Pressure Alteration
22	心脏循环 Cardiac	C	06.2	出血风险 Bleeding Risk
23	认知/神经 Cognitive/Neuro	D	07.0	脑部改变 Cerebral Alteration
24	认知/神经 Cognitive/Neuro	D	07.1	混乱/模糊 Confusion
25	认知/神经 Cognitive/Neuro	D	08.0	知识缺乏 Knowledge Deficit
26	认知/神经 Cognitive/Neuro	D	08.1	诊断知识缺乏 Knowledge Deficit of Diagnostic Test
27	认知/神经 Cognitive/Neuro	D	08.2	饮食方案知识缺乏 Knowledge Deficit of Dietary Regimen
28	认知/神经 Cognitive/Neuro	D	08.3	病程知识缺乏 Knowledge Deficit of Disease Process
29	认知/神经 Cognitive/Neuro	D	08.4	体液容积知识缺乏 Knowledge Deficit of Fluid Volume
30	认知/神经 Cognitive/Neuro	D	08.5	用药知识缺乏 Knowledge Deficit of Medication Regimen

According to the sensitive quality indicators of nursing

7 bundle care nursing intervention base on CCC



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:

措施细分类名称	措施内容
患者对锻炼的结果期望值	使用结果期望运动量表(Outcome Expectation for Exercise Scale)
患者对锻炼的自我效能感	使用身体锻炼自我效能量表(Self-Efficacy for Exercise Scale)
睡眠质量	1.睡眠评价量表 (ESS) 2.失眠严重程度指数 (ISI) 3.匹兹堡睡眠质量指数(PSQI)
失眠相关测评量表	疲劳严重程度量表 (Fatigue Severity Scale) 生活质量问卷 (SF-36)
腹泻情况	Hart and Dobb腹泻量表 (Hart and Dobb Diarrhea Scale) /粪便排泄评估工具 (the Guenther and Sweed Stool Output Assessment Tool) /布里斯托尔粪便量表 (the Bristol Stool Scale) /腹泻等级量表 (Diarrhea Grading Scale)
HAMD (汉密尔顿抑郁量表)	采用HAMD (汉密尔顿抑郁量表) 对患者抑郁程度进行评价, 共17项检测内容, 评分法为0分~4分的5级评分方法, 具体如下: 0分为无, 1分为轻度, 2分为中度, 3分为重度, 4分为极重度
焦虑量表 (FAS)	可采用焦虑量表 (Face Anxiety Scale, FAS)
焦虑自评量表 (SAS)	焦虑自评量表 (SAS)
老年抑郁量表 (GDS)	老年抑郁量表 (GDS)
抑郁自评量表 (SDS)	抑郁自评量表 (SDS)
住院患者焦虑抑郁量表 (HADS)	可采用住院患者焦虑抑郁量表, Hospital Anxiety and Depression Scale, HADS[3]
糖尿病足溃疡患者无能为力感	糖尿病足溃疡无能为力感量表
营养风险筛查量表-2002 (NRS-2002)	营养风险筛查量表-2002 (NRS-2002)
患者主观整体评估量表 (PG-SGA)	患者主观整体评估量表 (Patient-Generated Subjective Global Assessment, PG-SGA)
微型营养评估量表 (MNA)	微型营养评估量表 (MNA)
Braden评分	使用Braden评估量表评估患者压力性损伤风险
Waterlow量表	Waterlow量表
使用其他压力性损伤风险评估量表	其他压力性损伤风险评估量表

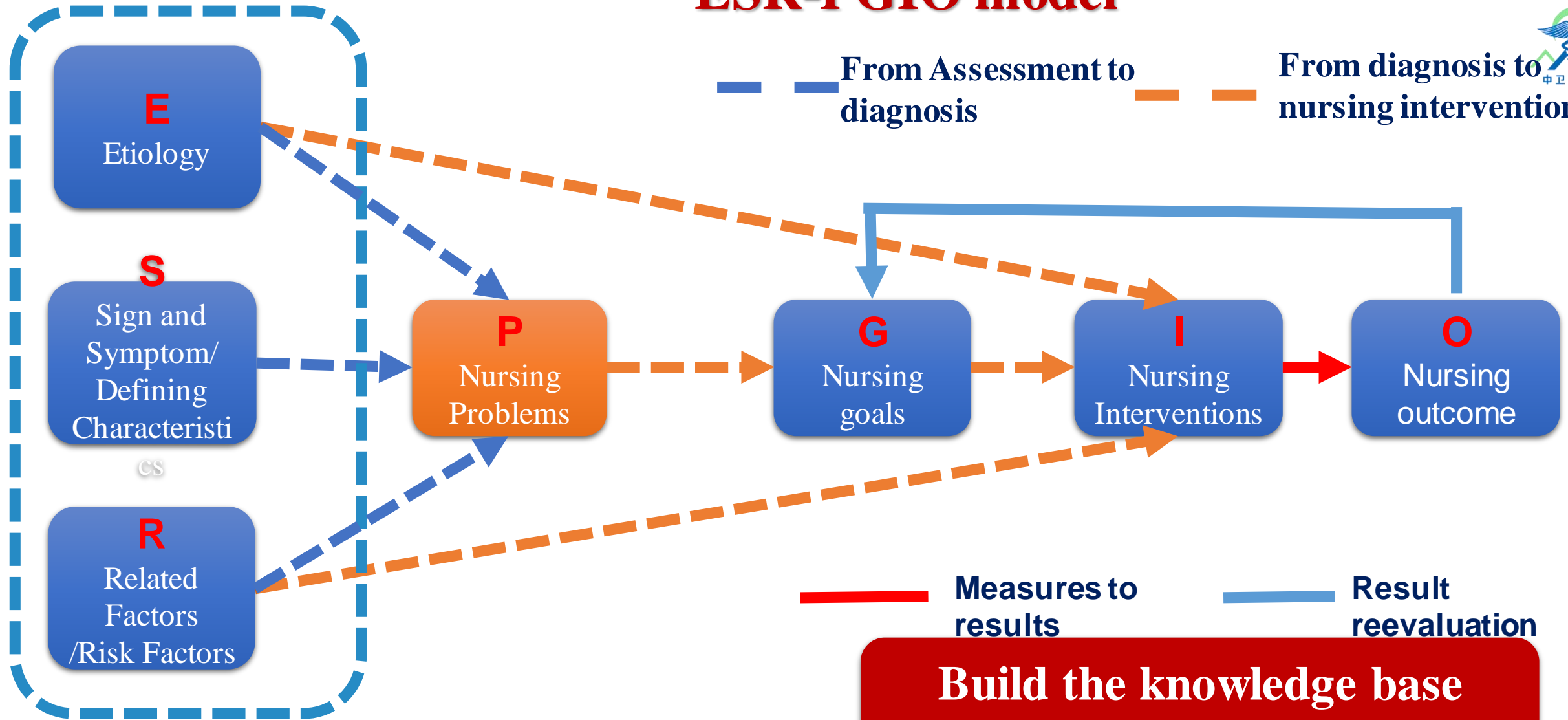
疲惫程度	情绪状态简表疲劳分量表(Profile of Mood State Short Form Fatigue Subscale), 疲劳多维评估量表(the Multidimensional Assessment of Fatigue), 李氏疲劳量表(the Lee Fatigue Scale), 多维疲劳量表(the Multidimensional Fatigue Inventory), HIV相关疲劳量表(the HIV- Related Fatigue Scale), 简明疲劳量表(the Brief Fatigue Inventory)或荷兰疲劳量表(the Dutch Fatigue Scale to assess fatigue accurately)
Richmond躁动-镇静量表(RASS)	Richmond躁动-镇静量表 (Richmond Agitation-Sedation Scale, RASS)
尼古丁依赖程度	尼古丁依赖检验量表
酒精滥用情况	酒精使用评定量表(AUDIT, ASSIST)
跌倒评估-Berg平衡量表 (BBS)	Berg平衡量表 (BBS)
自杀风险	自杀风险因素评估量表: ≤5 分为低风险, 6 ~ 8 分为中度风险, 9 ~ 11 分为高风险, ≥ 12 分为极高风险。≥9 分列为护士重点关注对象。抑郁筛查量表 (PHQ-2) /ED-SAFE患者安全筛查问卷 (ED-SAFE Patient Safety Screener) /自杀行为问卷修订版 (Suicide Behaviors Questionnaire-Revised, SBQ-R)
ADL量表	ADL量表 (进食、洗澡、修饰、穿衣、控制大便、控制小便、如厕、床椅转移、平地行走、上下楼梯)
Barthel指数量表	Barthel指数量表
IADL量表	IADL评估量表
晚期癌症患者预感性悲伤量表(PGAC)	晚期癌症患者预感性悲伤量表((Preparatory Grief in Advanced Cancer Patien, PGAC): PGAC含有3 1个条目, 七个维度, 分别是自我意识、疾病调整、悲伤、愤怒、宗教安慰、躯体症状、感知到的社会支持, 用于深度评估和调整患者的悲伤反应。该量表采用0-3四分法, 0代表不同意, 3代表同意, 总得分越高, 患者经历的悲伤越多。
评估痴呆程度	临床痴呆评定量表 (CDR)
认知功能	简易智力状态检查量表 (MMSE)
疼痛评估-CPOT	重症监护室疼痛观察工具法 (CPOT量表)
疼痛评估-FLACC	无法自我报告疼痛的婴儿及儿童/FLACC量表
疼痛评估-NRS	数字疼痛强度量表 (NRS)
疼痛评估-VRS	疼痛强度简易描述量表 (VRS)

Knowledge base content - references

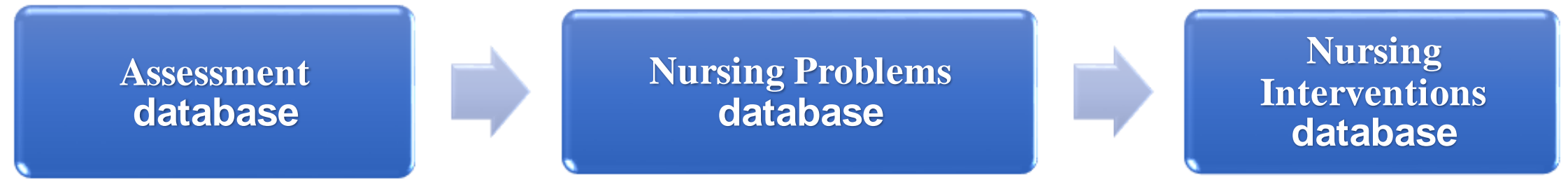
- 1213 evidence-based documents: 707 in English
- The following is a screenshot of some documents:

Block J, Lilienthal M, Cullen L, et al. Evidence-based thermo-regulation for adult trauma patients[J]. Crit Care Nurs Q, 2012, 35(35): 50-63.
Beeckman D. Journal of Behavior Therapy & Experimental Psychiatry, 2012, 43(2):844-848.
Bomyea J, Amir N, Lang A J. The relationship between cognitive control and posttraumatic stress symptoms. [J]. Journal of Behavior Therapy & Experimental Psychiatry, 2012, 43(2):844-848.
Bonsaksen, T., et al., Differences and similarities in the trajectories of self-esteem and positive and negative affect in persons with chronic illness: an explorative longitudinal study. Journal of multidisciplinary healthcare, 2016. Volume
Behnia M, C Boots LM, Wolfs CA, Verhey FR, et al. Qualitative study on needs and wishes of early-stage dementia caregivers: The paradox between needing and accepting help [J]. Int Psychogeriatr, 2015, 27(6):927-936.
Bennett DA, Bostwick JM,Levenson, JL: Suicidality. The AmericanPsychiatry Publishing Textbook of Psychosomatic Medicine, Washington, D. C.,American Psychiatric Publishing, 2005;219-234
Berbis-More grounded th Bott, J., et al., Guidelines for the physiotherapy management of the adult, medical, spontaneously breathing patient.
Berg C, Lap Bozzetti F, Mariani L. Perioperative nutritional support of patients undergoing pancreatic surgery in the age of ERAS
Bergkvist M Braga CG,da Cruz Dde A.Powerlessness Assessment tool for adult patients[J].Rev Esc Enferm USP,2009,43(4):1063-1070
Bergkvist M promising t Braun-Lewensohn O, Sagi S, Sabato H, Galili R.Sense of coherence and sense of community as coping resources of religious adolescents before and after the disengagement from the Gaza Strip. Isr J Psychiatry Relat Sci. 2013;50(2):110-7.
Bernardini pediatric p Breitbart W, Poppito S, Rosenfeld B, et al. Pilot randomized controlled trial of individual meaning-centered psychotherapy for patients with advanced cancer[J]. J Clin Oncol, 2012,30(12):1304-1309.
Bernardini pediatric p Breitbart W, Rosenfeld B, Gibson C, et al. Meaning-centered group psychotherapy for patients with advanced cancer: a pilot randomized controlled trial[J]. Psycho-Oncology, 2010,19(1):21-28.
Bernardini pediatric p Breitbart W, Rosenfeld B, Pessin H, et al. Meaning-centered group psychotherapy: an effective intervention for improving psychological well-being in patients with advanced cancer[J]. J Clin Oncol, 2015,33(7):749-754.
Bernardini pediatric p Breivik H, Reme S E, Linton S J. High risk of depression and suicide attempt among chronic pain patients: Always explore catastrophizing and suicide thoughts when evaluating chronic pain patients[J]. Scandinavian Journal of Pain, 2014,
Bernardini pediatric p Brennan M R, Milne C T, Agrellkann M, et al. Clinical Evaluation of a Skin Protectant for the Management of Incontinence-Associated Dermatitis: An Open-Label, Nonrandomized, Prospective Study. [J]. Journal of Wound Ostomy & Continen Nursing Official Publication of the Wound Ostomy & Continence Nurses Society, 2017, 44(2):172-180.

Construction of clinical nursing knowledge base: ESR-PGIO model



Knowledge base coverage



More than
1000 Assessment projects

Nearly **100** Assessment scales

176 CCC nursing problems

7 nursing measures of nursing sensitive indexes

Special edition of CCC nursing problems

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

Nursing Management



- Nursing Staff Management
- Shift Management
- Nursing Quality Control
- Nursing post management



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简体中文 ▼

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- 责护派班
- 护理评估
- 护理诊断
- 护理计划
- 护理执行
- 专项护理
- 护理评价
- 记录编辑
- 护理交班
- 出院护理
- 记录查询
- 统计分析

病人总数32 一级护理29 二级护理3 压疮风险-极2 导管1

在院病人 | 标记视图

请输入床号、姓名、病案号 图标 小图标 列表

- 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)

13	李志敏	住院号: 10143221	入院日期: 2019-2-8	主治医生: 葛园园	责任护士:
21	王易会	住院号: 10485452	入院日期: 2019-2-8	主治医生: 杨其武	责任护士:
30	崔朋贺	住院号: 10550058	入院日期: 2019-2-8	主治医生: 靳亚飞	责任护士:
42	朱新哲	住院号: 10315407.2	入院日期: 2019-1-17	主治医生: 靳亚飞	责任护士:
17	女 72岁	0197036.1	2019-2-8 34	靳亚飞	
18	女 30岁	韩雪云	00481209.3	2019-1-28 45	杨其武
26	女 72岁	0546003.1	2019-1-23 50	靳亚飞	
27	女 82岁	于寸英	00679661.3	2019-2-7 35	杨其武
33	男 78岁	0544347.1	2019-1-16 57	张心磊	
34	男 66岁	范世勋	10292111.1	2019-2-2 40	刘珍珍
+4	女 62岁				
+6	女 40岁	尚甫红	10550266.1	2019-2-8 34	

- 责护派班
- 护理评估
- 护理诊断
- 护理计划
- 护理执行
- 专项护理
- 护理评价
- 记录编辑
- 护理交班
- 出院护理
- 记录查询
- 统计分析



赵玉娣
女 56岁

病历号	入院时间	血型	过敏	护理级别	诊断	主治医师	主护
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00179796	2019-06-03			一级护理	左小腿骨筋膜间室综合征	马彦飞	张锦
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S-现状

生命体征:
 患者体温:37.8℃ ;收缩压:137/;舒张压:83mmHg ;脉率:80次/分;呼吸:20次/分; 疼痛评分:1分
伤口情况:
 左侧嘴角伤口,无渗液;
 左小腿中间伤口,无渗液;
 左小腿中间伤口,无渗液;
 右膝外侧伤口,无渗液;
 右足背内侧伤口,无渗液;

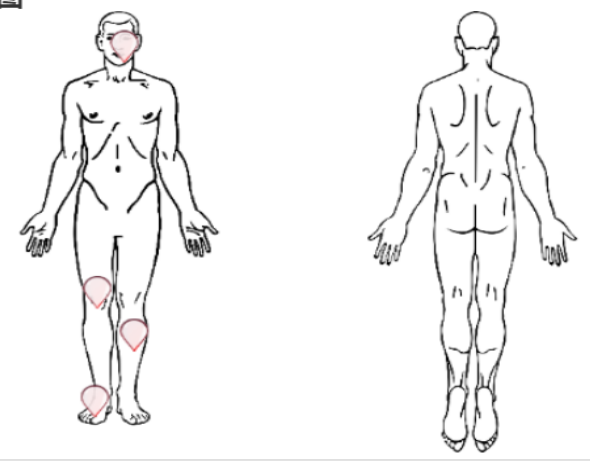
B-背景

皮肤外伤,其他,高血压,胃部疾病

R-建议

目标: 患者左足感觉减弱,足背动脉搏动良好。患者今日尿常规示大肠埃希菌细菌感染,各班次注意床旁隔离,指导患者多饮水,患者日间体温37.8℃

人形图



评估-A

风险评估	分数	建议
Braden压疮风险评估量	14	中度危险
圣托马斯跌倒风险评估	14	
Caprini 静脉血栓风险评估量表	21	高危险
Padua静脉血栓风险评估	21	高危
ADL生活活动能力量表	40	重度依赖

SBAR Intelligent

Shift

- 责护派班
- 护理评估
- 护理诊断
- 护理计划
- 护理执行
- 专项护理
- 护理评价
- 记录编辑
- 护理交班
- 出院护理
- 记录查询
- 统计分析

ID: 10577558

姓名: 高艳红
性别: 女
生日: 1980-10-12

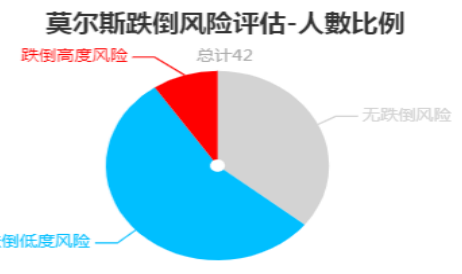
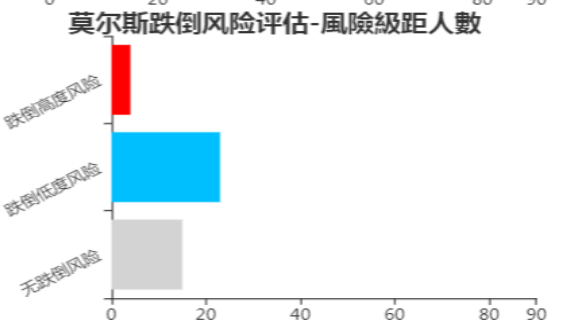
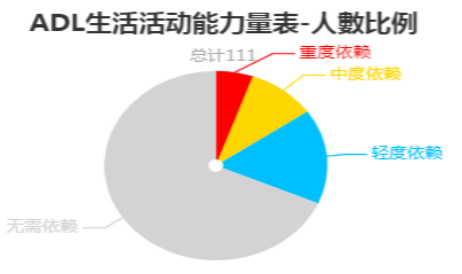
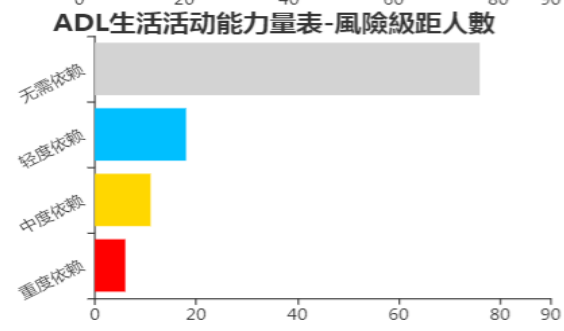
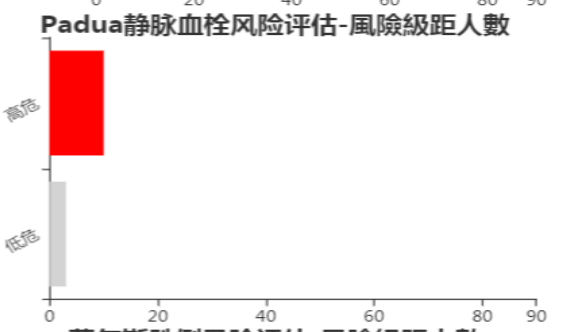
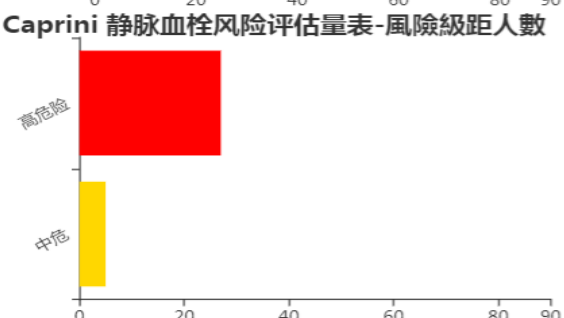
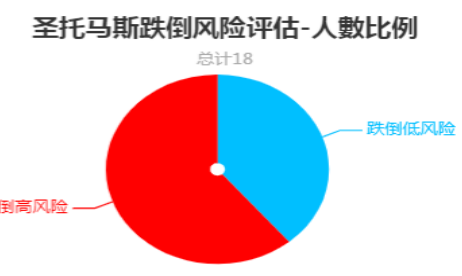
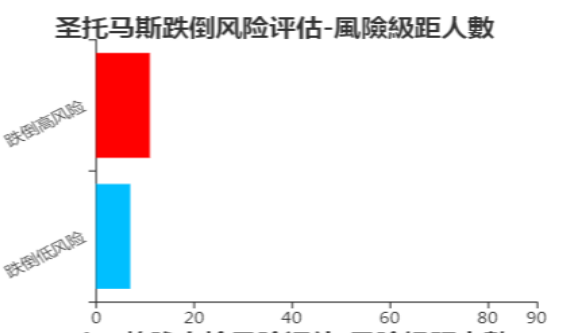
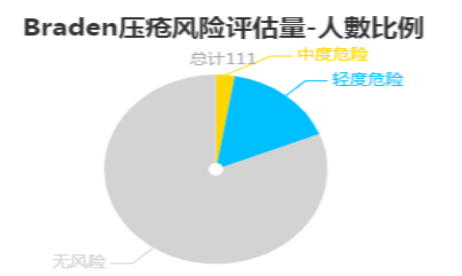
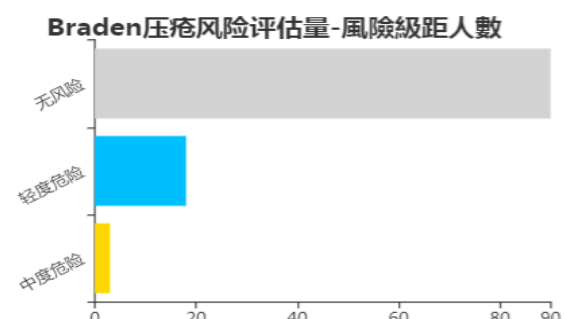
- 住院病历
- 第1次(2019.05.26)
 - 护理病历
 - 护理记录单
 - 护理记录单
 - 出入量单
 - 出入量单
 - 健康教育单
 - 健康教育单
 - 护理评估单
 - 2019-05-26 第1次评估
 - 2019-05-29 第2次评估
 - 2019-06-01 第3次评估
 - 2019-06-04 第4次评估
 - 2019-06-05 第5次评估
 - 2019-06-07 第6次评估
 - 2019-06-08 第7次评估
 - 2019-06-11 第8次评估
 - 风险评估单
 - NRS-2002营养风险筛查表
 - NRS疼痛评估表
 - 莫尔斯跌倒风险评估
 - Padua静脉血栓风险评估
 - 圣托马斯跌倒风险评估
 - Braden压疮风险评估表

河南宏力医院护理记录单								
姓名:高艳红		性别:女		年龄:38		病区:骨二护理单元		床号:30
						入院日期:2019-05-26		诊断:左侧尺骨鹰嘴骨折
								住院号:00263050
日期	时间	体温(°C)	脉搏(次/分)	呼吸(次/分)	收缩压(mmHg)	舒张压(mmHg)	护理措施	执行人
2019-05-26	08:46						进行护理评估	李建苹
2019-05-27	00:47						遵医嘱执行二级护理	李建苹
2019-05-27	02:48						遵医嘱执行二级护理	李建苹
2019-05-27	04:32						遵医嘱执行二级护理	李建苹
2019-05-27	06:00						遵医嘱执行二级护理	李建苹
2019-05-27	08:00						遵医嘱执行二级护理	郭冰滑
2019-05-27	08:15						使用数字模拟评分法以疼痛评估量表(NRS)评估患者疼痛程度分值1分。	郭冰滑
2019-05-27	09:41						使用NRS-2002营养风险筛查表进行患者营养不良风险状况评估, 分值0分、无风险。	郭冰滑
2019-05-27	09:41						评估患者疼痛持续时间, 结果为正常。	郭冰滑
2019-05-27	10:00						遵医嘱执行二级护理	郭冰滑
2019-05-27	12:04						遵医嘱执行二级护理	高秀秀
2019-05-27	14:00						遵医嘱执行二级护理	郭冰滑
2019-05-27	16:00						遵医嘱执行二级护理	郭冰滑
2019-05-27	16:00						使用数字模拟评分法以疼痛评估量表(NRS)评估患者疼痛程度分值1分。	郭冰滑
2019-05-27	18:33						遵医嘱执行二级护理	张莉华
2019-05-27	22:19						遵医嘱执行二级护理	张莉华
2019-05-28	00:00						遵医嘱执行二级护理	张锦
2019-05-28	02:01						遵医嘱执行二级护理	张锦
2019-05-28	04:00						遵医嘱执行二级护理	张锦
2019-05-28	06:00						遵医嘱执行二级护理	张锦

打印

- 按班别统计措施
- 按日期统计措施
- 措施统计通用
- 护理结果柱状叠加图
- 护理结果与预期差异折线图
- 护理结果与预期差异柱状叠加图
- 护理结果柱状比例图
- 护理问题患者比例
- 护理问题患者统计
- 护理问题类型患者比例
- 护理问题因素比例
- 护理问题子类比例
- 班次病人数统计
- 风险评估
- 全院压疮发生率
- 病区压疮发生率
- 全院压疮现患率
- ICU压疮发生率
- 病区压疮现患率
- 护患比统计
- 统计分析

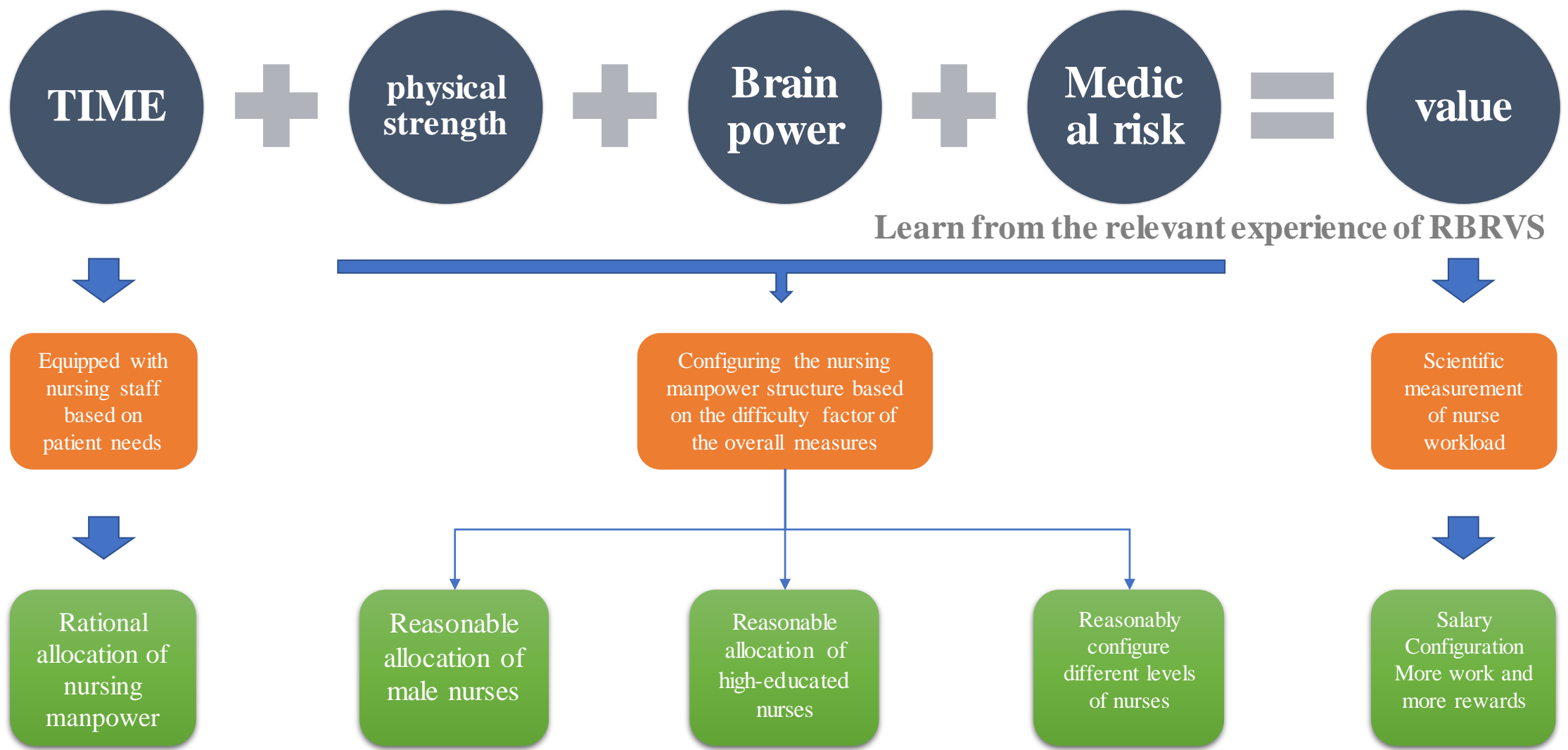
2019-06-11
2019-06-12
心血管护理单元



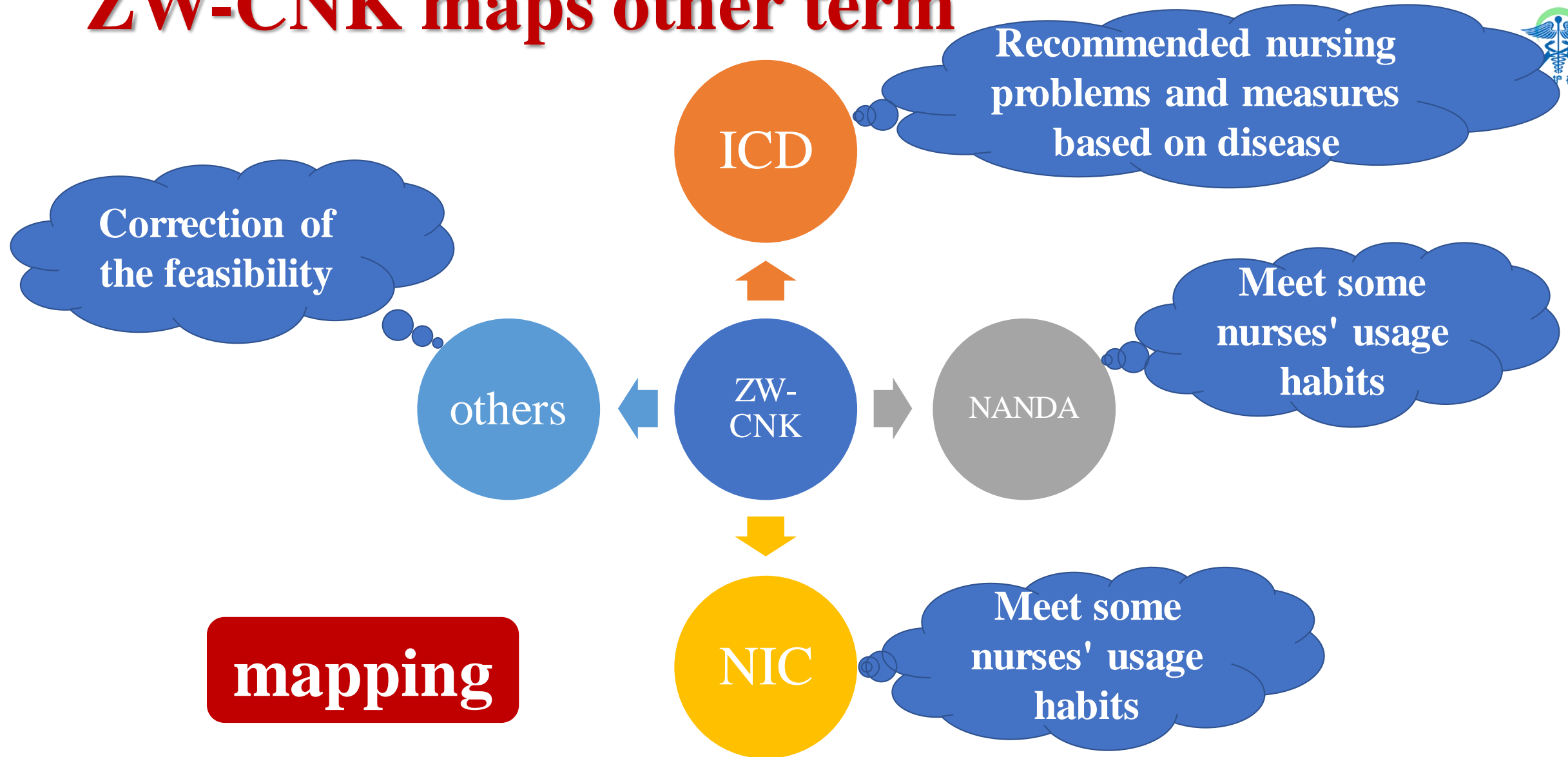
4、 The future development of CCC in China



Relative value points of Nursing measures



ZW-CNK maps other term





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