

專科護理師執行醫療業務 的病人照護品質與安全

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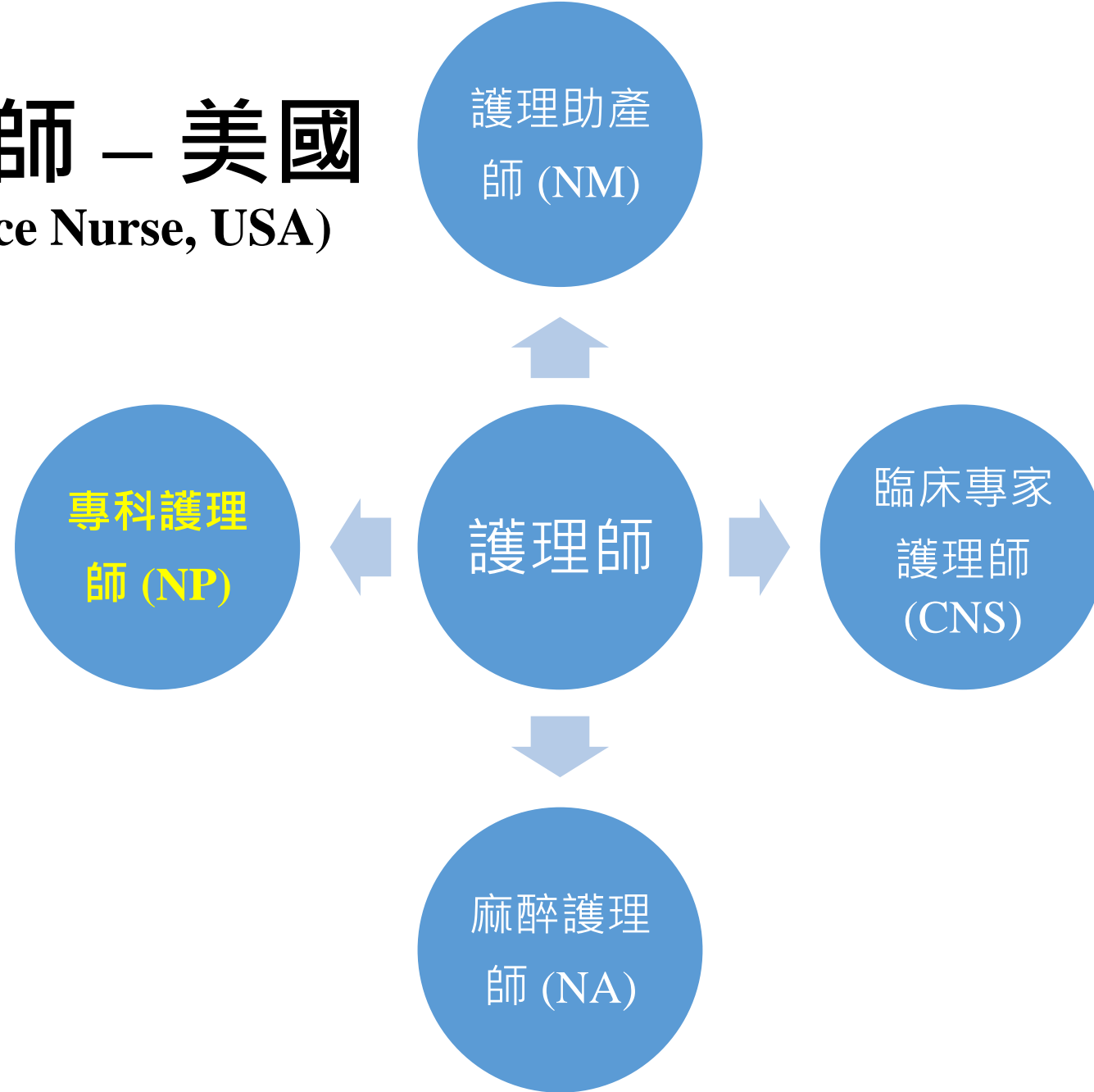
大綱

- 背景
- 品質與安全 - 單一研究
- 品質與安全 - 統合分析
- 結論

背景

進階護理師 – 美國

(Advanced Practice Nurse, USA)



醫師

親自為之

核心醫療業務

專師

醫師監督下
執行

低風險
醫療業務

護理師

醫師指示(指
導)下

醫療輔助行為

健康問題之護理評估

預防保健之護理措施

護理業務

護理指導及諮詢

醫療輔助行為

護理人員法 第二十四條 (中華民國109年1月15日)

身體評估/診察

(Physical assessment/examination)

護理身體評估
- 發現異常 -



醫師身體診察
- 診斷疾病 -



作為



診斷

處置

會診

預測

教育

臨床推理評估

學科內容知識

專科護理師的新能力與新價值 (= 預期與要求)

醫療業務執行

評估以診斷

- 資訊蒐集
- 思路邏輯
- 推理診斷

治療與處置

- 藥物治療
- 醫療處置
- 照會討論

監測與預測

- 追蹤評估
- 療效預期
- 病程預測

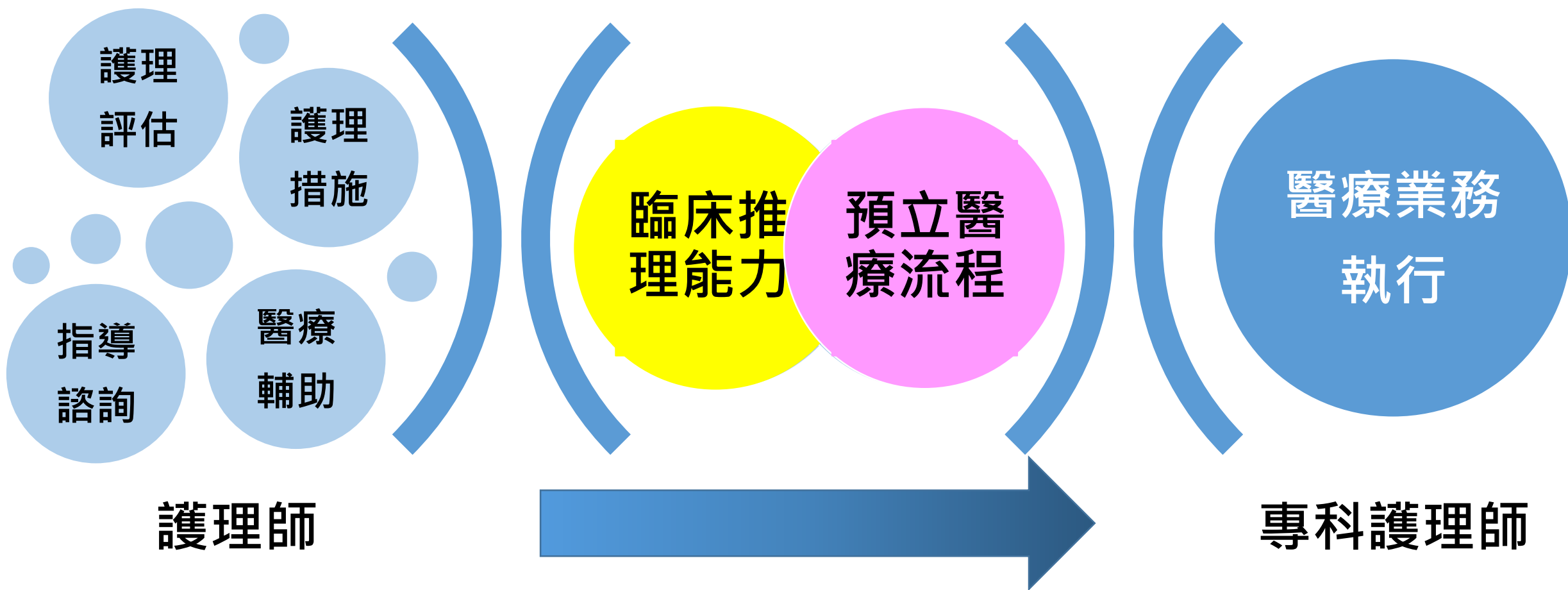
衛教與賦能

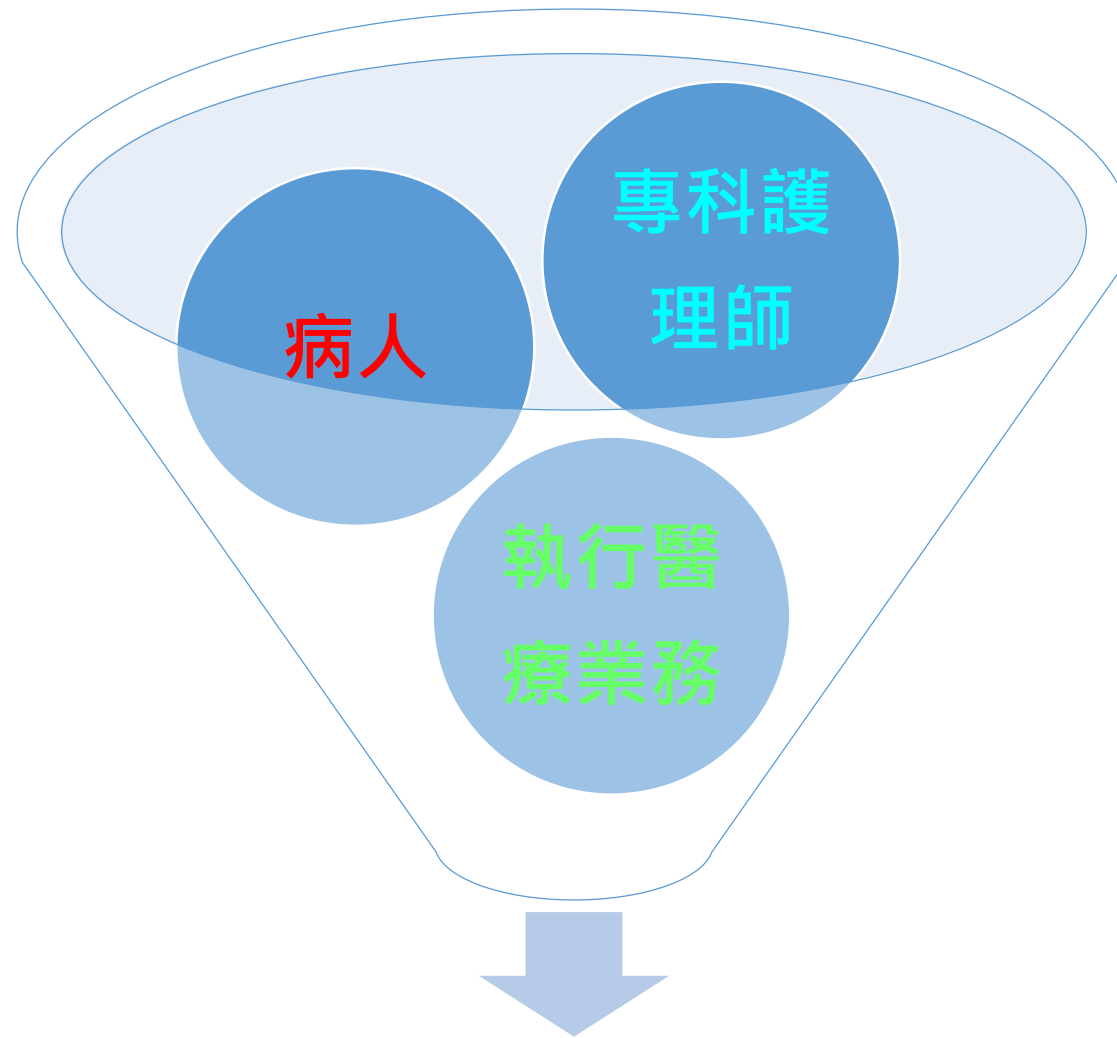
- 預防保健
- 疾病衛教
- 教育賦能

護理專業執行

專科護理師的工作場域





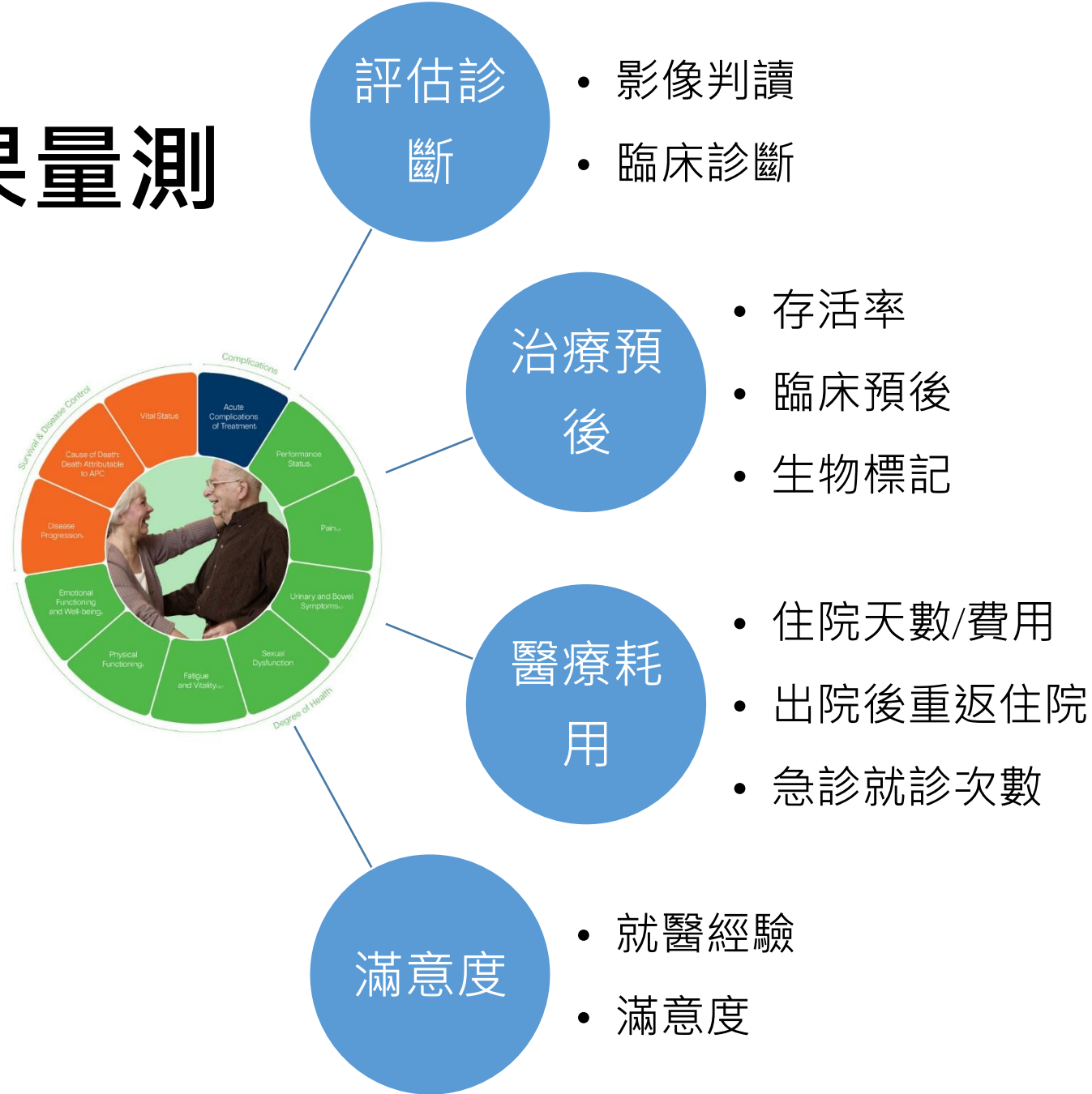


醫療品質與病人安全？



品質與安全

醫療照護成果量測



單一研究

專科護理師急診肢體骨骼影像判讀能力

- 澳洲單一醫院急診前瞻性研究，平行比較6位專科護理師 vs. 10位醫師
- 共判讀200位穩定，無合併其他部位損傷的成人傷患的肢體X光
- 以影像科醫師的判讀作為黃金標準，陽性結果 = 可能骨折+明確骨折

	敏感性	特異性	陽性預測率	陰性預測率
專科護理師	91% (87.0–95%)	85% (78.9–89.1%)	78% (72.0–83.6%)	94% (90.2–97%)
醫師	88% (83.5–92.5%)	91% (87.0–95%)	86% (81.2–90.8%)	93% (88.9–96.2%)

- 結論: 專科護理師在影像的判讀上具有高正確性，並與醫師有相當高的一致性(Weighted Kappa = 0.83)

The accuracy of adult limb radiograph interpretation by emergency nurse practitioners:
A prospective comparative study. Int J Nurs Stud. 2014 Apr;51(4):549-54.

急診專科護理師對輕症傷病患的診斷處置能力

- 2008年，荷蘭、單一社區教學醫院急診，回溯性病例對照研究
- 急診專科護理師 vs. 急診總住院醫師及資淺主治醫師
 - 平均執業年數 2.1 (專師) + 7.6 (護理師) = 9.7 年
- 在輕症(低照護需求)病人 (741位 vs. 741)的診斷處置能力上沒有差異，但所需留觀時間較短

	專科護理師	醫師	<i>P</i> – 值
遺漏診斷或不適當處置, n (%)	20 (2.7)	9 (1.2)	N.S.
遺漏診斷	12 (1.6)	5 (0.7)	
不適當處置	8 (1.1)	4 (0.5)	
平均等候看診時間, 分鐘	19 ± 20	20 ± 21	N.S.
平均急診留觀時間, 分鐘	65 ± 42	85 ± 56	< 0.001

Diagnostic accuracy of emergency nurse practitioners versus physicians related to minor illnesses and injuries. J Emerg Nurs. 2010 Jul;36(4):311-6.

專科護理師對輕症外病人的診斷處置能力 (I)

- 1997年，英國，單一醫院急診，輕症外傷病人，隨機對照研究
- 專科護理師 (4週~3年專師年資 + >4年急診護理師年資) vs. 住院醫師
- 判斷標準: 資深急診及影像科主治醫師依照研究格式對兩者的處置進行評估
- 預後比較: 評估時間、醫療處置、滿意度、症狀改善及活動力恢復情形、門診追蹤安排的當性
- **結論: 適當訓練且遵從醫療準則的專科護理師，可以提供輕症外傷病人與住院醫師(senior house officer)相同甚至更佳的照護**

Care of minor injuries by emergency nurse practitioners or junior doctors: a randomised controlled trial. Lancet. 1999;354:1321-6.

專科護理師對輕症外病人的診斷處置能力 (II)

	專師組 (n = 704)	醫師組 (n = 749)	P 值
病人評估紀錄耗時, 平均 ± 標準差 (分)	10.89 ± 4.6	9.02 ± 4.0	0.04
就診日醫療處置, n (%)			
顯著錯誤	65 (9.2)	80 (10.7)	0.20
重大醫療病史詢問遺漏	1 (0.15)	11 (1.5)	0.01
影像安排不一致性,	119 (16.9)	134 (17.9)	0.61
影響判讀不一致性	12/431 (2.8)	16/447 (3.6)	0.50
後續問卷追蹤, n (%)			
感到不滿意	15/419 (3.6)	24/487 (4.9)	0.32
症狀無預期的改善	36/409 (8.8)	48/469 (10.2)	0.41
沒有回到過去的活動力	74/424 (17.5)	76/488 (15.6)	0.45
未安排必要的門診追蹤	37/432 (8.6)	34/488 (13.1)	0.03

Care of minor injuries by emergency nurse practitioners or junior doctors: a randomised controlled trial. Lancet. 1999;354:1321-6.

專科護理師臨床推理能力研究 (I)

- 紐西蘭梅西大學，2011-2012年進行之比較性研究，
- 比較30位專科護理師 vs. 16位醫師對複雜個案情境的臨床推理能力
 - 專師: 女性27位(90%)；平均執業年數 2.2 (專師) + 28.2 (護理師) = 30.4 年
 - 醫師: 女性9位(56%)；包含心臟、胸腔、急診、老年、及一般醫學專科；平均專科執業年數 2.88 (住院醫師) + 3.42 (專科醫師) = 6.3 年
- 由專家組針對診斷、問題釐清、與計畫行動進行評估
- 量化的「放聲思考程序」(think aloud protocol)

Nurse practitioners versus doctors diagnostic reasoning in a complex case presentation to an acute tertiary hospital: A comparative study. Int J Nurs Stud. 2015 Mar;52(3):716-26.

專科護理師臨床推理能力研究 (II)

Box 2. Diagnoses, problems and actions the expert panel expected of doctors.

Expected diagnoses/problems	Expected action plan
? lower respiratory tract infection ? pleural effusion ? pulmonary embolism ? lung cancer ? chronic obstructive pulmonary disease Gastric bleeding ? Gastric ulcer	Computerised tomography or with pulmonary angiogram Sputum culture Change antibiotics to include a macrolide Lung function tests – spirometry
Hypertension	Gastroscopy Proton pump inhibitor Stop both aspirin Stop diclofenac Test Haemophilus-Pylori Refer hospital for specialist team review/? hospital admission Recheck and monitor blood pressure and if required review antihypertensive medications
Reasonably well controlled Type II diabetes mellitus Well controlled hyperlipidaemia Poor adherence to medications	Diabetic referral/Diabetic education

Nurse practitioners versus doctors diagnostic reasoning in a complex case presentation to an acute tertiary hospital: A comparative study. Int J Nurs Stud. 2015 Mar;52(3):716-26.

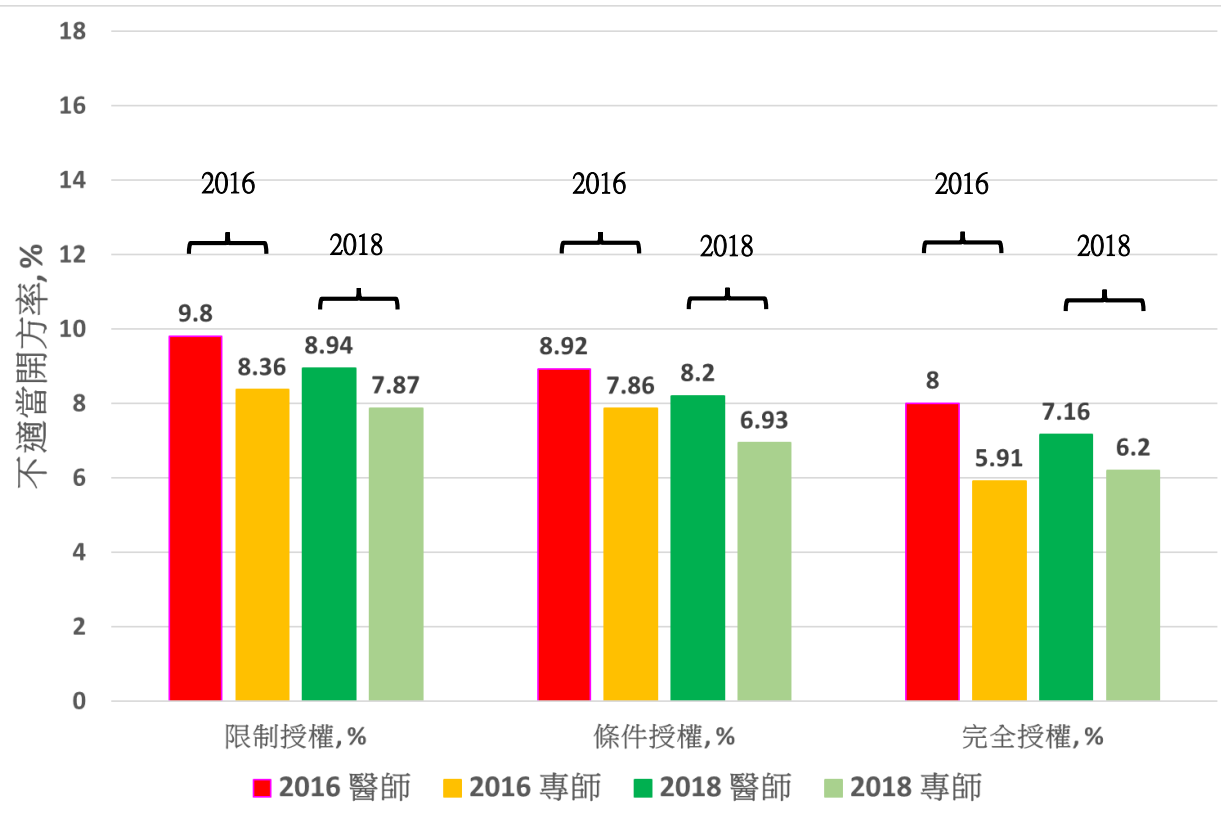
專科護理師臨床推理能力研究 (III)

- 結果與結論:
 - 對於複雜情境的個案，專科護理師在診斷、問題、行動等臨床推理能力上，有跟專科醫師相類比的能力
 - 在全球資源緊迫的地區，專科護理師可以提供進一步替代性醫療照護的協助

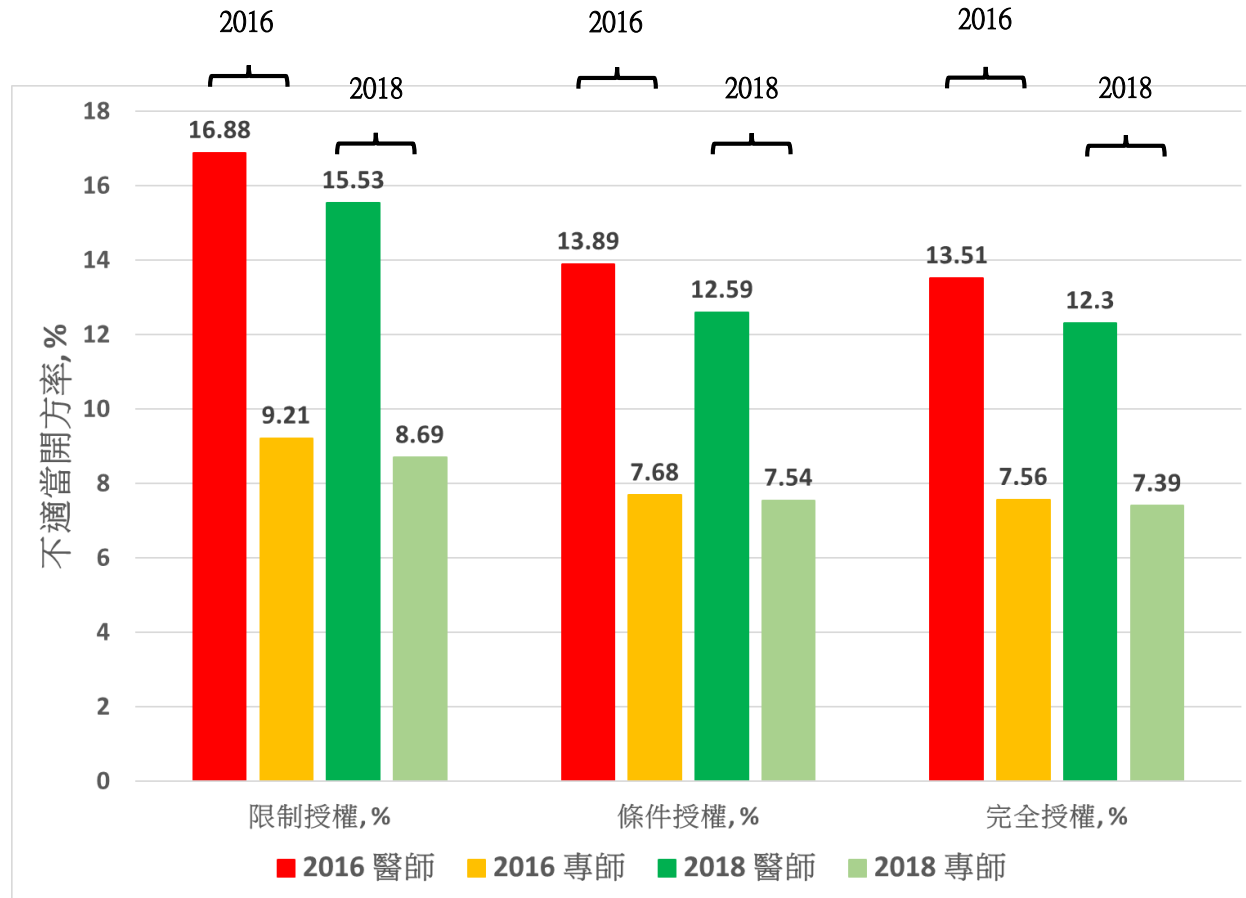
	專科護理師	專科醫師	<i>P</i> – 值
診斷 (diagnosis)	54.7%	61.9%	<i>0.17</i>
問題釐清 (identify problem)	53.3%	56.3%	<i>1.00</i>
計畫行動 (proposed action)	35.8%	34.4%	<i>0.80</i>

Nurse practitioners versus doctors diagnostic reasoning in a complex case presentation to an acute tertiary hospital: A comparative study. Int J Nurs Stud. 2015 Mar;52(3):716-26.

專科護理師藥物處方授權程度對潛在不正確藥物開方的影響 (I)



初始開方



連續開方

Impact of State Nurse Practitioner Regulations on Potentially Inappropriate Medication Prescribing Between Physicians and Nurse Practitioners: A National Study in the United States. J Nurs Care Qual. 2022;37:6-13.

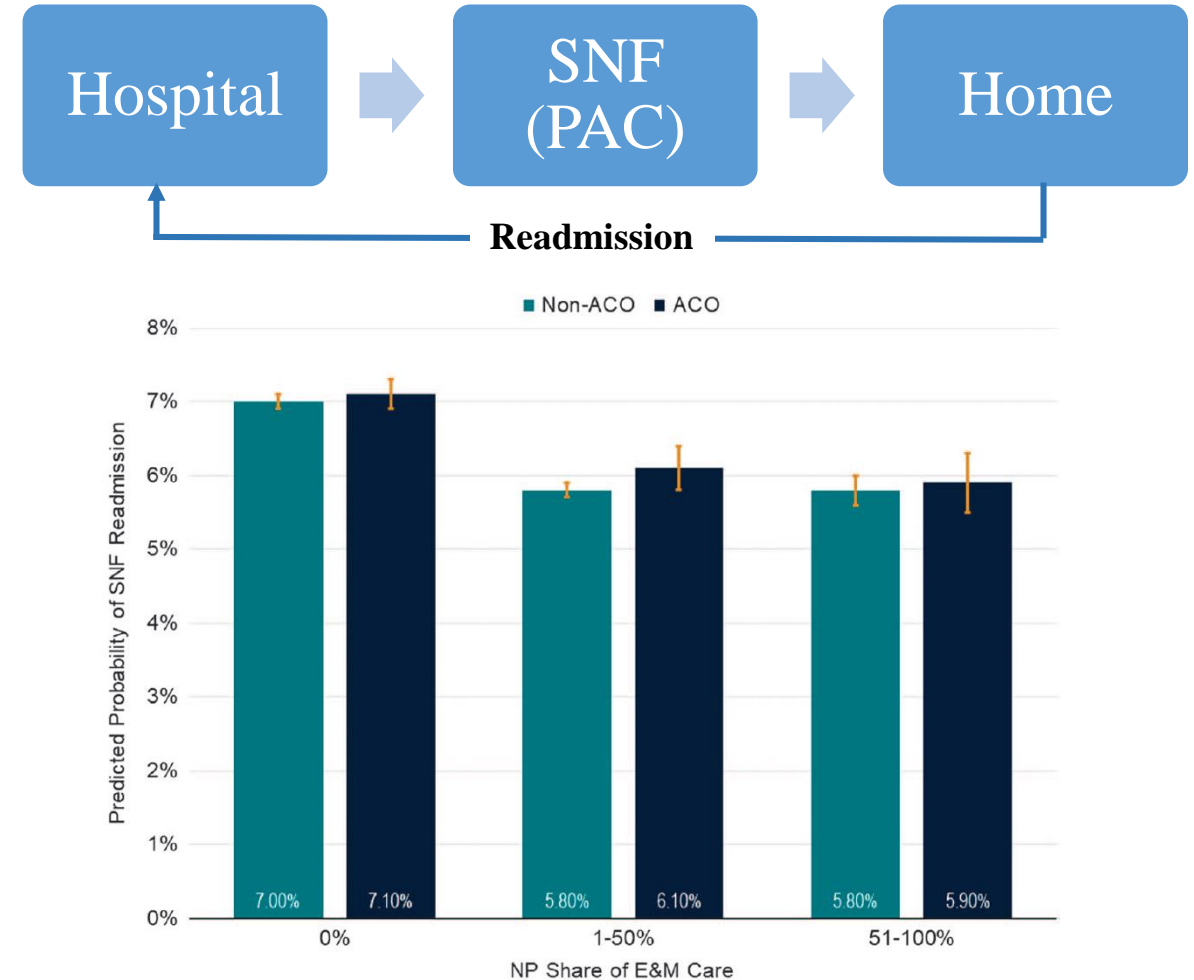
專科護理師藥物處方授權程度對潛在不正確藥物開方的影響 (II)

- 潛在不正確藥物開方率在2018年比在2016年多呈現下降的情形
- 專科護理師的潛在不正確藥物開方率在不同州均比醫師為低
- 給予專師完全開方授權的州，比立法限制授權及條件授權的州有更低的潛在不正確藥物開方率

Impact of State Nurse Practitioner Regulations on Potentially Inappropriate Medication Prescribing Between Physicians and Nurse Practitioners: A National Study in the United States. J Nurs Care Qual. 2022;37:6-13.

專科護理師減少急性後期照護病人的再住院率

- 負責任護理組織(ACO)在急性後期照護(PAC)期間，提供較多的專科護理師評估與處置
- 有專科護理師參與病人的急性後期照護，可以減少病人的再次住院率 (5.9% vs. 7.1%; $P < 0.001$)



The Impact of Nurse Practitioner Care and Accountable Care Organization Assignment on Skilled Nursing Services and Hospital Readmissions. Med Care. 2023 Mar 15. Online ahead of print.

專科護理師與醫師執行初級照護的預後比較 (I)

- 研究設計

- 1995 Aug. ~ 1997 Oct., 隨機研究 (Randomized trial)
- 1316位急診或急性照護中心就診病人
- 出院後隨機分配至專科護理師($n = 806$)或醫師($n = 510$)的門診追蹤至滿一年
- 預後比較: 滿意度(問卷)、健康狀態(SF-36)、生理功能檢測(尖峰呼氣流量、糖化血紅素、血壓)、醫療資源耗用(門診次數、急診就診次數、有無住院)

Primary care outcomes in patients treated by nurse practitioners or physicians: a randomized trial. JAMA 2000;283:59-68.

專科護理師與醫師執行初級照護的預後比較 (II)

- 研究結果: 滿意度

Table 2. Patient Satisfaction: Initial Visit and 6-Month Follow-up Interviews

	Initial Visit				6-Month Follow-up			
	Nurse Practitioner Group (n = 726)	Physician Group (n = 453)	Comparison	P Value	Nurse Practitioner Group (n = 644)	Physician Group (n = 389)	Comparison	P Value
Provider attributes mean score*	4.16	4.19	$t = 0.815$	.42	4.12	4.22	$t = 1.963$	.05
Overall satisfaction mean score*	4.59	4.60	$t = 0.144$	.89	4.45	4.46	$t = 0.161$	.87
Problems, % of patients reporting†								
0	74.4	70.2	$\chi^2 = 2.605$	.46	59.1	62.7	$\chi^2 = 2.146$	.54
1	15.4	18.7			25.1	23.5		
2	6.5	7.2			10.2	7.8		
3-5	3.7	3.9			5.6	5.9		
% of patients who would recommend clinic to others	98.7	98.2	$\chi^2 = 0.544$	.46	95.0	95.1	$\chi^2 = 0.000$	.99

*Calculated from items rated on a 5-point scale, in which 5 is the most positive response.

†Percentages may not add to 100% due to rounding.

Primary care outcomes in patients treated by nurse practitioners or physicians: a randomized trial. JAMA 2000;283:59-68.

專科護理師與醫師執行初級照護的預後比較 (III)

- 研究結果: 健康狀態

在身體功能、活動力、社交功能、角色狀態、以及心智健康等方面，在校正病人的基本健康狀態後，兩者並無差別

Table 3. Health Status Based on MOS SF-36 Results*

	6-Month Scores for Nurse Practitioner Group (n = 649) and Physician Group (n = 391)								
	Comparison of Baseline and 6-Month Scores for Entire Sample (n = 1040)			Unadjusted Mean Scores			Adjusted Mean Scores†		
				Nurse Practitioner Group	Physician Group	Comparison	Nurse Practitioner Group	Physician Group	Comparison§
	Baseline	6 mo	Change (Paired t tests)‡						
Physical functioning	60.30	64.26	t = 4.631	64.94	62.90	t = -1.126 P = .26	64.21	63.78	t = 0.394 P = .77
Role-physical	36.06	53.31	t = 10.519	53.74	52.62	t = -0.375 P = .71	52.92	53.38	t = -0.192 P = .85
Bodily pain	42.74	53.01	t = 9.133	53.66	52.07	t = -0.748 P = .45	52.91	52.73	t = 0.092 P = .93
General health	42.94	48.75	t = 7.662	48.79	48.67	t = -0.070 P = .95	48.42	49.04	t = -0.454 P = .65
Vitality	47.02	53.45	t = -7.771	53.86	52.79	t = -0.635 P = .53	53.27	53.38	t = -0.072 P = .94
Social functioning	58.51	70.47	t = 12.507	70.39	70.59	t = 0.114 P = .91	70.25	70.70	t = -0.279 P = .78
Role-emotional	44.70	56.26	t = 7.105	56.71	55.24	t = -0.488 P = .63	55.81	56.34	t = -0.192 P = .85
Mental health	53.51	60.17	t = 8.177	60.75	59.45	t = -0.742 P = .46	60.37	59.63	t = 0.491 P = .62
Physical component summary	37.46	40.63	t = 8.706	40.83	40.29	t = -0.728 P = .47	40.53	40.60	t = -0.102 P = .92
Mental component summary	40.56	44.58	t = 9.438	44.64	44.29	t = -0.398 P = .69	44.55	44.48	t = 0.103 P = .92

*MOS SF-36 indicates Medical Outcomes Study Short-Form 36.

†Adjusted for age, sex, baseline MOS subscale scores, and each selected chronic condition.

‡P values for change are all <.001.

§Adjusted t test is based on a regression model, with age, sex, baseline MOS subscale scores, and each condition entered as covariates.

Primary care outcomes in patients treated by nurse practitioners or physicians: a randomized trial. JAMA 2000;283:59-68.

專科護理師與醫師執行初級照護的預後比較 (IV)

- 研究結果: 生理功能檢測

	專科護理師組	醫師組	<i>p</i> 值
尖峰呼氣流量 (氣喘病人數)	297 L/min (107人)	292 L/min (64人)	0.77
糖化血紅素 (糖尿病人數)	9.5 % (58人)	9.4 % (46人)	0.82
收血壓 (高血壓病人數)	137 mmHg (211人)	139 mmHg (145人)	0.28

Primary care outcomes in patients treated by nurse practitioners or physicians: a randomized trial. JAMA 2000;283:59-68.

專科護理師與醫師執行初級照護的預後比較 (V)

- 研究結果: 醫療資源耗用

Table 4. Health Services Utilization*

	Change for Entire Sample, %			6 Months After Initial Primary Care Visit, %			1 Year After Initial Primary Care Visit, %		
	6 mo Prior (N = 1309)	6 mo After (N = 1309)	Change, z Score†	Nurse Practitioner Group (n = 800)	Physician Group (n = 509)	Comparison	Nurse Practitioner Group (n = 800)	Physician Group (n = 509)	Comparison
Primary care visits									
0	88.8	21.2	-26.809	20.6	22.2	$\chi^2 = 0.059$ <u>$P = .81$</u>	18.0	19.1	$\chi^2 = 1.033$ <u>$P = .31$</u>
1	5.7	22.4		22.6	22.0		18.4	16.1	
2	2.9	17.3		18.0	16.3		13.8	13.4	
3	2.6	13.8		14.5	12.8		10.3	8.8	
4	0	9.8		9.6	10.0		9.3	8.8	
5	0	6.1		5.3	7.5		7.5	6.1	
≥6	0	9.3		9.4	9.2		22.9	27.7	
Specialty visits									
0	89.1	62.3	-15.578	61.8	63.1	$\chi^2 = 0.678$ <u>$P = .41$</u>	54.5	54.8	$\chi^2 = 0.265$ <u>$P = .61$</u>
1	5.6	14.2		13.3	15.7		13.9	16.5	
2	2.3	9.3		10.8	7.1		8.9	6.3	
≥3	3.1	14.2		14.3	14.1		22.8	22.4	
ED and urgent care									
0	58.1	76.5	-12.937	77.4	75.0	$\chi^2 = 0.428$ <u>$P = .51$</u>	65.8	66.2	$\chi^2 = 0.286$ <u>$P = .59$</u>
1	16.4	16.2		15.3	17.7		20.4	17.7	
2	16.4	4.0		4.3	3.7		7.4	8.6	
≥3	9.1	3.3		3.1	3.5		6.5	7.5	
Hospitalizations									
0	94.5	95.3	-0.884 $P = .38$	95.9	94.3	$\chi^2 = 1.703$ <u>$P = .19$</u>	91.5	90.2	$\chi^2 = 0.664$ <u>$P = .42$</u>
≥1	5.5	4.7		4.1	5.7		8.5	9.8	

*Percentages may not add to 100% due to rounding. ED indicates emergency department.

†Except for hospitalizations, $P < .001$ for column.

在一般門診、專科門診、急診照護、以及住院次數等醫療資源的耗用，兩者同樣也沒有差別

Primary care outcomes in patients treated by nurse practitioners or physicians: a randomized trial. JAMA 2000;283:59-68.

專科護理師與醫師執行初級照護的預後比較 (VI)

- 研究結論

- 在專科護理師在具有與醫師同樣的權威、責任、創造力、與行政要求下，兩者在病人醫療照護的預後上，有一樣的表現

Primary care outcomes in patients treated by nurse practitioners or physicians: a randomized trial. JAMA 2000;283:59-68.

統合分析

專科護理師替代醫師執行初級照護 (I)

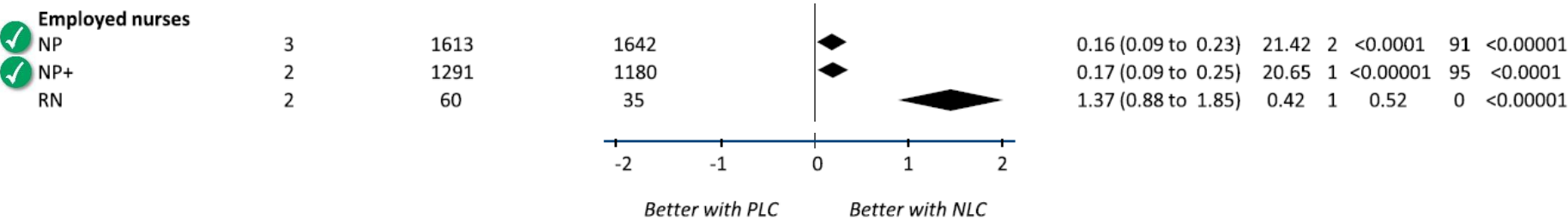
- 研究目標 – 評估護理師取代醫師執行初級照護在病人預後、照護過程、及資源利用的影響
- 方法:
 - 2位專家分別獨立進行文獻回顧
 - 隨機對照試驗 (Randomized controlled trial)
 - 資料庫: OVID Medline, Embase, CINAHL and The Cochrane Library of Systematic Reviews (~ August 2012)
- 醫療替代範疇
 - 滿意度、住院率、死亡率、生活品質、醫療支出
- 最後採用24篇隨機對照試驗，及2篇醫療經濟學研究

Substitution of physicians by nurses in primary care: a systematic review and meta-analysis. BMC Health Serv Res. 2014 May 12;14:214.

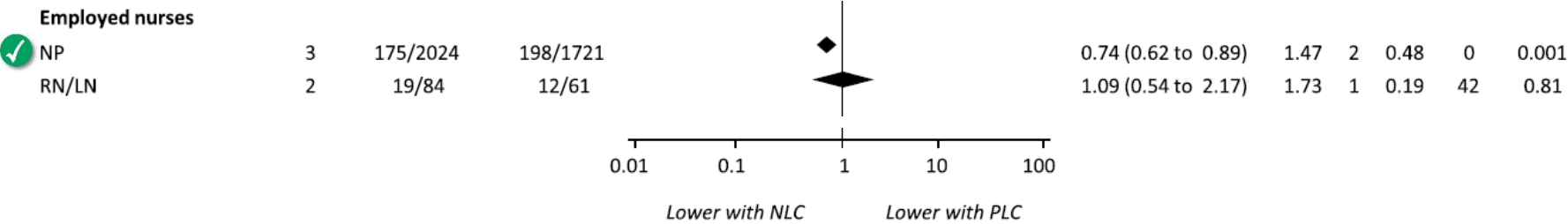
專科護理師替代醫師執行初級照護 (II)

• 將對於醫師，接受專科護理師初級照護的病人有:

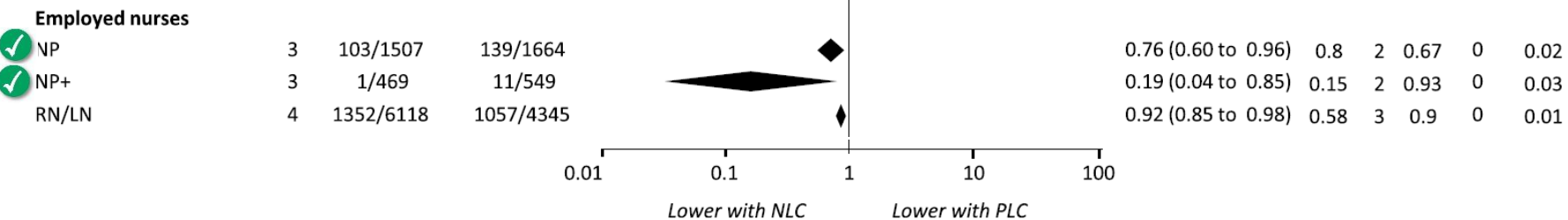
• 較高滿意度



• 較低住院率



• 較低死亡率



Substitution of physicians by nurses in primary care: a systematic review and meta-analysis. BMC Health Serv Res. 2014 May 12;14:214.

護理師替代醫師執行初級照護 (I)

- 研究目標 – 評估護理師取代醫師執行初級照護在病人預後、照護過程、及資源利用的影響
- 方法:
 - 2位專家分別獨立進行文獻回顧
 - 隨機對照試驗 (Randomized trial)
 - 資料庫: CENTRAL, MEDLINE, Ovid, CINAHL, EbscoHost, ICTRP, & ClinicalTrials.gov trial registries
- 醫療替代範疇
 - 第一接觸照護(包括緊急照護)、病人症狀的進一步評估、慢性疾病的持續追蹤、疾病預防服務、醫療健康教育
 - 多數護理師可以獲得醫師的建議或支持

Nurses as substitutes for doctors in primary care. Cochrane Database Syst Rev. 2018 Jul 16;7(7):CD001271.

護理師替代醫師執行初級照護 (II)

- 最後整合18篇隨機對照試驗
- 發現: 相對於醫師照護，護理師照護的病人在:
 - 病人預後: 較少的死亡；較好的血脂肪與**血壓控制**；較高的**滿意度**；較佳的身體功能與**生活品質**
 - 照護過程: **較長的照會討論時間**；較不足的疼痛、血糖、與疾病活性控制
 - 資源利用: 相近但稍少的檢查安排、藥物處方、醫院轉診及緊急醫療需求；相近但稍多的後續住院；較多的約定返診(attended return visit)及**依時返診**(attended return visit)

Nurses as substitutes for doctors in primary care. Cochrane Database Syst Rev. 2018 Jul 16;7(7):CD001271.

護理師替代醫師執行初級照護 (III)

- 判讀

- 整體而言，有較佳的病人預後與滿意度
- 提供病人較長的看診諮詢時間，並有較好的醫療順從性
- 在用藥方面，特別在糖尿病與疼痛控制的用藥較為保守
- 耗用較少的醫療資源，但須注意後續轉診時間點的拿捏

- 結論

- 經由訓練的護理師(如專科護理師)，對於發生中或緊急的身體症狀及慢性健康狀態的照護，可以提供與醫師相同或更佳的照護品質與結果

Nurses as substitutes for doctors in primary care. Cochrane Database Syst Rev. 2018 Jul 16;7(7):CD001271.

進階護理師對於長照照護的效果

- 研究目標 – 評估進階護理師(CNS &/or NP)對於長照老年族群的醫療照護效果
- 方法:
 - 評估接受進階護理師照護的長照中心60 歲以上長者，相對於對照組的照護效果
 - 隨機對照試驗、準隨機對照研究、前瞻性世代準實驗研究
 - 1966~2010年間，搜尋12個醫療資料庫
- 最後有4個研究符合收案排除條件
- 發現：有進階護理師參與照護的長照中心，其住民發生憂鬱、尿失禁、壓力性損傷、需要接受約束、及出現攻擊性行為的比率均比對照組(常規照護人力)為低

A systematic review of the effectiveness of advanced practice nurses in long-term care. Donald F, et al. J Adv Nurs. 2013;69:2148-61.

結論與心得

結論

- 經由良好訓練的專科護理師，在影像判讀、鑑別診斷、處置決策、處方開立等，均有跟醫師相近甚至更好的表現
- 專科護理師的照護能力，在緊急醫療處置、急性後期照護、及社區長期照護，都有良好的表現
- 對於病人而言，無論在滿意度、醫療順從性、身體功能恢復、與整體生活品質，接受專科護理師的照護均高於接受醫師的照護

心得

- 為病人提升品質與安全，為醫院提供效率與永續，為自己建立成就與價值
- 專科護理師的貢獻，應該有適當且設計良好的回饋激勵機制
- 專科護理師的價值，建立在能力提升、制度法規、資源支持之上
 - 能力提升: 臨床推理能力、專師教育規劃
 - 制度法規: 預立醫療流程、相關法規修訂
 - 資源支持: 友善執業環境、外部評鑑認證

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交流與討論

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