認識藥事照護

臺大醫院藥劑部
吳建志組長

定義

- 藥師提供照護，讓病人的藥品使用最適化，並改善健康相關成效
  - **Pharmaceutical care is the pharmacist's contribution to the care of individuals in order to optimize medicines use and improve health outcomes.**

Int J Clin Pharm 2014;36:544–555

藥事照護定義by 美國臨床藥學會 (ASHP)

有責任的提供藥物治療以得到具體的成效，改善病人生活品質，這些具體成效包括

(1) 治癒一種疾病，
(2) 消除或減緩一個病人的症狀，
(3) 阻止或減緩一種疾病的進程，
(4) 預防一種疾病或症狀。

" Pharmaceutical Care is defined as the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life. These outcomes are:

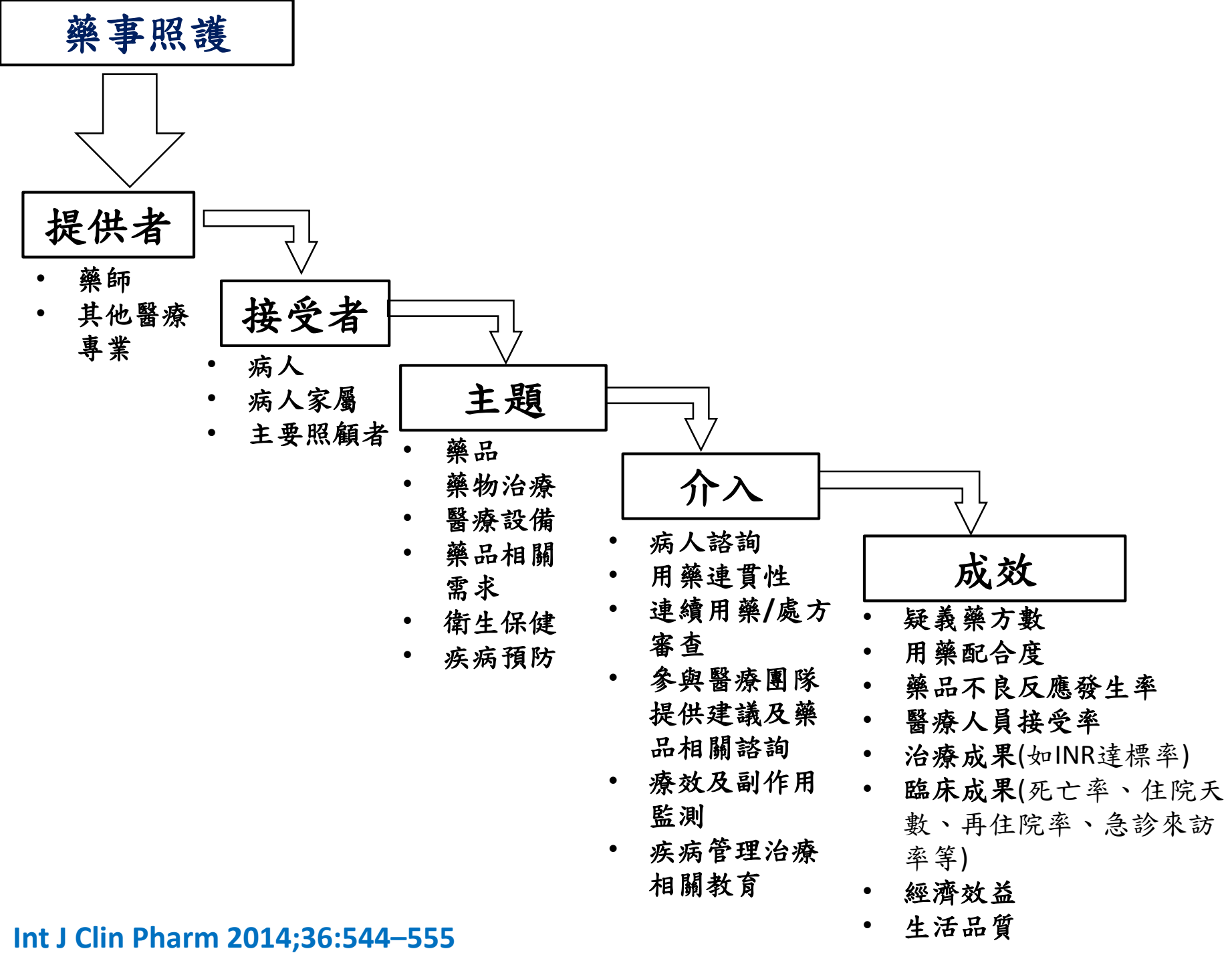
(1) cure of a disease,
(2) elimination or reduction of a patient's symptomatology,
(3) arrest or slowing of a disease process, or
(4) prevention of a disease or symptomatology."

藥事照護的主要元素與基礎

- 主要元素
  - 藥品相關
    - 辨識潛在與實際發生的藥品相關問題
    - 解決實際發生的藥品相關問題
    - 預防潛在的藥品相關問題
  - 照護
  - 成效
  - 生活品質
- 基礎
  - 信守與病人及醫師承擔相同責任的信念與承諾，讓藥物治療得到最佳的成效
  - 奠定專業與病人的信賴關係
  - 有計畫、介入處置與成效之正式紀錄

藥事服務vs.藥事照護

- **藥事服務**
  - 藥品選擇與採購
  - 藥品儲存
  - 處方審查
  - 藥品調劑與製備
  - 用藥指導
- **藥事照護**
  - 病人諮詢
  - 用藥連貫性
  - 連續用藥/處方審查
  - 參與醫療團隊提供建議及藥品相關諮詢
  - 療效及副作用監測
  - 疾病管理治療相關教育



Int J Clin Pharm 2014;36:544–555

重症病人特色

- 病情不穩定、需有連續性的監測
  - 易發生器官衰竭
- 用藥品項較多
- 常無法自行服藥，較常使用針劑或藥品需磨粉

藥品使用原則

- 簡單、有效
  - 越少越好
  - 有適應症才使用
- 藥效快、作用時間短
- 需每日檢視藥品使用
- 預防性藥品
- 符合經濟效益

藥事照護

- 參與病房迴診
- 病人轉入、轉出進行藥歷整合
- 評估病患藥物治療
  劑量、劑型、給藥途徑、給藥速率、使用期限、適應症、藥品交互作用、給藥相容性等
- 追蹤病患臨床狀況及治療療效
  監測藥品療效及不良反應、加回門診長期用藥等
- 藥品不良反應評估及通報
- 療劑監測
- 協助全靜脈營養開方
- 提供醫療團隊藥物相關資訊
- 病歷紀錄

Do we need a pharmacist in ICU ?

Critical care delivery in the intensive care unit: Defining clinical roles and the best practice model

Richard J. Brilli, MD, FCCM; Antoinette Spevetz, MD, FCCM; Richard D. Branson, RRT, FCCM; Gladys M. Campbell, RN, MSN, FCCM; Henry Cohen, PharmD, MS; Joseph F. Dasta, MSc, FCCM; Maureen A. Harvey, RN, MPH, FCCM; Mark A. Kelley, MD; Kathleen M. Kelly, MD, FCCM; Maria I. Rudis, PharmD, FCCM; Arthur C. St. Andre, MD, FCCM; James R. Stone, MD, FCCM; Daniel Teres, MD, FCCM; Barry J. Weled, MD, FCCM; the members of the American College of Critical Care Medicine Task Force on Models of Critical Care Delivery*; the members of the American College of Critical Care Medicine Guidelines for the Definition of an Intensivist and the Practice of Critical Care Medicine‡

The presence of a pharmacist as an integral part of the ICU team, including but not limited to making daily ICU rounds, improves the quality of care in the ICU and reduces errors. The integration of a dedicated pharmacist into the ICU team is recommended. (**grade C recommendation**).

Crit care Med 2001;29(10):2007-2019

Pharmacist Participation on Physician Rounds and Adverse Drug Events in the Intensive Care Unit

Table 2. Adverse Drug Event Rates*

	Study Unit		Control Unit	
	Phase 1	Phase 2	Phase 1	Phase 2
Average daily census	13.9	12.4	12.9	11.9
Total patient-days No.	787	861	461	644
No. of patients	75	75	50	75
All adverse drug events, No.	35	10	16	30
Rate per 1000 patient-days†	33.0 (27-39)	11.6 (8-15)‡	34.7 (26-43)	46.6 (38-55)
Preventable ordering adverse drug events, No.	11	3	5	8
Rate per 1000 patient-days†	10.4 (7-14)	3.5 (1-5)‡	10.9 (6-16)	12.4 (8-17)

*Phase 1 (preintervention) February 1, 1993-July 31, 1993; phase 2 (postintervention) October 1, 1994-July 7, 1995.
†Data expressed as percentage (95% confidence interval).
‡$P<.001$ for comparison with both phase 1 in the study unit and phase 2 in the control unit.

JAMA 1999;282:267-270

Clinical and economic outcomes of involving pharmacists in the direct care of critically ill patients with infections*

Robert MacLaren, PharmD, FCCM, FCCP; C. A. Bond, PharmD, FASHP, FCCP;
Steven J. Martin, PharmD, BCPS, FCCM, FCCP; David Fike, PhD

	With pharmacist	Without pharmacist	P value
Patients	13804 (55.17)	11219 (44.83)	
Mortality (%)	2016 (14.61)	2025 (18.05)	< 0.001
ICU stay, days	16.13 ± 15.62	17.40 ± 19.70	< 0.001
Insurance charge, USD/case	98422 ± 124460	110275 ± 159078	< 0.001
Drug charge	21541 ± 41013	22615 ± 37881	< 0.001
Lab charge	12194 ± 16430	12885 ± 17793	< 0.001

Crit care Med 2006;36(12):3184-3189

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Crit care Med 2006;36(12):3184-3189

藥事介入成效

- **臨床成果**
  - 減少用藥疏失、可能發生的不良反應(ADR)、住院天數等
- **節省花費**
  - **直接的藥費節省**
    - 例如用藥劑量/頻次問題、用藥期間/數量問題、用藥途徑或劑型問題、適應症問題及藥品併用問題等，可以保守計算一天節省相關藥品花費。
  - **間接的醫療費用節省**
    - 減少ADR導致的住院所衍生的花費

Intensive Care Med 2003;29:691–698

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The cost-saving effect and prevention of medication errors by clinical pharmacist intervention in a nephrology unit

Chia-Chi Chen, MSCP[a], Fei-Yuan Hsiao, PhD[a,b,c], Li-Jiuan Shen, PhD[a,b,c], Chien-Chih Wu, MSCP[a,c,*]

Abstract

Medication errors may lead to adverse drug events (ADEs), which endangers patient safety and increases healthcare-related costs. The on-ward deployment of clinical pharmacists has been shown to reduce preventable ADEs, and save costs. The purpose of this study was to evaluate the ADEs prevention and cost-saving effects by clinical pharmacist deployment in a nephrology ward.

This was a retrospective study, which compared the number of pharmacist interventions 1 year before and after a clinical pharmacist was deployed in a nephrology ward. The clinical pharmacist attended ward rounds, reviewed and revised all medication orders, and gave active recommendations of medication use. For intervention analysis, the numbers and types of the pharmacist's interventions in medication orders and the active recommendations were compared. For cost analysis, both estimated cost saving and avoidance were calculated and compared.

The total numbers of pharmacist interventions in medication orders were 824 in 2012 (preintervention), and 1977 in 2013 (postintervention). The numbers of active recommendation were 40 in 2012, and 253 in 2013. The estimated cost savings in 2012 and 2013 were NT$52,072 and NT$144,138, respectively. The estimated cost avoidances of preventable ADEs in 2012 and 2013 were NT$3,383,700 and NT$7,342,200, respectively. The benefit/cost ratio increased from 4.29 to 9.36, and average admission days decreased by 2 days after the on-ward deployment of a clinical pharmacist.

The number of pharmacist's interventions increased dramatically after her on-ward deployment. This service could reduce medication errors, preventable ADEs, and costs of both medications and potential ADEs.

Abbreviations: ADE = adverse drug events, NHI = National Health Insurance, NTUH = National Taiwan University Hospital.

Keywords: clinical pharmacist, cost saving, medication error, nephrology, preventable adverse drug event

藥事介入成效-間接醫療費用節省

- 每個ADR可延長住院天數2天
- 加護病房病房費約7000元/天
- 根據不同藥事介入，若未介入發生ADR的機率(P)為0/0.01/0.1/0.4/0.6
  - 四大類23小項
- 預防ADR的件數 = P*N (介入件數)
- 醫療費用節省 = 2*7000*P*N

Medicine 2017;96(34):e7883

藥事介入種類-建議處方

- 用藥劑量/頻次問題
- 用藥期間/數量問題(包含停藥)
- 用藥途徑或劑型問題
- 建議更適當用藥/配方組成
- 給藥問題(速率、輸注方式、濃度或稀釋液)
- 適應症問題
- 用藥禁忌問題(包括過敏史)
- 藥品併用問題
- 藥品交互作用
- 疑似藥品不良反應
- 藥品相容性問題
- 不符健保給付規定
- 其他

藥事介入種類-主動建議

- 用藥劑量/頻次問題
- 用藥期間/數量問題(包含停藥)
- 用藥途徑或劑型問題
- 建議更適當用藥/配方組成
- 藥品不良反應評估
- 建議用藥/建議增加用藥
- 建議藥物治療療程
- 建議靜脈營養配方

藥事介入種類-建議監測

- 藥品療效
- 藥品不良反應
- 藥品血中濃度

藥事介入種類-用藥連貫性

- 藥歷審核與整合
- 藥品辨識/自備藥辨識
- 病人用藥遵從性問題

病歷紀錄-SOAP格式

- Problem
- Subjective (S)
  - 病人、家人或其他醫療人員告知的訊息
- Objective (O)
  - 客觀可測量的資訊
- Assessment (A)
  - 根據問題及主客觀資訊，評估目前的治療處置
- Plan (P)
  - 治療建議
  - 監測建議
  - 衛教建議

Pharmacy Note

2018/04/25 11:21

Sbjective:

Dyspnea

Objective:

The 53-year-old male
Admitted to ICU due to septic shock with respiratoy failure
Underlying disease:
  1. Rectal cancer, cT3N1M0, stage IIIB, KRAS exon 2 wild type, lastest regimen: nivolumab (IV) on 2018/04/03
  2. Hypertension
CRRT for lactic acidosis
CRRT setting: CVVH
Blood flow: 150 mL/min
Ultrafiltration rate: 39 mL/kg/hr, 2.8 L/hr
AK material and surface area: Gambro HF-1400 (polyarylethersulphone hollow fiber, 1.4 m2)
Pre/Post dilution: 30 %/ 70 %
Antibiotic regimen:
doripenem 250 mg Q8H IF
Culture result: 4/23 B/C(peri*2,port-A*2): WT E.coli*4

Dose adjustment in CRRT

Assessment:

Current dose suggestion based on ultrafiltration rate: 1-2 L/hr, current ultrafiltration rate: 2.8L/hr, doripenem dose should be adjusted

Plan:

1. Adjust doripenem dose to 500 mg q8h IF
2. Adjust antibiotic dose if CRRT shift to SLED or HD

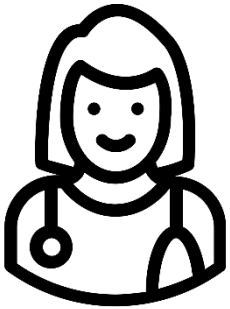
記錄者

吳建志藥師

申報注意事項

- 同日多筆介入只能申報一筆
- 一筆介入可申報連續三日照護費用
- 申報總日數不得超過加護病房總住院天數
  - 加護病房總住院天數: 算進不算出

- 病人自11/1入住加護病房，11/10離開加護病房，藥師於11/2 上午及下午各介入一次，11/3上午介入一次，11/10介入一次，請問可以申報幾日藥事照護費用?
  - 總加護病房住院天數 = 9天 (11/1-11/9)
  - 11/2介入，可申報11/2, 3, 4
  - 11/3介入，可申報11/3, 4, 5
  - 11/10介入，無法申報(算進不算出)
  - 共可申報11/2, 3, 4, 5



用藥安全

增加藥品療效

減少用藥疏失、藥品不良反應及相關醫療支出