



## An integrated pharmaceutical care framework

Bart JF van den Bemt, PharmD, PhD

Specialist knowledge and a close relationship with medical specialists combine to put hospital pharmacists in a good position to provide high quality pharmaceutical services in secondary care. This care will not be restricted to the hospital, it will increasingly be provided in outpatient wards and at home as well. Specialist integrated pharmaceutical care will therefore be delivered in the hospital, in outpatients and sometimes even in the patient's home.

### A practical framework including all essential care

The Pharmaceutical Patient Care Committees of the Dutch Association of Hospital Pharmacists (NVZA) and the Netherlands Association of Outpatient Pharmacy (NVPF) have identified each component of hospital pharmaceutical care in a way that can be closely defined and costed. They describe this as an integrated pharmaceutical care framework. Based on patient activities and the medical specialist's treatment plan, this frame-

work aims to contain all essential activities necessary to provide (cost-)effective, and patient-oriented care, whether from the outpatient or inpatient perspective. It breaks down the job into 29 activities, which are described functionally. The framework only describes the pharmaceutical content for each care activity, without indicating which person should do this activity. Thus, for example, instructing the patient on injections and inhalation might be delegated to a nurse as long as a hospital pharmacist is responsible for the quality.

Table 1: Integrated pharmaceutical care framework

Patient's activity	Physician's activity (based on the 6-step treatment plan)	Pharmacist's care activity
Patient goes to hospital/ outpatient department		1. Perform medicines reconciliation for inpatients 2. Perform medicines reconciliation for outpatients
Patient is in hospital/ outpatient department	1a. Diagnosis	3. Advise when medicines potentially influence the differential diagnosis (including intoxication)
	1b. Evaluate existing treatment	4. Review medicines (including clinical rules) 5. Intervene for at-risk patients (including clinical rules)
	2. Decide treatment objective (curative, symptomatic, preventive, palliative)	
	3. Decide treatment options (drug treatment/no drug treatment)	6. Develop drug policy (formulary) 7. Develop treatment protocols
	4. Select suitable patient-focused treatment	8. Individualise by genotyping 9. Individualise by TDM 10. Individualise drug formulation 11. Individual drug advice (dosage, contra-indications/co-medication)
	5a. Treatment and patient information decided: no drug treatment	12. Educate patient 13. Self-management
	5b. Treatment and patient information decided: drug treatment	14. Monitor medication (dose/interactions/contraindications/allergy) 15. Prepare IV medicines 16. Advise on administration and dosage schemes 17. Individualise drug distribution 18. Dispensing 19. Administration
	5c. Patient education	20. Inform individuals (dispensing information including instruction on medical measures) 21. Group education
	6a. Plan checks and follow-up (check: effectiveness, side effects, therapy compliance)	22. Guide on dosage/effect 23. Guide on side effects/interactions 24. Guide treatment compliance 25. Laboratory monitoring
	6b. Plan checks and follow-up (term check)	26. Check and follow up planning in hospital as well as at home
Patient leaves hospital/ outpatient department		27. Transfer to next care provider
Home situation		28. Distribution at home 29. Administration at home

## Care products with a minimum quality and price

The 29 components of the integrated pharmaceutical care framework are in fact 29 essential products of the pharmacy in the hospital. Each product, with its own minimum quality requirements, cost price and selling price, should therefore demonstrate measurable added value for patients, physicians or managers. In The Netherlands, a draft generic integrated pharmaceutical care framework has been

created. Currently, two indications (oncology and rheumatology) are being used to test the generic pharmaceutical care framework for missing items. Once detailed pharmaceutical care frameworks for these indications have been developed, they will be used as the recommended standards of pharmaceutical care for these indications. These frameworks are being developed in a multidisciplinary team together with inpatient and outpatient pharmacists, specialists, patients and specialist nurses.

*The development of this integrated pharmaceutical care framework is an ongoing process. Comments are welcome at [b.vandenbemt@maartenskliniek.nl](mailto:b.vandenbemt@maartenskliniek.nl)*

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## The Netherlands: stock production, extemporaneous preparation and reconstitution

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**U**ntil the beginning of the 1990s it was not uncommon to produce 30% of the total drug turnover in a Dutch hospital pharmacy. This was mainly for economic reasons.

Today, the perspective has changed; production in the pharmacy is no longer considered to be profitable. Availability and patient safety are the main drivers: when a product is not commercially available or not available in the required dosage form, it can be produced by a hospital pharmacy. But the volume produced has fallen dramatically and due to increasing legal quality standards, production has become a cost centre and no longer a profit centre.

In The Netherlands, it is generally agreed that the good manufacturing practice hospital pharmacy (GMP-H) is the minimum standard for production. The GMP-H is a guide to achieving GMP on any type and level of drugs manufacturing within hospital pharmacy. GMP-H requires investment in staff training, quality systems and facilities. At present, the majority of Dutch hospital pharmacies are 'GMP-H approved'.

In The Netherlands, one hospital pharmacy is only allowed to supply another under the following conditions:

- Commercially unavailable pharmaceuticals
- The supplier has formal GMP status
- There is a product dossier for every product.

So, Dutch hospital pharmacists have a choice: invest in production facilities or stick to extemporaneous preparation only.

At the moment, some relatively large hospital pharmacies have several clients. Expectations are that in the near future stock production will take place in academic centres and a few large regional production centres only. All other hospital pharmacies will limit production to extemporaneous preparation and obtain the other necessary products from the centres.

A new activity is the support of reconstitution on the wards. This process is managed using a practical guideline issued by the Dutch Association of Hospital Pharmacists and the Dutch Association of Nurses. The quality of reconstitution

can be increased by the pharmacy taking over this function, by supplying ready-to-administer drugs in syringes and by training.

The Netherlands has a recently updated textbook titled *Recepteerkunde* with practical information about the design and preparation of medicines in a pharmacy including the care of medicines as a product. In other words, it is about preparation in the broadest sense of the word. The book contains many modern formulations, figures and pictures.

We hope EAHP will support the issue of an international version in English.

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