

The future of preparations in hospital pharmacies

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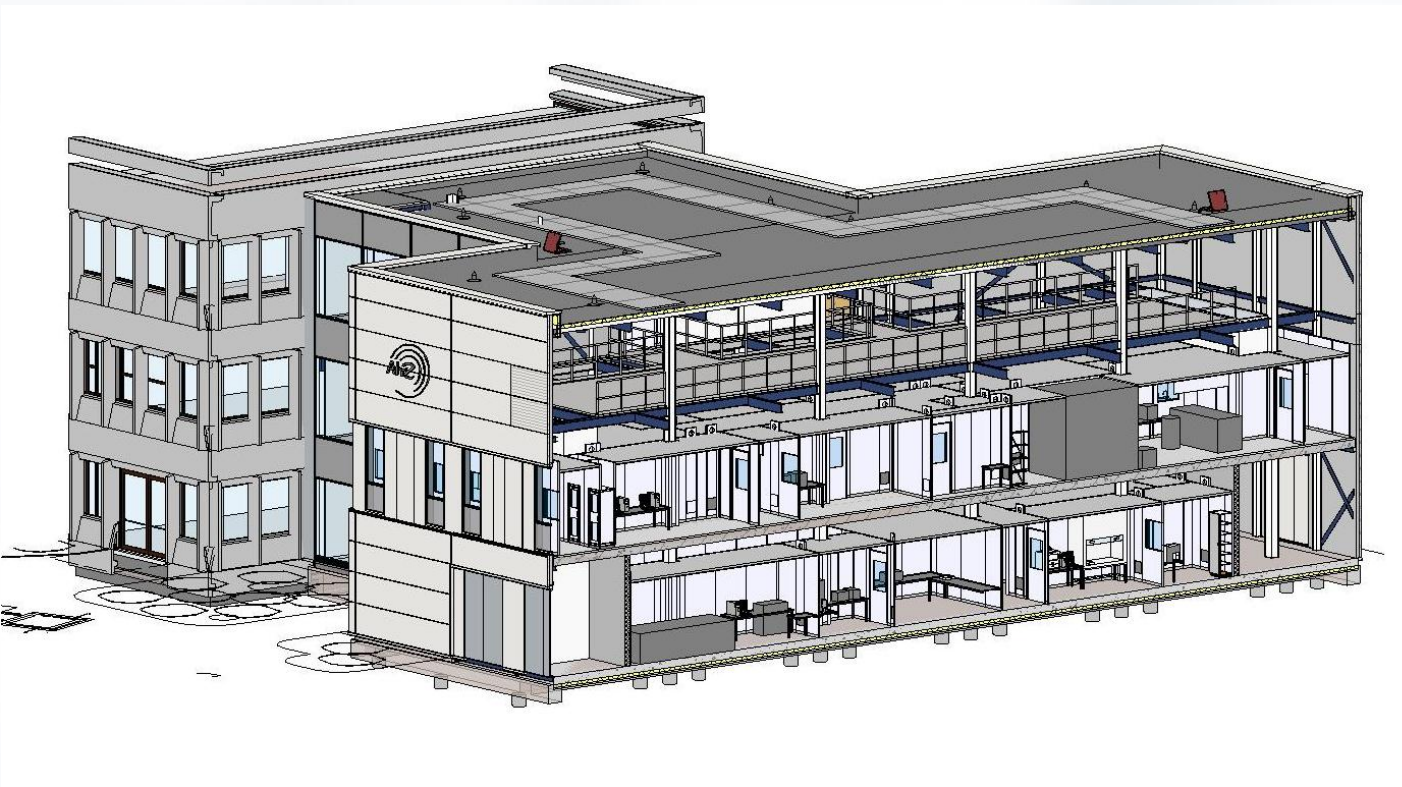
- 264 year (founded 1749)
- 6500 beds in 28 organisations
 - 6 hospitals (2500 beds)
 - 21 nursing homes (3000 beds)
 - 1 psychiatric hospital (500 bedden)
- 80×10^6 euro turnover of drugs
- 290 employees 35 pharmacists, 120 technicians

Central Hospital Pharmacy, The Hague, The Netherlands

Apotheek Haagse Ziekenhuizen 2015



OVERZICHT BEREIDINGEN



Technical area

Sterile preparation

Non-sterile
preparation

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ZICHT VANAF WANDELPAD



Content

- Preparation in hospital pharmacies:
 - Professional view
 - View by Inspectorate and legislation
 - Policy and vision beyond 2015
 - Discussion

Why do we prepare? Because:

1. A product is needed in therapy but not available in the market (fenylefrine injection, procainamide injection, quinine injection)
2. Drug shortages (temporarily or permanent) labetolol, isoprenaline
3. *Investigator initiated* research with medicines
4. Medication safety: RTU morfine, KCl
5. Easy to administer: RTA (syringes filled by the pharmacy)
6. Individualised therapy: dermatology, dosages for children

Pediatric formulations; availability oral liquids

- Antibiotics: ☺

Not commercial available:

- Antiepileptics (fenobarbital, fenytoine, lamotrigine)
- Diuretics (spironolacton, furosemide, hydrochloorthiazide)
- Ace-inhibitors, Beta blockings agents, Calcium channel inhibitors
- Ursochol, Coffeine, Benzodiazepinen, Steroids, Cytostatica
- Antiviral drugs (Valaciclovir, Valganciclovir)
- Immunosuppressive drugs (Tacrolimus)
- Other: sildenafil, bosentan, sevelamer

Pediatric formulations

- Inventory at the 8 university centres on pediatric extemporaneously preparations in 2008
- Selection of preparations to be standardized
- Pharmaceutical development of pediatric liquids by Laboratory of Dutch Pharmacists (WINAP)
- Nationwide implementation through Dutch Expertise centre Pediatric Pharmacotherapy
- Preparation and distributing by GMP (hospital) pharmacies
- Purchasing drugs internationally

6 Mercaptopurine liquid

- 6 Mercaptopurine Capsules vs liquid
- 20 ALL patients
- bioequivalence
- preference



RTU example: noradrenalin available in 1 mg = 1 ml while 50 mg = 50 ml is used



Service and
patient safety

RTA preparation in hospital pharmacy

- Infusion pumps
 - Elastomer pumps (e.g. Easypump[®], Folfusor[®])
 - Cartridges (e.g. CADD)
 - ...
- Syringes
 - Smartfiller[®]
 - Rapid-Fill[®]
 - ..
 - Robotics





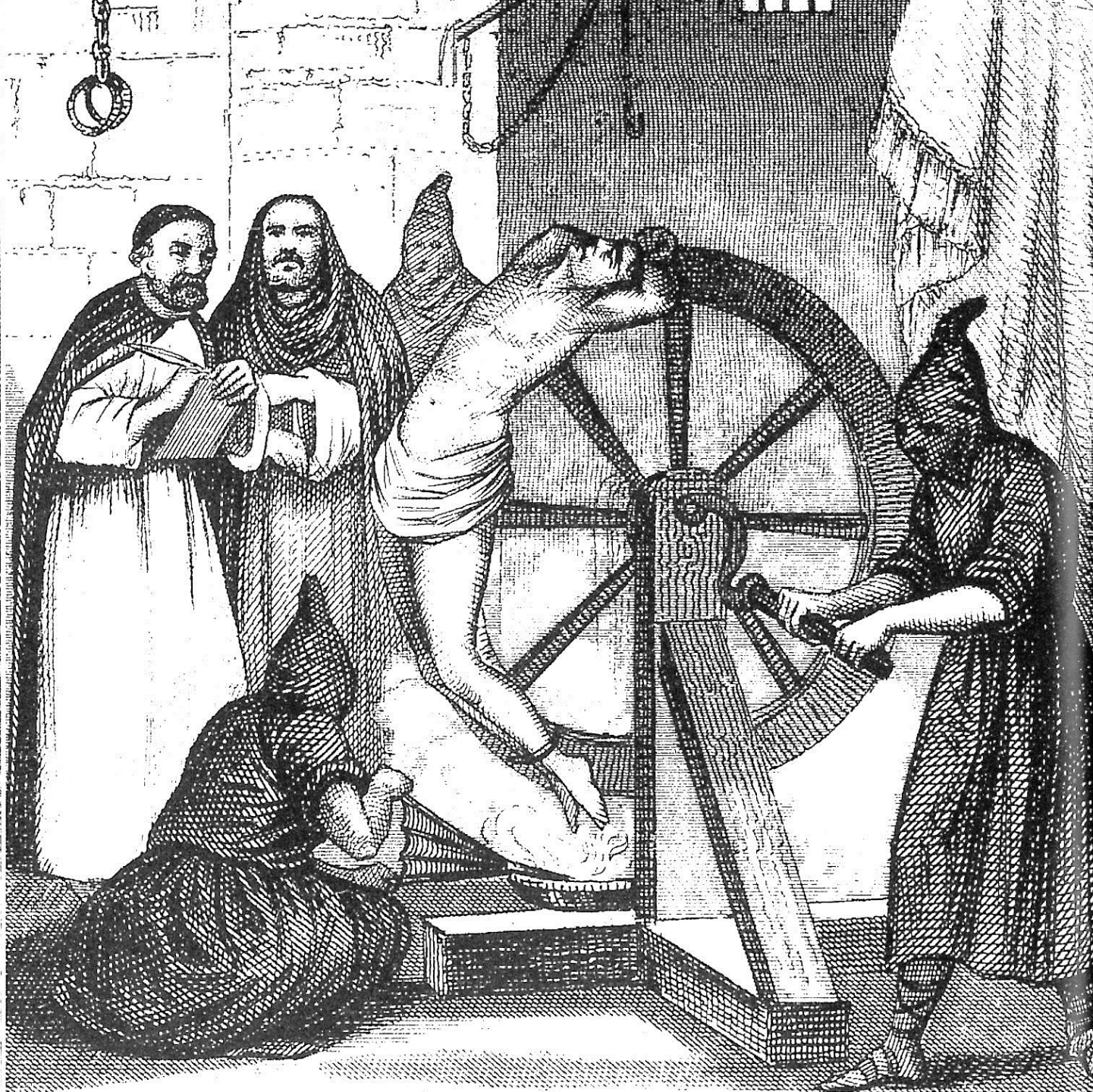
Technological developments

- Large scale RTA's (Efficiency)
- Isolators (safety)
- replacement human handling (Safety)
- Robotics

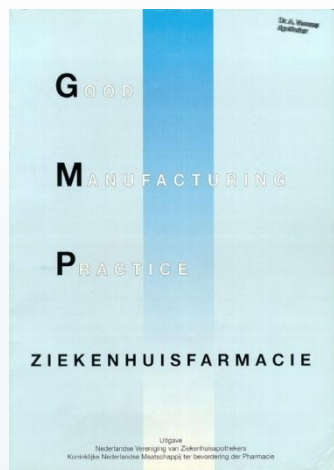


Preparation and Legislation

- In accordance with quality legislation e.g.:
 - premises
 - organisation
 - QA
 - product dossiers
 - Risk management
- Which legislation?
 - Confusing?
 - Though!



Legislation: confusing?



PHARMACEUTICAL INSPECTION CONVENTION
PHARMACEUTICAL INSPECTION CO-OPERATION SCHEME

PE 010-3
1 October 2008

PIC/S GUIDE TO GOOD PRACTICES
FOR THE PREPARATION OF
MEDICINAL PRODUCTS IN
HEALTHCARE ESTABLISHMENTS



**Resolution CM/ResAP(2011)1
on quality and safety assurance requirements for medicinal products
prepared in pharmacies for the special needs of patients**

*(Adopted by the Committee of Ministers on 19 January 2011
at the 1103rd meeting of the Ministers' Deputies)*

The Committee of Ministers, in its composition restricted to the representatives of the States Parties to the Convention on the Elaboration of a European Pharmacopoeia¹ (ETS No. 50),

Situation in The Netherlands

- Geneesmiddelenwet (Law on drugs; Drugs act)
- No drugs on the market without a market authorisation
- Two exemptions:
 - Preparation in a pharmacy prescribed by a physician
 - GMP-Z in hospitals
 - Richtlijn bereiden in community pharmacies
 - Deliveries between **pharmacies** are permitted
 - GMP!
 - Product file
 - Therapeutic added value
 - Not available in the market

European GMP

Annexes

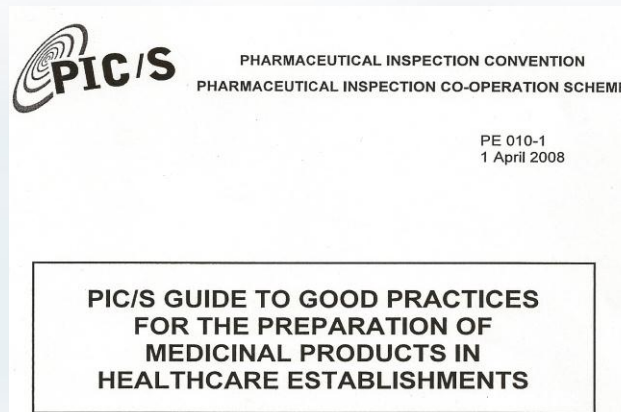


GMP-H

Investments!!!

Situation in Belgium

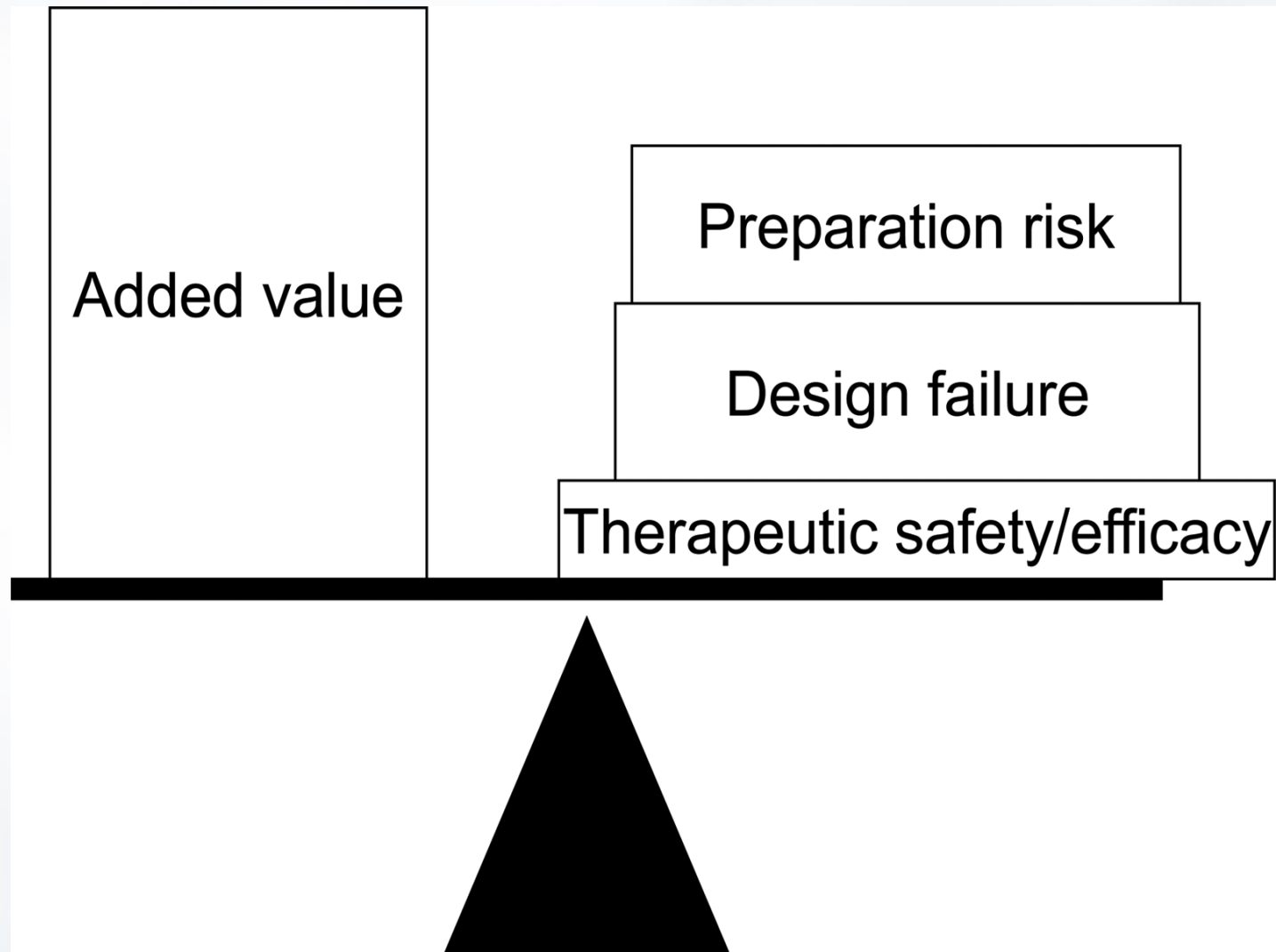
Nationale wet op de geneesmiddelen
Delivery between pharmacies



Professional standards?

Common interest BVZA/ABPH and NVZA!

- Delivery between pharmacies legally allowed!
 - To date its not in European legislation (2001/83)
 - Necessary because of efficiency
- Professional standard for local activities
 - Patient care and not trade!
 - Added value is a professional decision



Industrial GMP



PE 009-9

Pharmacy GMP??



PE 009-10

Resolution

Europe



- Resolution CM/ResAP(2011)1
on quality and safety assurance requirements for medicinal products
prepared in pharmacies for the special needs of patients (Raad van
Europa 19 jan 2011)
- Ph EUR: Pharmacy Preparation

Resolution: Based on survey

- Large variation between countries
- QA gap between pharmacy and industrial preparation
- With a view to **avoiding quality and safety gaps between medicinal products prepared in pharmacies and those prepared on an industrial scale**, recommends that the governments of the States Parties to the Convention on the Elaboration of a European Pharmacopoeia adapt their regulations in accordance with the principles set out in the present resolution (reference to GMP, PIC/s Ph Eur)
- **added value of pharmacy preparations** and responsibilities of health care professionals

Resolution (2)

- product dossier; (do not underestimate!)
- marketing authorisation; (scale!)
- labelling;
- compliance with pharmacopoeial requirements;
- reconstitution of medicinal products; wards
- authorisation for pharmacies

Resolution (3)

- transparency and safety; (reporting quality and safety)
 - rational use;
 - surveillance;
 - communication and information to patients;
 - distribution of pharmacy preparations. (GDP)
-
- Risk assessment pharmacy preparation: route of administration, batch scale, potency, process, distribution
-
- In order to implement the present resolution, States Parties to the Convention on the Elaboration of a European Pharmacopoeia will have to supplement it through additional practical guidance, taking into account the national frameworks.

5.2. Risk assessment of a pharmacy preparation

This risk assessment should consider:

- a.* dosage form and administration route;
- b.* amount prepared;
- c.* pharmacological effect of the medicinal product for the envisaged route of administration;
- d.* therapeutical window (dose range for therapeutic doses);
- e.* type of preparation process;
- f.* supply.

Risk assessment in practice

- Each decision criterion has a graded risk factor ranging from 1 to 5. The multiplication of these risk factors results in a number
- If the number is higher than 100 the preparation is considered a “high-risk preparation”;
- It is recommended that the GMP Guide be used as a reference for an appropriate quality system for “high-risk preparations”, and that the GPP Guide be used for “low-risk preparations”

Examples (high risk = GMP or low risk = PIC/s)

- Parenteral: high risk
- Handling of sterile medication: high risk (morphine cartridge)
- Suppository: high risk (morphine, carbamazepine) or low risk (metoprolol)
- Liquid: high risk (methadon)
- Ointment: low risk
- **Consequences and Future??**



SWOT preparation

S

- Unique service
- Knowledge
- Direct contact

W

- Old premises
- Environment (GMP)
- Quality systems

O

- Medication safety
- Focus efficiency

T

- Legislation
- No personnel
- Compounding centers
-

Priorities

- Cooperation for stock and specialistic preparations
- High risk medication on the wards
- Keep in mind:
 - Added value and patient care
 - Risk evaluation

Cooperation and Commercial developments



- Common in Europe
- Threat or opportunity?
- Cooperation?
- Initiatives by pharmacists?
- Keep in mind the added value



Centrale Bereidings Apotheek Nederland | Nieuwsbrief

High risk medication on the wards: wrong person, wrong place, wrong moment



Preparations on the wards

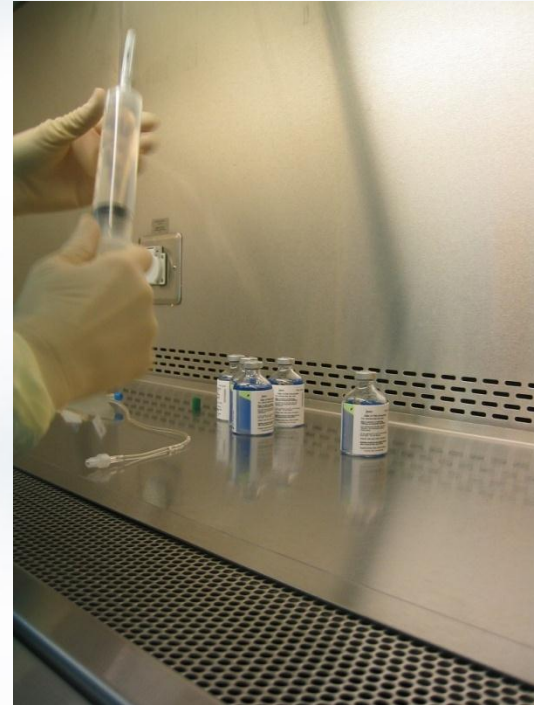
- Pharmacist has knowledge
- Initiative is expected (Resolution)
- Work together
- Dare to make a choice

Consider a strategy

- Pharmacy takes over preparations
- All??
- Not possible; therefore training and instructions)
 - Education program
 - Information data base (Dutch national database parenterals = Handboek parenteralia)

Preparation prior to use: risk based approach

- Central:
 - high risk medication
 - Patient based cytostatics
 - Technician
 - Efficiency: RTU, RTA
- Satellite
 - As much as possible
 - Quality
 - Efficiency
- Patient bed
 - Immediate use



Instruction map for preparation on the ward



1. handboek raadplegen



2. desinfectie werkblad met alcohol 70%



3. klaarleggen



4. etiket schrijven



5. controle



6. handdesinfectie met handalcohol , handen droogwrijven



7. handschoenen



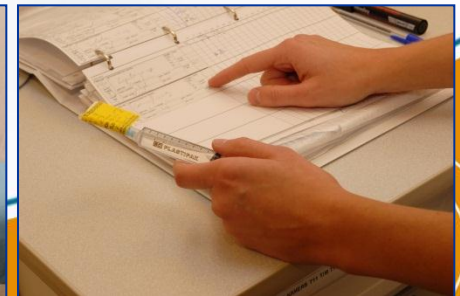
8. desinfectie aanprikpunt



9. bereiding



10. etiket plakken

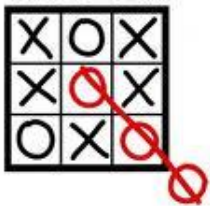


11. toediencontrole

Take home messages

- *Preparation = patient care (not trade)*
- *Cooperation is paramount (economics)*
- *Preparation and handling on the ward needs input and initiative from the hospital pharmacist*
- *Risk assessment!*
- *Product knowledge is paramount!*
- *Common interest for B and NL associations*
- **Preparations are Indispensable and have a clear added value**

**THINK
OUTSIDE
THE BOX**



Thank you for your attention!

- Questions
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