(Re-)engineering clinical pharmacy services

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Conflicts of interest

- Nothing to disclose

Plan

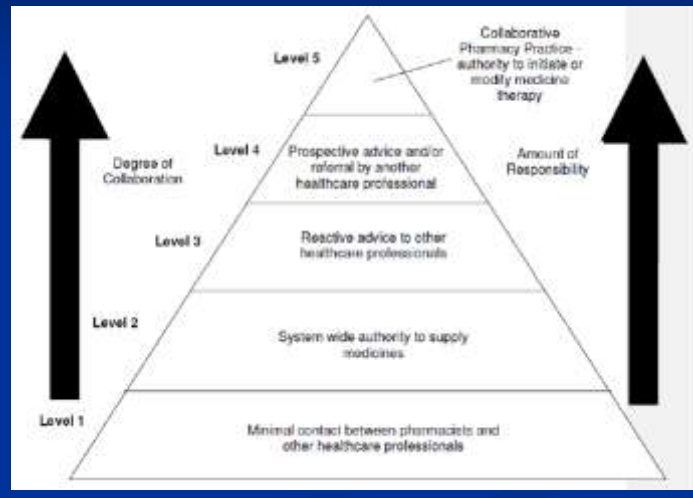
- Introduction
- Vision
- Standards of practice and metrics
- Efficiency / cost-effectiveness
- Perspectives

INTRODUCTION

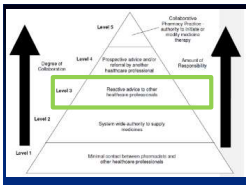
- What are we talking about?
- Models of practice and variability

- **Engineering**
  - From Latin *ingenium*, meaning "cleverness" and *ingeniare*, meaning "to contrive, devise"
  - the application of scientific, economic, social, and practical knowledge in order to design, build, maintain, and improve
    - (structures, machines, devices, systems, materials and processes)
    - → Clinical pharmacy services

Models of pharmacy practice

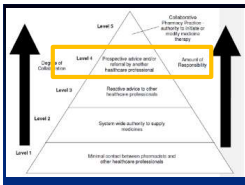


FIP reference paper collaborative practice, 2009 – www.fip.org/statements



Level 3

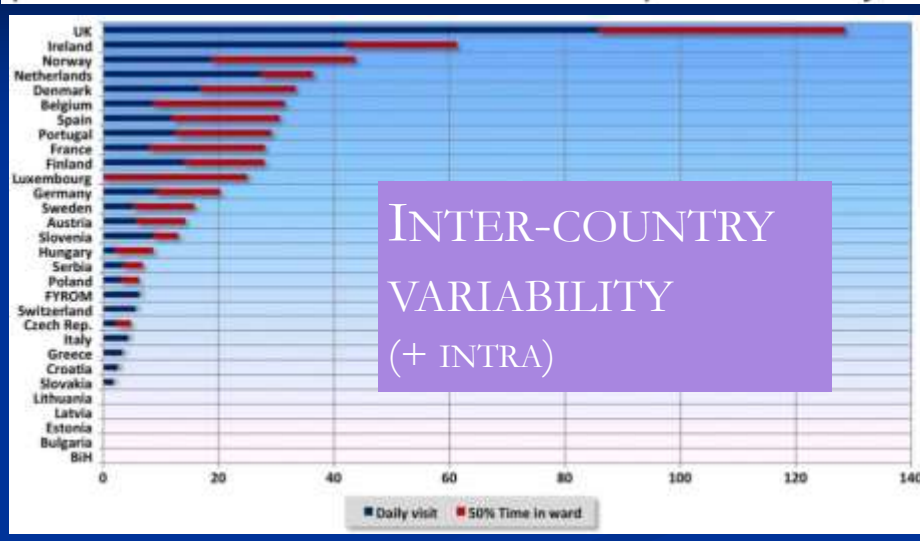
- Pharmacists are expected to assess a prescription before it is dispensed
- Prescription intervention occurs after a prescription has been generated → <u>reactive</u> service
- Large variability possible within this level
- Examples:
  - ward pharmacists spending 1-2 h/day per ward
  - Validation of prescriptions



Level 4

- The pharmacist becomes part of the decision to initiate or modify a prescription = <u>proactive</u>
  - Inclusion in the team making decisions
    - Attending ward rounds
  - or referral by the prescriber to the pharmacist for advice
    - For specific medicines (eg TPN) or medication review
- No change to the patient's treatment is made without the agreement of the prescriber

EAHP survey 2010 on hospital pharmacy in Europe: parts 4 and 5. Clinical services and patient safety



Frontini et al. Eur J Hosp Pharm 2013;20:69-73

EAHP survey 2010

- Only 6% of pharmacies have pharmacists spending at least 50% of their time on the ward
  - 34% of US hospitals have pharmacists working on the ward for 8h/day
- 40% of hospital pharmacies offer clinical services occasionnally (range by country 3.6-79.2%)
- Only limited changes since the 2005 survey

Frontini et al. Eur J Hosp Pharm 2013;20:69-73

Engineering CPSs will be discussed at **3 different**

- European
- National

- Local

(RE)ENGINEERING: DO WE HAVE A VISION FOR THE FUTURE?

Please raise you hand if…

- In your country you are aware of any recent document/white paper describing
  - A vision for clinical pharmacy
- You work as a clinical pharmacist in a hospital
  - There is a vision on the development of clinical pharmacy for the next 5 years in your hospital

Vision : work in progress?

- Europe
  - May 2014; Objectives : « to set out the future direction of the profession », how it can further serve the patient and collaboration with other health professionals

- United States
  - In contrast with pharmacy education's thorough embrace of clinical pharmacy, grassroots pharmacy practice seems to have suffered from a lack of vision and will (Zellmer AJHP 2010)

Country-level: Belgium

- Pilot projects 2006-2013
- Implementation and evaluation at the national level
- Vision
- No agreed standards


Vision sur le développement de la pharmacie clinique au sein des soins pharmaceutiques dans les hôpitaux belges

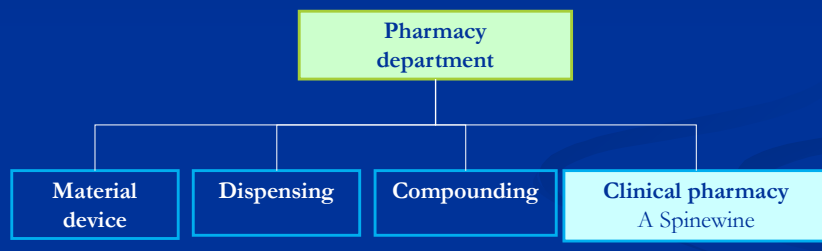
Denmark

- National definition of clinical pharmacy
- Three levels
  - Patient
  - Ward
  - Management
- National strategy 2012-2015

Kjeldsen and Nielsen. Eur J Hosp Pharm 2012;19:539-40

Hospital level

- 2007 → 2010 → 2014



5 pharmacists (3,5 FTE)
Qualified
« Level 4 » on 3 wards + transversal activities

Pharmacy department – Strategic plan 2010 - 2015

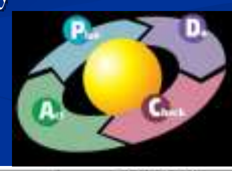
VISION 	Assurer une prise en charge médicamenteuse de qualité irréprochable en toutes circonstances pour tous les patients	Donner accès à de l'information sur les médicaments à la convenance de nos clients et à tout moment de la journée	**Expand clinical pharmacy activities**	Fournir des injectables pour un regroupement hospitalier francophone	Etre une pharmacie de référence en francophonie en termes de formation et de recherche
VALUES	*Ecoute*	*Communication*	*Professionnalisme*	*Transparence*	*Equipe*	*Epanouissement*
STRATEGIES 	Standardiser et sécuriser les processus	Assurer la pérennité financière de la pharmacie	To expand clinical pharmacy activities and to evaluate clinical and economic impact	Etre le leader dans le domaine des injectables	Etre un centre réputé pour l'excellence de sa formation et sa participation à la recherche
INDICATORS 	✓ Enquête de satisfaction sur la visibilité ✓ Polyvalence de l'équipe ✓ Incidents graves rapportés / nb incidents ✓ % non-conformité / nb ordonnances	✓ Montants facturés / montants facturables ✓ Evolution médicaments HF	✓ Satisfaction survey ✓ % inpatients with clinical pharmacy record ✓ % interventions accepted ✓ Nb projects with cost benefit	✓ % injectables préparés par automatisation ✓ % injectables conformes ✓ Enquête de satisfaction sur la mise à disposition des dilués	✓ Enquête de satisfaction stagiaires ✓ Nb posters / an ✓ Nb articles dans revues référencées / an

Developing strategy

- Priorities / needs identification
  - Initially:
    - Risk of ADEs
    - Willingness / demand of chief physician / nurse
  - Then:
    - Cost of medications
    - (Accreditation standards)

Developing strategy

- Priorities / needs identification
  - Examples
    - 0,5 FTE clinical pharmacist focusing on « deviant » DRGs
      - Prescribing procedures for anesthetics; colloid solutions;…
    - New ward-based activity: pneumology
      - € aspects:antibiotics; inhalers;…



- PDCA

OBSERVATION	ANALYSE	EXEMPLES	PROPOSITIONS
PRESCRIPTION			
- Traitement du domicile : [illegible]	- [illegible]	- [illegible]	- [illegible]

STANDARDS OF PRACTICE METRICS

Please raise you hand if…

- You work as a clinical pharmacist
  - You have defined clinical pharmacy standards of practice/ metrics
  - There has been internal/external audit of your practice

« Hospital pharmacy manufacturing is subject to strict (inter)national standards »

« However, there has been very little attention focused on standards in relation to clinical pharmacy practice. »

Fitzpatrick, Pharm World Sci 2005;27:191-6

Northern Ireland

- Clinical pharmacy standards, 2009
  - Basic standard requirements & advanced requirements

Acute

1 Medicine History Interview
2 Medicine Therapy Monitoring
3 Prescription Monitoring and Review
4 Prevention, Detection, Assessment and Management of Adverse Drug Reactions
5 Prevention, Assessment and Management of Drug Interactions
6 Therapeutic Drug Monitoring
7 Prevention, identification, management and reporting of medication incidents
8 Multidisciplinary Working
9 Provision of Medicines Information Advice by Pharmacists
10 Discharge
11 Patient Medicine Education

General Support

12 Education and Training
13 Resources
14 Staffing Levels and Structure
15 Documentation
16 Quality of Clinical Pharmacy Services
17 Health Promotion
18 Pharmacoeconomic Evaluation of the use of Medicines

Northern Ireland

STANDARD 3
Prescription Monitoring and Review

Basic Standard Requirements

All patients' prescription charts are monitored and reviewed in conjunction with the patient's medical notes and relevant medical laboratory results by a pharmacist at regular intervals. The recommended intervals are:

- Acute wards — once daily
- Intermediate stay wards — once weekly
- Rehabilitation wards, community hospital wards — once weekly
- Long stay psychiatric/ learning difficulties — once a month

3.1 A local SOP exists for prescription monitoring and review

3.2 All patients' prescription charts are monitored and reviewed by a pharmacist by the next working day after admission

3.3 Prescription monitoring and review is repeated at regular intervals as defined above throughout the patient's admission.

3.4 The patient's administration record is reviewed to determine non-administration and to resolve any issues e.g. patient nil by mouth.

3.5 Pharmacists endorse prescriptions to add clarity to the original prescription, if applicable.

3.6 A local SOP exists for prescription endorsement by pharmacists.

3.7 If a medication incident or a near miss has occurred it is reported according to the local policy/ procedure for reporting medication incidents or near misses.

Advanced requirements

3.8 A pharmacist reviews all prescriptions for 'high risk' drugs (except in emergency situations) before the first dose is dispensed or administered.

STANDARD 13
Resources

Table 1: Clinical Pharmacy Staffing Levels to Provide a Clinical Pharmacy Service

Hospital Area	Pharmacist Ratio	Technician Ratio
General Medicine Cardiology Paediatrics Acute Psychiatry Acute Elderly Care General Surgery Oncology Inpatients Haematology Inpatients Other comparable specialties	1 pharmacist per 40 beds (± 10 beds)	1 technician per 40 beds (± 10 beds)
Maternity / Obs & Gynae ENT Orthopaedics Long stay Psychiatric Long stay learning difficulties Long stay Elderly Care Other comparable specialties	1 pharmacist per 60 beds (± 10 beds)	1 technician per 60 beds (± 10 beds)
ICU / ICCU / HDU PICU / Neonatal Renal Haemodialysis Other comparable specialties	0.1 pharmacist per bed/ cot station	0.1technician per bed/ cot station
Accident and Emergency	1 pharmacist per 100,000 attendances	1 technician per 100,000 attendances
Cystic Fibrosis Patients HIV Patients Other comparable specialties	0.3 pharmacist per 50 registered patients	0.3 technician per 50 registered patients
Pharmacy led Clinics	0.2 pharmacist per clinic	-
Specialist Teams	0.5 pharmacist per team	-
Clinics - GTD	0.1pharmacist per 1000 patient visits	-

United Kingdom

Australia

- **Standards of practice for clinical pharmacy services**
  - Medication reconciliation
  - Assessment of current medication management
  - Clinical review, TDM and ADR management
  - Medication management plan
  - Providing medicines information
  - Facilitating continuity on transition between settings
  - Interdisciplinary care planning
  - Prioritising clinical pharmacy services
  - Staffing levels and structure
  - Training and education
  - Participating in research
  - Pharmacy technicians supporting clinical pharmacy services
  - Documenting clinical activities
  - Improving the quality of service
  - Clinical competency assessment tool

Journal of Pharmacy Practice and Research vol 43, 2 (suppl), 2013

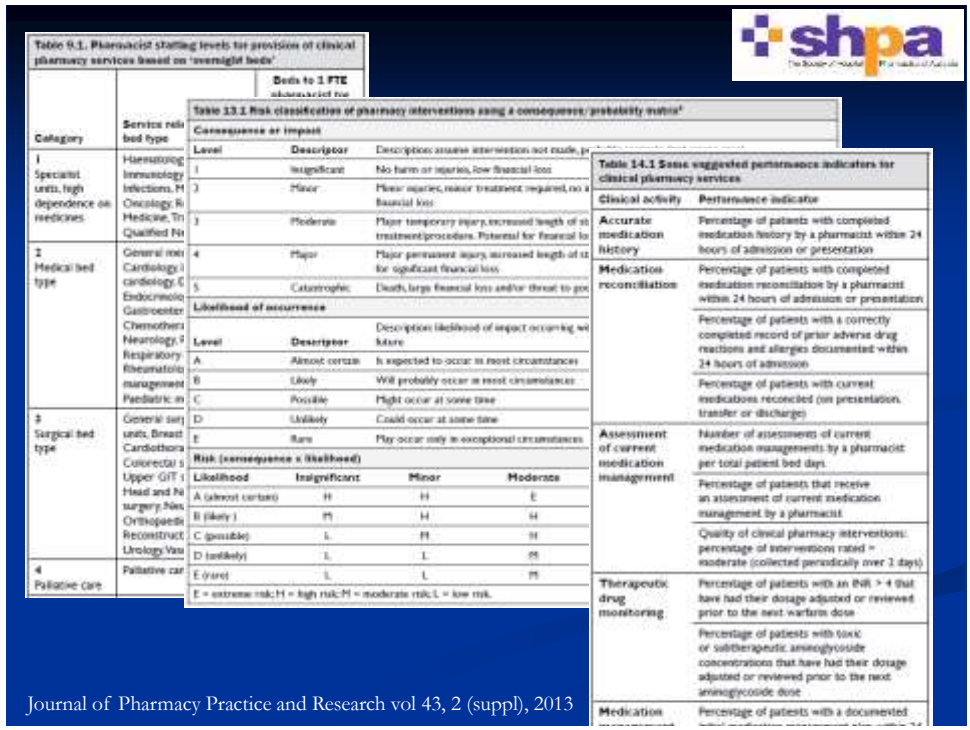


Table 9.1. Pharmacist staffing levels for provision of clinical pharmacy services based on 'overnight beds'

Category	Service relative to bed type	Beds to 1 FTE pharmacist (no overnight beds)	Beds to 1 FTE pharmacist (overnight beds)
1 Specialist units, high dependence on medicines	Haematology, Immunology, Infectious, M, Oncology, R, Medicine, Tr, Qualified Ne	10	5
2 Medical bed type	General, Cardiology, cardiology, C, Endocrinolo, Gastroenter, Chemothera, Neurology, R, Respiratory, Rheumatolo, management, Paediatric in	20	10
3 Surgical bed type	General surg, units, Breast, Cardiothora, Colorectal s, Upper GIT, Head and Ne, surgery, Neu, Orthopaedic, Reconstruct, Urology, Vas	20	10
4 Palliative care	Palliative car	20	10

Table 13.1 Risk classification of pharmacy interventions using a consequence/probability matrix[1]

Consequence or impact

Level	Descriptor	Description (assume intervention not made, p
1	Insignificant	No harm or injuries, low financial loss
2	Minor	Minor injuries, minor treatment required, no s financial loss
3	Moderate	Major temporary injury, increased length of st treatment/procedure. Potential for financial lo
4	Major	Major permanent injury, increased length of st for significant financial loss
5	Catastrophic	Death, large financial loss and/or threat to go

Likelihood of occurrence

Level	Descriptor	Description (likelihood of impact occurring wi future
A	Almost certain	Is expected to occur in most circumstances
B	Likely	Will probably occur in most circumstances
C	Possible	Might occur at some time
D	Unlikely	Could occur at some time
E	Rare	May occur only in exceptional circumstances

Risk (consequence x likelihood)

Likelihood	Insignificant	Minor	Moderate
A (almost certain)	H	H	E
B (likely)	M	H	H
C (possible)	L	M	H
D (unlikely)	L	L	M
E (rare)	L	L	M

E = extreme risk; H = high risk; M = moderate risk; L = low risk.

Table 14.1 Some suggested performance indicators for clinical pharmacy services

Clinical activity	Performance indicator
Accurate medication history	Percentage of patients with completed medication history by a pharmacist within 24 hours of admission or presentation
Medication reconciliation	Percentage of patients with completed medication reconciliation by a pharmacist within 24 hours of admission or presentation
	Percentage of patients with a correctly completed record of prior adverse drug reactions and allergies documented within 24 hours of admission
	Percentage of patients with current medications reconciled (on presentation, transfer or discharge)
Assessment of current medication management	Number of assessments of current medication management by a pharmacist per total patient bed days
	Percentage of patients that receive an assessment of current medication management by a pharmacist
	Quality of clinical pharmacy interventions: percentage of interventions rated = moderate (collected periodically over 2 days)
Therapeutic drug monitoring	Percentage of patients with an INR > 4 that have had their dosage adjusted or reviewed prior to the next warfarin dose
	Percentage of patients with toxic or subtherapeutic aminoglycoside concentrations that have had their dosage adjusted or reviewed prior to the next aminoglycoside dose
Medication	Percentage of patients with a documented

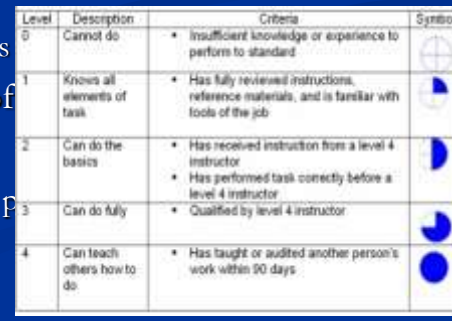
Journal of Pharmacy Practice and Research vol 43, 2 (suppl), 2013

Standards of practice

- Job description
  - Clinical pharmacist
  - Chief clinical pharmacist
  - (Semi)annual evaluation

Standards of practice

- Procedures: examples
  - Searching for medicines information
  - Drug history and medication reconciliation
  - Documenting clinical pharmacy activities for individual patients
    - Making intervention notes
  - Reviewing prescription of
  - Students
    - Presenting a clinical case; p
      …



Level	Description	Criteria	Symbol
0	Cannot do	• Insufficient knowledge or experience to perform to standard	
1	Knows all elements of task	• Has fully reviewed instructions, reference materials, and is familiar with tools of the job	
2	Can do the basics	• Has received instruction from a level 4 instructor • Has performed task correctly before a level 4 instructor	
3	Can do fully	• Qualified by level 4 instructor	
4	Can teach others how to do	• Has taught or audited another person's work within 90 days	

Metrics/documenting

WHY?

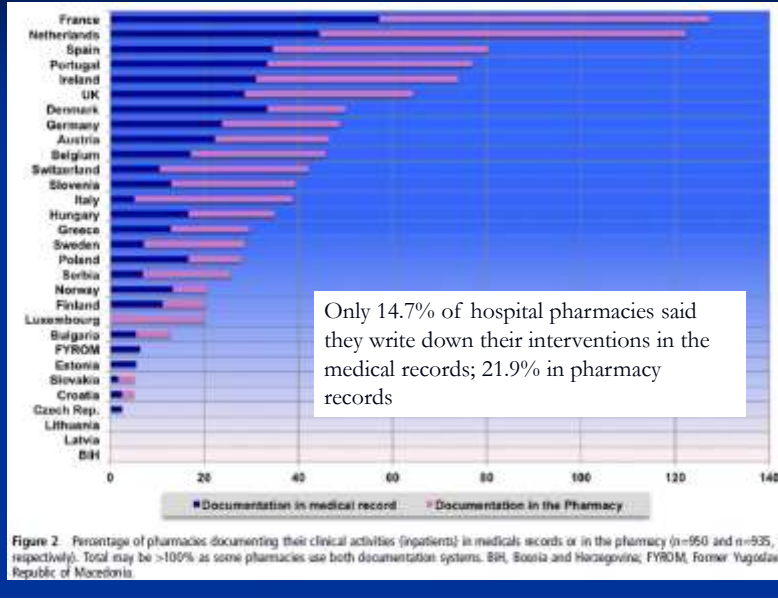
- Sharing information with other HCPs
- Professional accountability
- Determine efficiency and
  quality of
- gic planning

HOW?

Use strategies to ensure that workload documenting does not take up a large component of clinical pharmacists' time and distracts from providing clinical services »

SHPA, J Pharm Pract Res 2013;43;2(Suppl)

Documenting activities



Only 14.7% of hospital pharmacies said they write down their interventions in the medical records; 21.9% in pharmacy records

Figure 2. Percentage of pharmacies documenting their clinical activities (inpatients) in medicals records or in the pharmacy (n=950 and n=935, respectively). Total may be >100% as some pharmacies use both documentation systems. BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

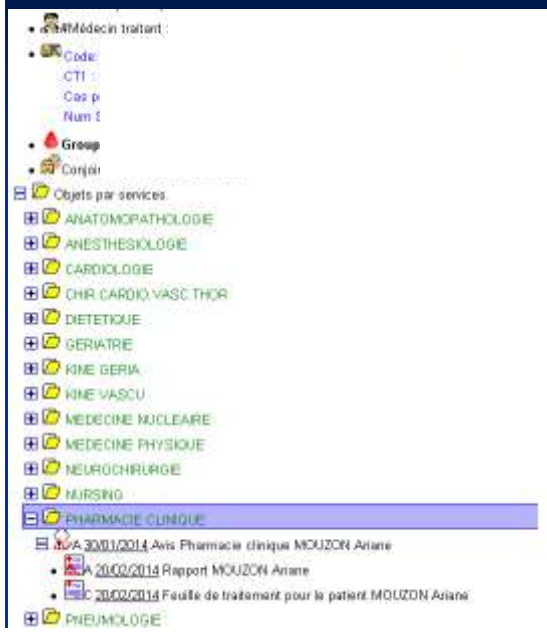
Metrics/documenting

WHY?	HOW?
▪ Sharing information with other HCPs ▪ Professional accountability	▪ Routinely: Electronic clinical pharmacy record embedded in EMR

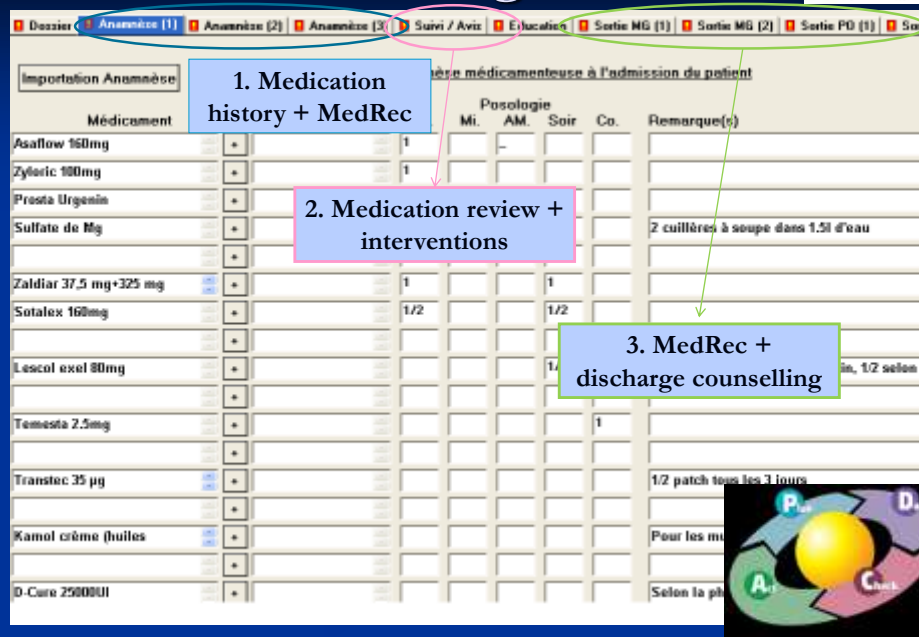
▪ Determine efficiency and quality of service
  ▪ Workload
  ▪ KPIs
  ▪ …
▪ Assist in strategic planning
	▪ Routinely / periodically
	▪ Research projects

SHPA

Documenting activities



Documenting activities



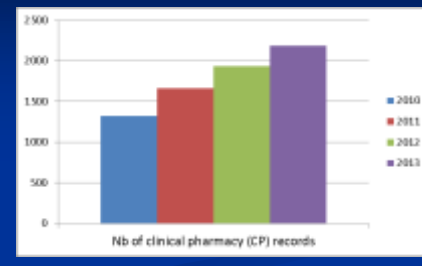
Metrics/documenting

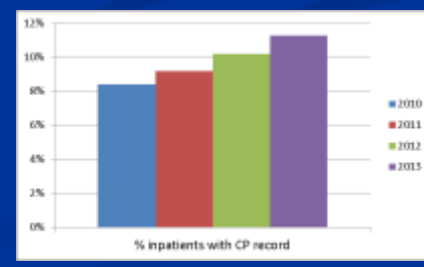
WHY?	HOW?
Sharing information with other HCPs	Routinely: Electronic clinical pharmacy record embedded in EMR
Professional accountability	
Determine efficiency and quality of service - Workload - KPIs - …	Routinely / periodically
Assist in strategic planning	Research projects

SHPA

Metrics: example 1: routine

Service	Nombre	Nbre d'anamnèse encodé
CARDIOLOGIE	15	9
CHIR.CARDIO.VASC.THOR	7	2
CHIRURGIE GENERALE	174	126
DOULEUR CHRONIQUE	1	0
GASTROENTEROLOGIE	14	4
GERIATRIE	115	75
HEMATOLOGIE	2	1
MEDECINE INTERNE GENERALE	5	2
MEDECINE PHYSIQUE	3	0
NEUROCHIRURGIE	4	1
NEUROLOGIE	6	2
ONCOLOGIE	3	1
ORL	2	0
ORTHOPEDIE	107	68
PNEUMOLOGIE	9	5





Metrics: example 2: periodic

- 4 weeks/year
  - Detailed recording of all activities and interventions

- Satisfaction survey (2011)
  - Physicians and nurses
  - Assist in future developments

Lean management and clinical pharmacy

- Clinical pharmacy record embedded in electronic patient record
- Closely linked to computerized prescribing order entry system (CPOE)
- Avoid duplicate work / information
  - Risk of errors!
  - Eg discharge medication list
- (semi)Automatic identification of high-risk patients/situations

Efficiency: doing « more with less »

- Patient-focus + process-focus time investment
- Empowering patients
- IT support

- Educational leaflet / posters
- Medication form; paper-based
- For HCPs: EMR modifications
- Soon: mHealth application: medication history (patients) and MedRec (HCPs)

Metrics 3: research informs strategic planning

Effect of a Collaborative Approach on the Quality of Prescribing for Geriatric Inpatients: A Randomized, Controlled Trial

Anne Spinewine, PhD, Christian Swine, MD,*§ Soraya Dhillon, PhD,† Philippe Lambert, PhD,‡ Jean B. Nachega, MD, MPH, DTM&H,*** Léon Wilmotte, MPharm,*† and Paul M. Tulkens, MD, PhD*†*

J Am Geriatr Soc

Implementation of Ward-Based Clinical Pharmacy Services in Belgium—Description of the Impact on a Geriatric Unit

Anne Spinewine, Soraya Dhillon, Louise Mallet, Paul M Tulkens, Léon Wilmotte, and Christian Swine

Ann Pharmacother

EFFECT OF A CLINICAL PHARMACIST INTERVENTION ON UNINTENTIONAL MEDICATION DISCREPANCIES AFTER DISCHARGE: A PROSPECTIVE COHORT STUDY

C. Claeys[1], C. Senterre[2], J. Nève[1], P.M. Tulkens[1], P. Debusschere[4], A. Spinewine[3,1]

COST-EFFECTIVENESS

- Necessary for re-engineering?

Research questions: cost-effectiveness

- Level 3 vs level 4 pharmacy practice?
  - « There was a division of opinion amongst chief pharmacists as to how best clinical pharmaci service can be provided withing the resource limitations:
    - provide a limited service to all wards
    - Provide a quality service to a limited number of wards (Fitzpatrick 2005)
- Inpatients vs outpatients?
- Prospective identification of high-risk patients?
  - Linda Dodds EJHP 2014
- …

In conclusion: (re-)engineering

- Move forward
  - … using a stepwise and rigorous approach
  - … being innovative
  - « The transformation of pharmacy practice will not march in a straight line toward some ultimate perfection » (Zellmer, Am J Health Syst Pharm 2010)
- Define clinical pharmacy practice standards
- Document, benchmark and evaluate level of practice
- Increase and optimise resources
- Research to better inform strategic planning

Thank you for your attention

Contact details

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