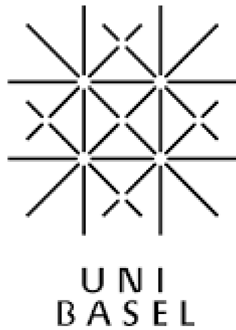


Clinical Pharmacy: much more than a Hospital-based Discipline

Swiss PharmaScience Day – 22. August 2017

Christoph Meier

Chefapotheker, Spitalapotheke, Universitätsspital Basel
&
Professor für Klinische Pharmazie und Epidemiologie
Departement Pharmazeutische Wissenschaften, Uni Basel

Clinical Pharmacy ?

Yes, but…

This is Clinical Pharmacy too!

www.baselstädtischerapothekerverband.ch

Int J Clin Pharm (2016) 38:1445–1456
DOI 10.1007/s11096-016-0385-3

RESEARCH ARTICLE

Current perceptions of the term Clinical Pharmacy and its relationship to Pharmaceutical Care: a survey of members of the European Society of Clinical Pharmacy

Tobias Dreischulte[1] · Fernando Fernandez-Llimos[2]

«Clinical pharmacy is that part of pharmacy that aims to develop and advance the appropriate and efficient use of medicines. In hospitals, the term Clinical Pharmacy is used to describe the **patient centered pharmaceutical activities performed in collaboration with other health professionals**. The Clinical Pharmacist has comple-ted specific training and is responsible for his actions.»

Swiss Association of Public Health Administration and Hospital Pharmacists (GSASA)

87 year old male patient, hospitalized for a percutaneous transluminal angiography with stent, discharged from the hospital with the following drugs:

Brand name	Active ingredient	Regimen
Aspirin cardio®	Acetylsalicylic acid 100 mg	1-0-0
Plavix ®	Clopidogrel 75 mg	1-0-0
Vascord HTC ®	Olmesartan 40 mg Amlodipin 10 mg Hydrochlorothiazide 25 mg	1-0-0
Torem ®	Torasemid 10 mg	1-0-0
Sortis ®	Atorvastatin 40 mg	0-0-1
Allopur ®	Allopurinol 300 mg	0-1/2-0
Condrosulf ®	Chondroitinsulfat 800 mg	0-0-1
Xanax ®	Alprazolam 0.25 mg	0-0-1/2 every 2nd day

BMI 28, stopped smoking 7 years ago, 3 glasses of wine/day, mentally fit.
TIA 3 years ago, hypertension, hypercholesterolemia, GFR 26 ml/min

Questions for the clinical pharmacist:

- ACE-inhibitor instead of AT2-antagonist?
- Dosage OK?
- Diuretics OK?
- Any suggestions for changes / therapy optimization?
- Patient eats a rather protein rich diet, is this a problem (renal function)?
- Low salt diet?

The same patient who leaves the hospital will show up in the community pharmacy half an hour later!

Rp.

Name: 7.2015

Vorname:

Geburtsdatum: 1958

– Rezept nur in Apotheke einlösbar. –

1 x	NEBILET Tabl 5 mg 98 Stk	1/2-0-1-0	Dauerrezept bis 16.07.2016
1 x	TRIATEC Tabl 5 mg 100 Stk	1-0-1-0	Dauerrezept bis 16.07.2016
1 x	ASPIRIN CARDIO Filmtabl 100 mg 98 Stk	1-0-0-0	Dauerrezept bis 16.07.2016
1 x	CRESTOR Filmtabl 10 mg 100 Stk	0-0-1-0	Dauerrezept bis 16.07.2016
1 x	BIOTIN Biomed forte Tabl 5 mg 90 Stk	1-0-0-0 vor der Mahlzeit	Dauerrezept bis 16.07.2016
1 x	MAGNESIOCARD Gran 5 mmol Citron alt 50 Beutel 5 g 10	1-0-0-0	Dauerrezept bis 16.07.2016

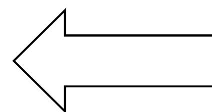
Dr. med.
Allgemein

Tel:
Fax:
ZSR:
GLN:

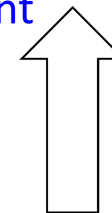
Dr. med.
Facharzt für Allgemein

pharmama.ch

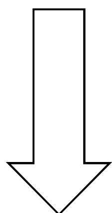
aerztezeitung.de



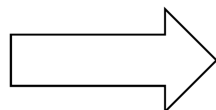
Medication management



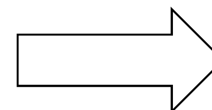
Hospitalization



BPMH
('best possible medication history')

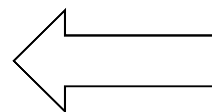


Hospitalization

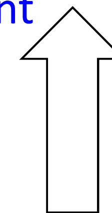


Discharge

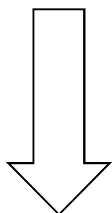
aerztezeitung.de

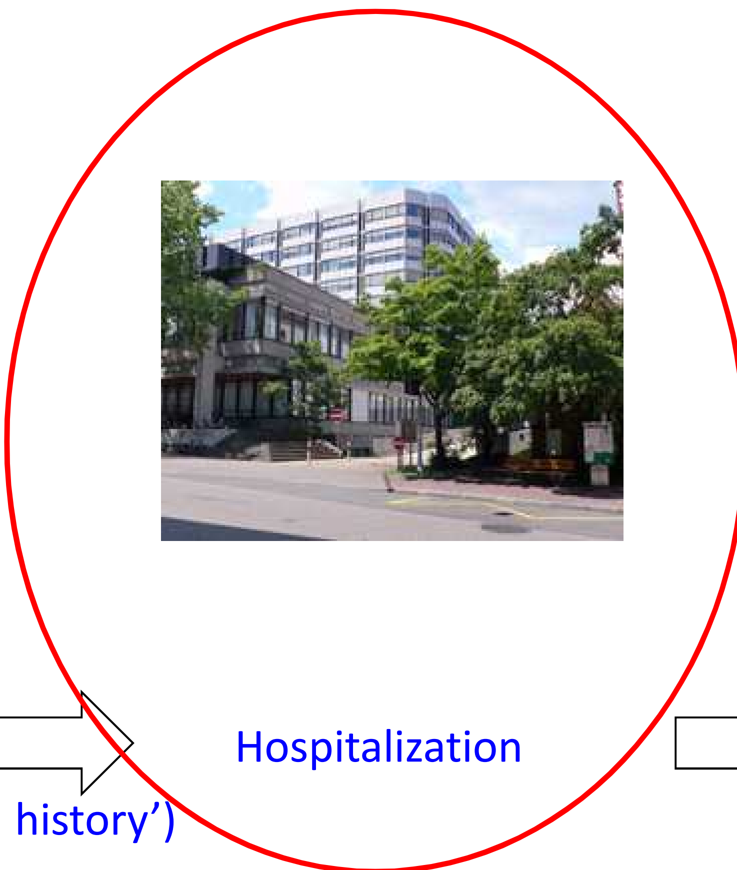


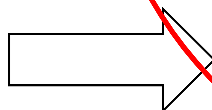
Medication management



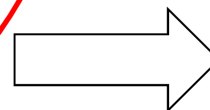
Hospitalization







Hospitalization



Discharge

BPMH
('best possible medication history')

Medication process during hospitalization

Prescribing

67% lack of dose adaption in renal failure patients
2,5% overdosing
6,7% prescribing errors

Monitoring

50% TDM mistakes

Transferring data

17% data transfer mistakes

Preparation

43% handling mistakes
5,8% incompatibility of i.v. drugs

Dispensing / intake

20% unknown co-medication
6,4% non-adherence
6% St.Johns wort (IA!)

Schweiz.Med Rundschau Praxis 1993, Anaesthesia 2004, BJCP 2004;EJCP 2007 (adapted from W.E. Haefeli)

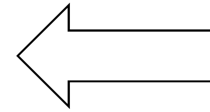
An important principle of drug safety…

The 5 - R - Rule

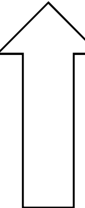
- the right drug
- for the right patient
- in the right dosage
- in the right way of application
- at the right time

…regardless of where the patient is (hospital or ambulatory setting)!

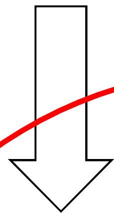
aerztezeitung.de



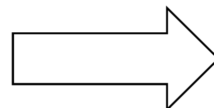
Medication management



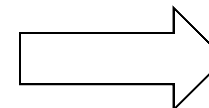
Hospitalization



?



Hospitalization



Discharge

BPMH
('best possible medication history')

Best possible medication history

Information sources:

At least two!

- Written sources
- Patient-/ relatives: interview
- Medicaments in the bag
- Telephone information sources

Personal "Anamnese"

- Allergies
- Adherence
- Medical aids
- Who is managing the medication
- GP and community pharmacy

Medicaments:

All that are currently in use!

- Rx
- OTC
- Herbal drugs, homeopathy etc.
- Nutrition additives
- Ad hoc medication (e.g. analgesics, antihistamines, PPIs etc.)
- Drugs from other people?
- Inhaled drugs
- Injections
- Contraception / HRT
- Topical products: dermatology, eye drops, nose sprays

Medicament intake

- Product names
- Strength
- Frequency
- Galenic formulation
- Intake mode
- Treatment duration
- Recent changes

Documentation & Communication

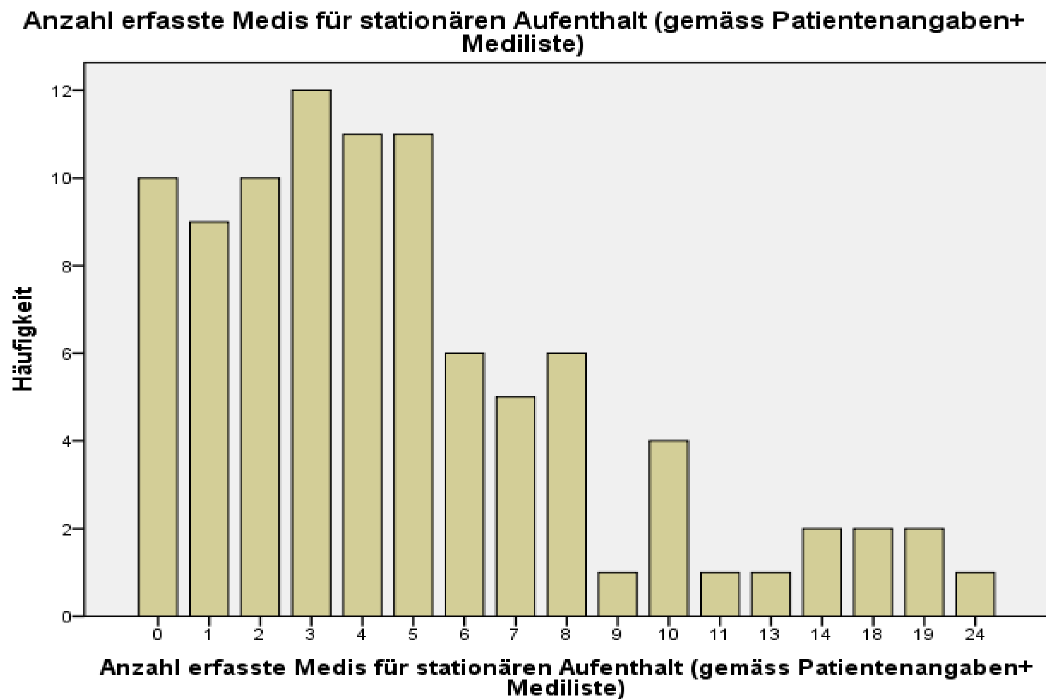
Store centrally and electronically

Stiftung Patientensicherheit Schweiz. Der systematische Medikationsabgleich im Akutspital. Empfehlungen im Rahmen des nationalen Pilotprogramms progress! Sichere Medikation an Schnittstellen. 2015. Available from: http://www.patientensicherheit.ch/de/publikationen/Infomaterial-Schriften-B-cher.html

BPMH (‘Best Possible Medication History)

Urology/Surgery Unit

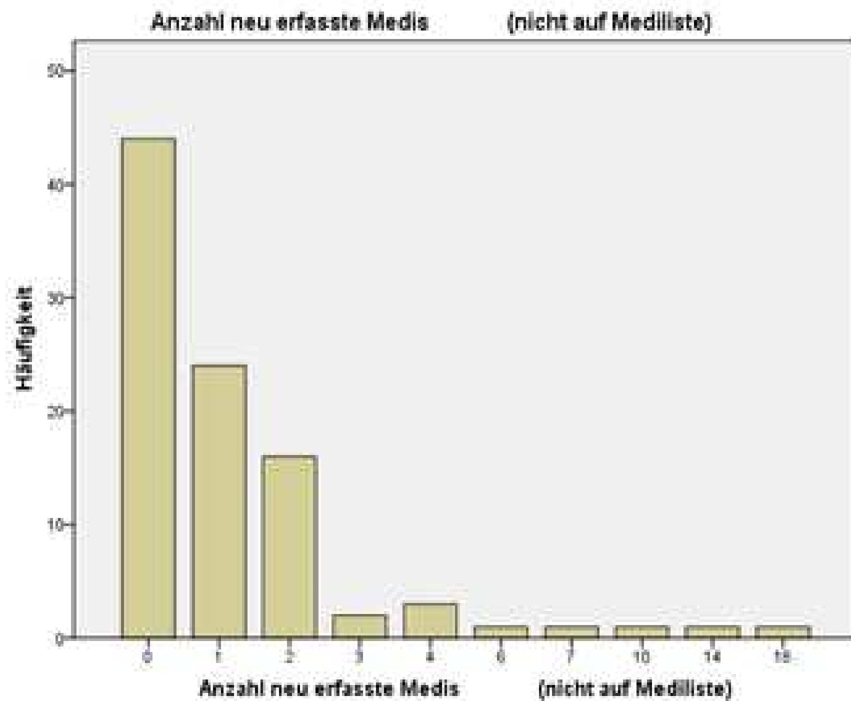
- BPMH done by clinical pharmacists (Nov/Dec 2016, n=88)
- BPMH = ‘best possible medication history’ = interview of the patient plus ‘second opinion’ by the GP / pharmacy / relatives

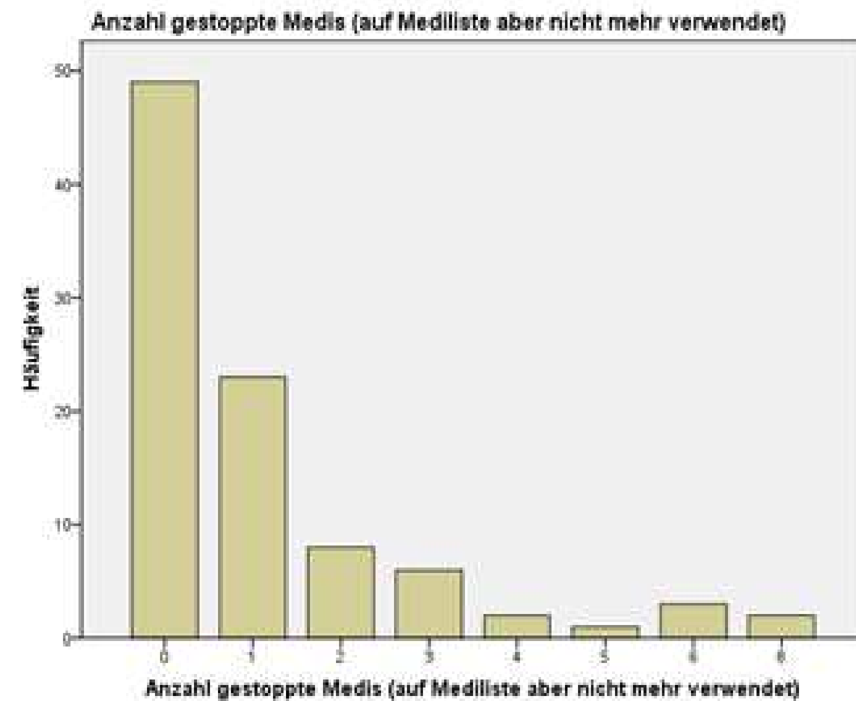


BPMH (‘Best Possible Medication History)

Urology/Surgery Unit

- In 55% of all patients, additional drugs were identified
- For 140 of the 482 recorded drugs, a better-suited alternative could be proposed by the clinical pharmacists





BPMH (‘Best Possible Medication History)

Urology/Surgery Unit

- The initially recorded medication list was correct in 13 of 88 patients (14.8%) (4 patients (4.5%) did not take any drugs at all)

Total number of recorded drugs	**482**
Total number of correctly recorded drugs	69
Total number of newly identified drugs after BPMH	129
Total number of therapy stops after BPMH	106
Total number of changes of drug or dosage	99

- In addition, the clinical pharmacists detected drug-related problems for 29 of 88 patients (33%) which were brought to the attention of the doctor

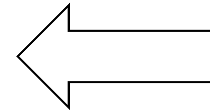
As a consequence, other surgical wards, the emergency department and the internal medicine would like to adopt this activity.

BPMH (‘Best Possible Medication History)

Extension of this service to additional units?

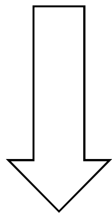
- Pilot study on internal medicine wards: can technicians or nurses be trained to take a BPMH in the absence of pharmacists?
- In how many instances does the clinical pharmacist not only take the BMPH, but also detects important drug-related problems?
- If the BPMH defers from the standard ‘Anamnese’: how pharmacologically relevant are these deviations potentially?
- How could we expand the service to the whole hospital without hiring another 100 pharmacists?
- What role does the electronic prescribing play, and what electronic triggers may pop up as markers for potentially drug-related problems and vulnerable patients?

aerztezeitung.de

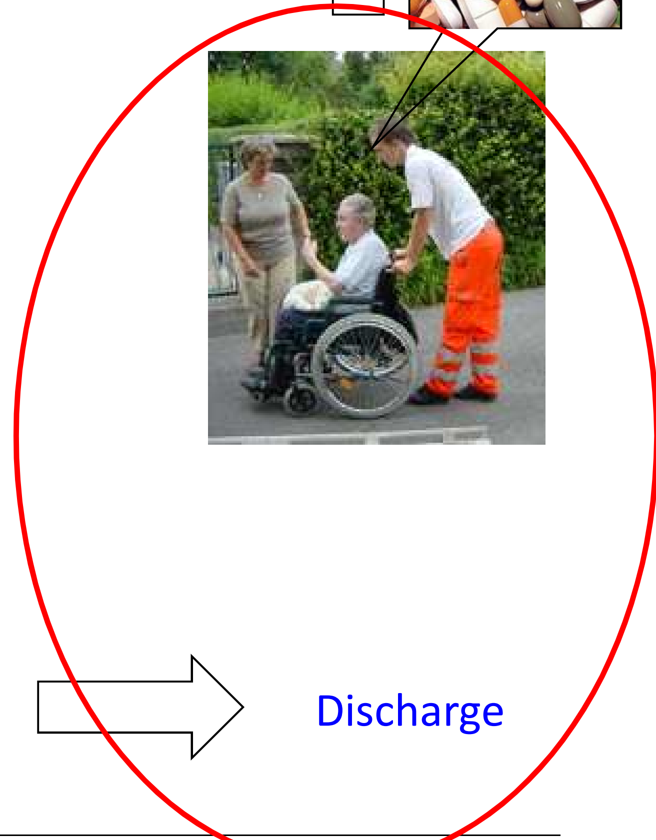


Medication management

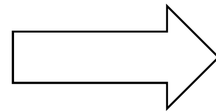
Hospitalization



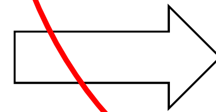
?



BPMH
('best possible medication history')



Hospitalization



Discharge

UNI BASEL

OPTIMIZING MEDICATION SAFETY DURING TRANSITION OF CARE FROM HOSPITAL TO HOME CARE

Dr. Carla Meyer-Massetti[1,2], Vera Hofstetter BSc[1,3], Barbara Hedinger[4], Prof. Dr. Christoph R. Meier[1,2]

[1]Clinical Pharmacy& Epidemiology, Department of Pharmaceutical Sciences, University of Basel, Switzerland
[2]Center for Hospital Pharmacy, University Hospital of Basel, Switzerland
[3]Center for Hospital Pharmacy, Cantonal Hospital of Lucerne, Switzerland
[4]Quality Management, Spitex Stadt Luzern, Lucerne, Switzerland

Correspondence: Dr. phil.II Carla Meyer-Massetti, MSc pharm / FPH, e-mail: carla.meyer@unibas.ch

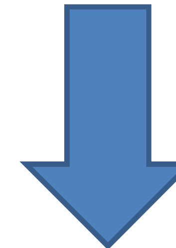
SPITEX
Hilfe und Pflege zu Hause
STADT LUZERN

luzerner kantonsspital
LUZERN SURSEE WOLHUSEN

BACKGROUND

The current literature indicates that up to 54% of patients are affected by medication errors during transition from hospital to ambulatory care.[1]
The transfer process is complex, involving different providers and therefore fraught with communication-related challenges.[2]
While patients 65 years and older are specifically at risk of experiencing drug related problems[3], little is known about medication safety during transition of care to the home care setting of this specific patient population.

luzerner kantonsspital
LUZERN SURSEE WOLHUSEN



SPITEX
Hilfe und Pflege zu Hause
STADT LUZERN

Master thesis

6 weeks

N=39 total

N=19 had 5+drugs

UNI BASEL

Universitätsspital Basel

Table 1: Potential drug related problems in the study population (n=19)

Drug-related Problem	Number of patients affected
Drug name / substance name – missing or wrong information	10 (52.6%)
Single dose – missing or wrong information	16 (84.2%)
Dosing interval / frequency – missing or wrong information	15 (79.0%)
Dosage form (e.g. tablet, capsule) – missing or wrong information	16 (84.2%)
Indication not treated	10 (52.6%)
Contraindication	4 (21.1%)
Duplication	1 (5.3%)
Drug therapy without evident indication	13 (68.4%)
Interaction	14 (73.7%)
Documentation error by home care organization	5 (26.3%)
Potentially inappropriate medication (Priscus, START/STOPP)	9 (47.4%)

Patient education at hospital discharge

- All patients who received a kidney transplant get advice and teaching by clinical pharmacists before discharge
- Reduction of application errors and of drug-related problems
- Explanation of ‘why’ and ‘what for’, to improve adherence!
- Contacting the community pharmacy, if needed, to facilitate the transfer of a patient from hospital to home
- Additional explanations (risk of infections due to immunosuppression, need for consequent sun protection…).

Donnerstag, 1. Juni 2017

Bern, Welle7

patientensicherheit schweiz
sécurité des patients suisse
sicurezza dei pazienti svizzera
patient safety switzerland

Sicheres Medikationsmanagement an den Übergängen der stationären Versorgung

Sichere Medikation. Abgleich mit System!
Sécurité de la médication. Vérification systématique!
Farmacoterapia sicura. Verifica sistematica!

«Seamless care»

patientensicherheit schweiz
sécurité des patients suisse
sicurezza dei pazienti svizzera
patient safety switzerland

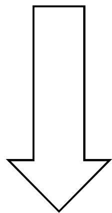
Versorgung

Sichere Medikation. Abgleich mit System!
Sécurité de la médication. Vérification systématique!
Farmacoterapia sicura. Verifica sistematica!

aerztezeitung.de

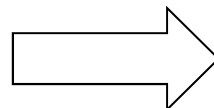
Medication management

Hospitalization

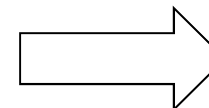


?

BPMH
('best possible medication history')



Hospitalization



Discharge

Medication management via “Polymedikations-Check” (since 2010)

- Detailed and structured medication reconciliation with written or e-protocol
- Patient / relatives bring all drugs to the pharmacy: pharmacists reviews and discusses these therapies and contacts the doctor, if necessary
- Pharmacist suggests to add drugs or to stop therapies
- Pharmacist identifies and solves drug-related problems
- PMC improves adherence! Definition of therapy goals: are they achieved?
- Consult on adverse effects, drug interactions and more

Approx. 50 CHF, paid by health insurance

No prescription by a doctor required; agreement between pharmacist and patient!

Max. 2 times per year, if patient takes ≥ 4 different drugs during ≥ 3 months

Review

Open Access Research

BMJ Open Effectiveness of pharmacist-led medication reconciliation programmes on clinical outcomes at hospital transitions: a systematic review and meta-analysis

Alemayehu B Mekonnen,[1,2] Andrew J McLachlan,[1,3] Jo-anne E Brien[1,4]

Parameter	Risk ratio (95% CI)
All cause readmission	0.81 (0.70-0.95)
All cause emergency department visits	0.72 (0.57-0.92)
Adverse drug event-related readmissions	0.33 (0.20-0.53)
All cause mortality	1.05 (0.95-1.16)

Mekonnen et al, BMJ Open, 2016

Clinical Pharmacy: the patient in the center

Clinical Pharmacist

Patient

Nursing

Doctor

Application

Preparation

Education

Correct labelling

Stock optimization on the ward

Advice upon discharge

Teaching of drug use

Ward rounds

Check new therapies

Assist with new drugs

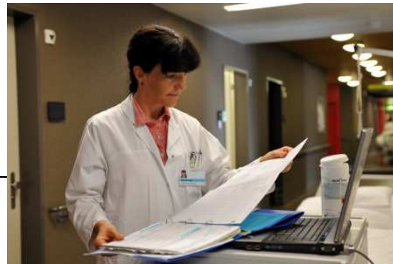
Education

Guidelines

Hospital formulary

Compatibility/ DD-IA

Optimal therapy



Medizinalberufegesetz (MedBG) 2016

Artikel 9

- **Artikel 9 Bst. c, f, h, i, j**

Absolventinnen und Absolventen des Studiums der Pharmazie:

c. haben umfassende Kenntnisse über den **Einsatz**, die **Wirkung**, die **Anwendung** und die **Risiken** von Arzneimitteln und von für ihren Beruf wichtigen Medizinprodukten;

f. übernehmen Aufgaben zur Förderung und Erhaltung der Gesundheit sowie zur **Verhütung von Krankheiten** und erwerben die entsprechenden Kompetenzen, insbesondere bei **Impfungen**;

h. sind **mit den Aufgaben der verschiedenen Fachpersonen in der medizinischen Grundversorgung vertraut**;

i. kennen und verstehen namentlich die Prinzipien und die fachlichen Grundlagen für die Herstellung, die Abgabe, den Vertrieb, die Dokumentation und die Entsorgung **komplementärmedizinischer Arzneimittel** und deren rechtliche Vorschriften;

j. haben **angemessene Grundkenntnisse** über **Diagnose und Behandlung häufiger Gesundheitsstörungen und Krankheiten**.

Medizinalberufegesetz (MedBG) 2016

Artikel 9

- **Artikel 9 Bst. c, f, h, i, j**

  Absolventinnen und Absolventen des Studiums der Pharmazie:

  c. haben umfassende Kenntnisse über den **Einsatz**, die **Wirkung**, die **Anwendung** und die **Risiken** von Arzneimitteln und von für ihren Beruf wichtigen Medizinprodukten;

  f. übernehmen Aufgaben zur Förderung und Erhaltung der Gesundheit sowie zur **Verhütung von Krankheiten** und erwerben die entsprechenden Kompetenzen, insbesondere bei **Impfungen**;

  h. sind **mit den Aufgaben der verschiedenen Fachpersonen in der medizinischen Grundversorgung vertraut**;

  i. kennen und verstehen namentlich die Prinzipien und die fachlichen Grundlagen für die Herstellung, die Abgabe, den Vertrieb, die Dokumentation und die Entsorgung **komplementärmedizinischer Arzneimittel** und deren rechtliche Vorschriften;

  j. haben **angemessene Grundkenntnisse** über **Diagnose und Behandlung häufiger Gesundheitsstörungen und Krankheiten**.

Medizinalberufegesetz (MedBG)

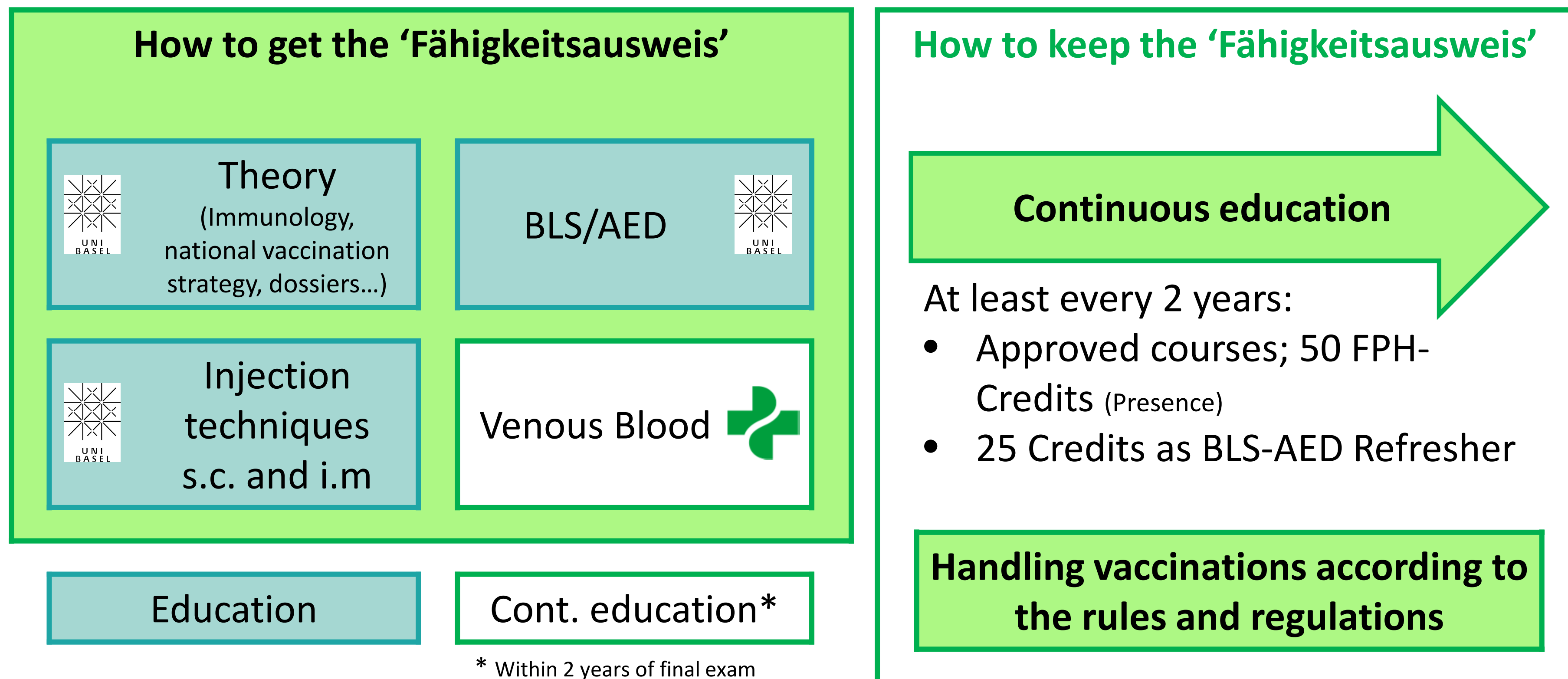
Artikel 9: Impfen

Why is vaccinating important for pharmacists?

- Prevention of infections / public health!
- Promote influenza vaccinations: no waiting time, cheap, and easy access.
- More and more drugs have to applied via parenteral route (s.c., i.m., i.v.).
- But: childhood vaccination programs will still be managed by pediatricians!

How to get to the «Fähigkeitsausweis Impfen»?

- Since 2016 pharmacy students at the University of Basel do achieve 3 of 4 parts of this education at a seminar in Davos (in combination with the national congress ***pharmaDavos***)



Medizinalberufegesetz (MedBG) 2016

Artikel 9

- **Artikel 9 Bst. c, f, h, i, j**

Absolventinnen und Absolventen des Studiums der Pharmazie:

c. haben umfassende Kenntnisse über den **Einsatz**, die **Wirkung**, die **Anwendung** und die **Risiken** von Arzneimitteln und von für ihren Beruf wichtigen Medizinprodukten;

f. übernehmen Aufgaben zur Förderung und Erhaltung der Gesundheit sowie zur **Verhütung von Krankheiten** und erwerben die entsprechenden Kompetenzen, insbesondere bei **Impfungen**;

h. sind **mit den Aufgaben der verschiedenen Fachpersonen in der medizinischen Grundversorgung vertraut**;

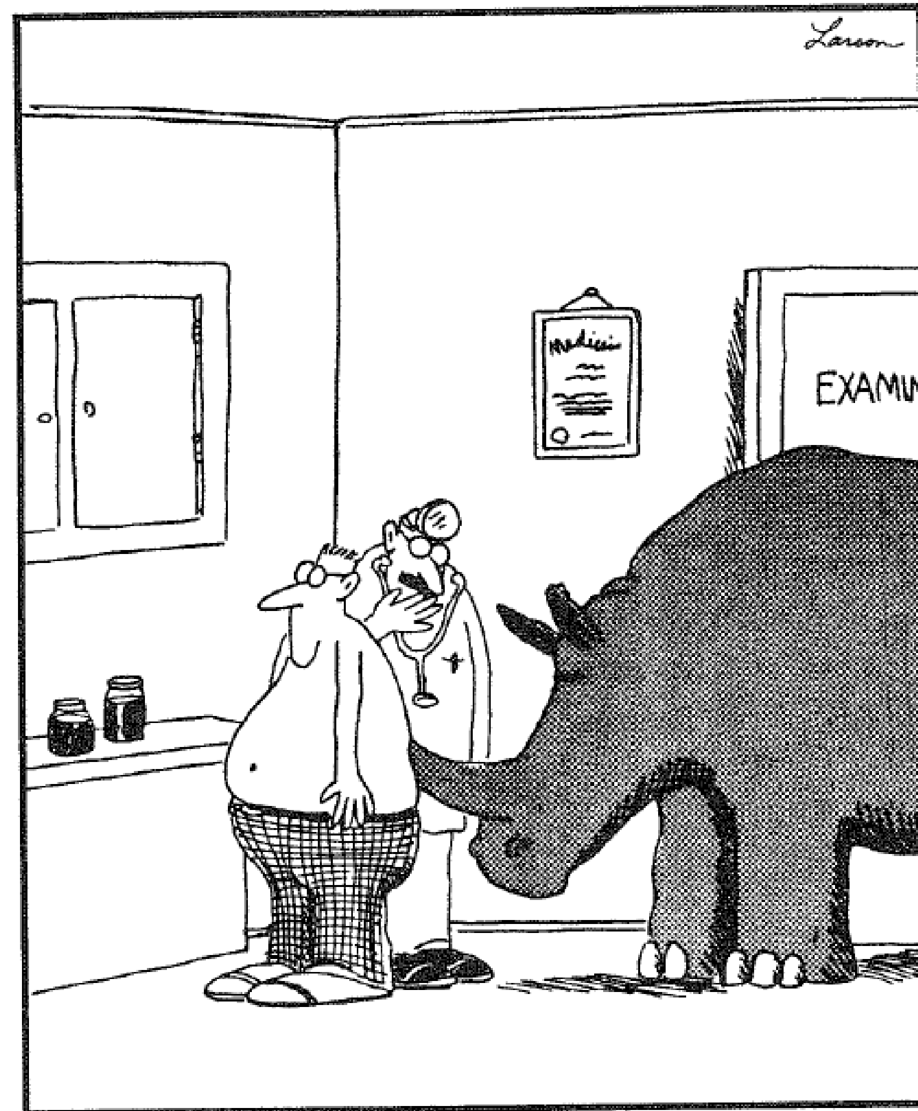
i. kennen und verstehen namentlich die Prinzipien und die fachlichen Grundlagen für die Herstellung, die Abgabe, den Vertrieb, die Dokumentation und die Entsorgung **komplementärmedizinischer Arzneimittel** und deren rechtliche Vorschriften;

j. haben **angemessene Grundkenntnisse** über **Diagnose und Behandlung häufiger Gesundheitsstörungen und Krank-heiten.**

Be aware: **DIAGNOSIS** is a big term…!

What is often a challenge for highly trained and skilled medical doctors cannot and will not be taken over by pharmacists!

But…



"Wait a minute here, Mr. Crumbley. … Maybe it isn't kidney stones after all."

Medizinalberufegesetz (MedBG)

Artikel 9 - Grundkenntnisse über **Diagnose** und Behandlung…

… there are many complaints and clinical situations, in which we can talk about a 'diagnosis', even in the pharmacy!

- Hay fever, allergic rhinitis, conjunctivitis…
- Influenza
- Sleep problems, migraine, diarrhea, constipation…
- Athlete's foot

Screening and early detection:

- Hypertonia
- Dyslipidemia
- Diabetes mellitus
- others

However: a firm diagnosis and the identification of an etiology is the job of the doctor!

Master courses in Pharmacy / University of Basel

MSc Pharmazie

Masterstudium **Pharmazie** (120 ECTS)

Exam „Eidg. dipl. ApothekerIn“

Master thesis

„Blockkurse“ UNI
&
Assistenzzeit (Offizin/Spital)

Basics Clinical Pharmacy and Pharmacotherapy

MSc Drug Sciences

Masterstudiengang **Drug Sciences** (120 ECTS)

Master thesis (2 semesters)

Drug Sciences (2 semesters)

Bachelor in Pharmaceutical Sciences

Other Bachelors possible

Postgraduate education in Clinical Pharmacy

Title	Duration	Course days / year	Course days total
DAS Hospital Pharmacy	3 Years	14	42
CAS Clinical Pharmacy	1,5 Years	14	21

- Often in combination with an “Ausbildungsstelle” in a hospital
- Can be done as full package with certificate / diploma, or just as individual course days for continuous education
- Includes a 2-week ‘Praktikum’ in a teaching hospital
- Theoretical framework to achieve a FPH Spitalpharmazie or Klinische Pharmazie
- Reasonably low course fees thanks to industry sponsoring
- Open to all community pharmacists! New course 50 people, 2/3 community!

CAS *Clinical Pharmacy* is an integrated part of the DAS *Hospital Pharmacy*

Concept DAS / CAS:

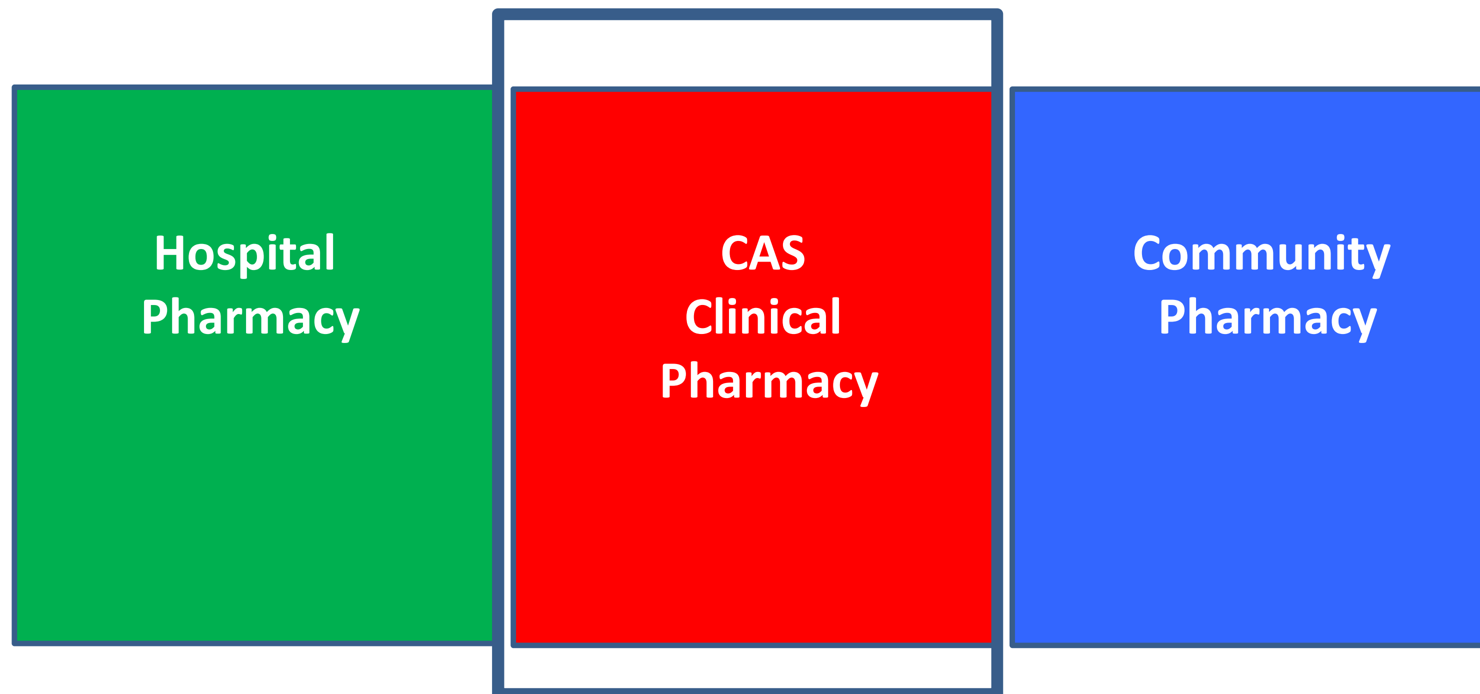
- 21 course days with class work, workshops and tutorials form the CAS and are part of the DAS *Hospital Pharmacy*
- 10 colloquia in Clinical Pharmacy with detailed discussion of cases, special situations and guidelines

Sub-specialization to a “CAS Clinical Pharmacy for community pharmacy”?

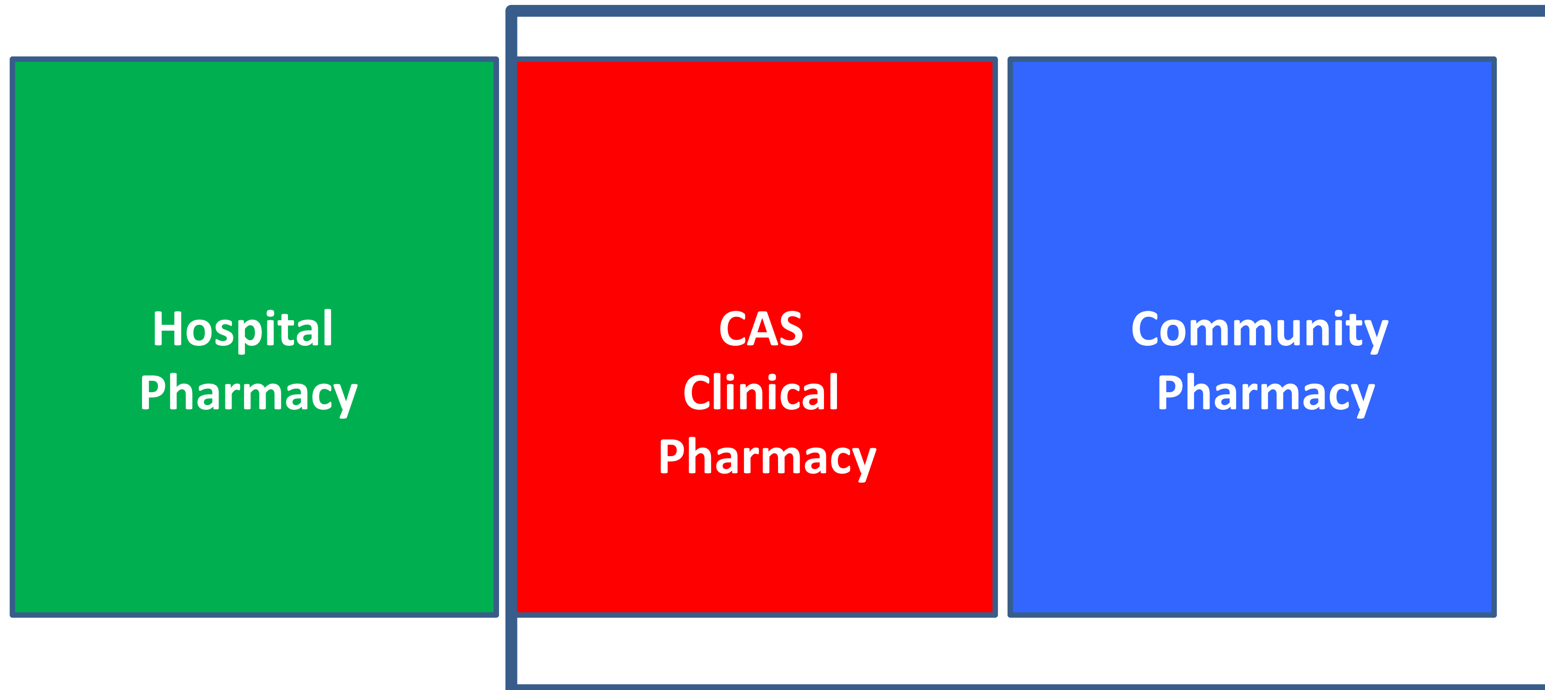
- Seamless care / patient transfer across institutions
- Interprofessional collaboration with ‘Spitex’, homes, institutions…
- Polymedikationscheck (PMC)
- eHealth
- Motivational Interviewing and improvement of adherence
- Information retrieval
- Economic aspects of pharmacy services
- Training classes e.g. for NetCare (telemedicine, guidelines, algorithms)

Will the CAS *Clinical Pharmacy* also be an integrated part of a future DAS *Community Pharmacy*, leading to the title *FPH Offizin?*

Will the CAS *Clinical Pharmacy* also be an integrated part of a future DAS *Community Pharmacy*, leading to the title *FPH Offizin?*



3-year curriculum;
in place since 2016


DAS Community Pharmacy
Hospital Pharmacy
CAS Clinical Pharmacy
Community Pharmacy
3-year curriculum?
not yet in place

Summary and outlook

- Community pharmacy = clinical pharmacy
- The education and the postgraduate education of community pharmacists will and must move towards clinical pharmacy
- The performance of community pharmacists improves substantially with the acquisition of skills in clinical pharmacy, in medication management, in the interprofessional collaboration, as well as in the "OTC-setting"
- "Medication manager" as opposed to pure "medication dealer and seller"
- New reimbursement models are required and have been launched in CH
- Class work is important, but practical work on the ward is crucial
- How can we offer "Praktika" of substantial duration (at least 2 months) to all pharmacists? The current 2 weeks are a good starting point, but not enough!

Thank you!