The German National Medication Plan –
A Tool to Improve Medication Safety

Prof. Martin Schulz, PhD, FFIP, FESCP

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N = 14,000

Estimated number of prescribed doses to every person in Britain over their lifetime.

Interpretation: Appr. 7.7 years polypharmacy (defined as ≥ 5 medicines per day)

+ OTC !
Challenges Medication Safety (Data 2015)

Results:
- 5% hospitalisations by ADE/ADR
- at least 25% avoidable
In Germany:
- 250,000 hospitalizations by avoidable medication errors (ME)
- Costs:
  - >1bn €

Patient:
- Adherence 50%
- 72% w/o yearly med safety check
- >37% OTC

Non-adherence
50% of chronic Rx

879M Rx

8M prescribing errors (1%)

8M prescribing errors (1%)

(Self-) Diagnosis

• 44.6bn € drug turnover pharmacies
• Potential savings:
  - > 1bn € avoidable ADR/ME
  - > 10bn € non-adherence

Dispensing

• 14M prescribing/counselling errors (1%)
  - In 94% of med safety checks need for modifications

Non-adherence
50% of chronic Rx

+ OTC = 526M packs

>37% OTC
# Polymedication in patients 65+

## AOK Northeast, 1–6/2015 in %

<table>
<thead>
<tr>
<th></th>
<th>5 – 9</th>
<th>10+ medicines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berlin</td>
<td>61.1</td>
<td>18.0</td>
</tr>
<tr>
<td>Brandenburg</td>
<td>64.3</td>
<td>18.9</td>
</tr>
<tr>
<td>Mecklenburg-Vorpommern</td>
<td>68.0</td>
<td>22.6</td>
</tr>
</tbody>
</table>

Source: AOK Forum Issue 3 – 2015, p. 5
At first: let‘s read the package inserts of my 12 medicines ...
... or develop my medication schedule ...

Freigofas J et al.
e-Health 2014 – Special edition
treatment/safety
A medication list has been identified as a relevant patient safety indicator.\(^1\)

The **Medication Plan (MP)** may be seen as a combination of a medication list and the information on a personalized prescription drug label.

- Highly relevant for patient safety,
- and one out of 14 identified significant patient safety indicators for Germany.\(^2\)


Definition

„The MP is a printable document for the patient. It specifies the complete medication (Rx, self medication) […] The MP facilitates the correct administration of the medication after patient counseling in the pharmacy."

› Overview of the complete medication.
› Specifies the active ingredient, form, dosage and unit of each drug.
› Includes administering information and the medical indication.
› The Medication Plan (MP) may be seen as a combination of a medication list and the information on a personalized prescription drug label.

Evolution

„Action Plans for Medication Safety“
Issued by the Federal Ministry of Health

» 2008/2009
  › Identification of patient safety indicators suitable for Germany
    → medication list 1 of 14 relevant safety measures

» 2010-2012
  › Development of a template for a standardized medication plan (form).
  › Workshops with representatives from all parts of the health care system.
  › Development of a specification for an (electronic) medication plan.
Completeness of data?

A ≠ B ≠ C ≠ true medication

Discrepancies between different information sources (physician, pharmacy, patient) are rather the rule than the exception:¹⁻¹¹

- In 7 – 24% only no discrepancies.
- Most frequent deviation: Patient takes an additional unknown/not documented product.
- Predictors are age, number of medicines and prescribers.
- Main reasons at GP: organization, documentation, self-medication/OTC-use, Rx by specialists.

German National Medication Plan

» Defined form and content → standardization

» Nationwide implementation

» In pharmacies’ and physicians’ software

» 2D Barcode

<table>
<thead>
<tr>
<th>Active ingredient</th>
<th>Brand name</th>
<th>Strength</th>
<th>Form</th>
<th>Effective daily dose</th>
<th>Unit</th>
<th>Instructions</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium oxide</td>
<td>Magnesium-Diasporal® 150</td>
<td>250mg</td>
<td>Caps</td>
<td>0 0 1</td>
<td>Pcs</td>
<td></td>
<td>Cramps</td>
</tr>
<tr>
<td>Metoprolol succinate</td>
<td>Metoprolol succinate - 1A Pharma®</td>
<td>95mg</td>
<td>Tabl</td>
<td>½ 0 0</td>
<td>Pcs</td>
<td></td>
<td>Heart failure</td>
</tr>
<tr>
<td>Omeprazole</td>
<td>Antra MUPS® 20mg</td>
<td>20mg</td>
<td>Tabl</td>
<td>1 0 1</td>
<td>Pcs</td>
<td></td>
<td>Heart burn</td>
</tr>
<tr>
<td>Methotrexate</td>
<td>MTX HEXAL® 10mg</td>
<td>10mg</td>
<td>Tabl</td>
<td>once a week Monday</td>
<td>Pcs</td>
<td>At night with a glass of water</td>
<td>Joint inflammation</td>
</tr>
<tr>
<td>Metamizole (dipyrone)</td>
<td>Novaminsulfin 5/90 mg</td>
<td>500mg/ml</td>
<td>Drops</td>
<td>30 30 0 30</td>
<td>Drops</td>
<td></td>
<td>Pain</td>
</tr>
<tr>
<td>Combination product</td>
<td>Baldipram® zur Beruhigung</td>
<td>Tabl</td>
<td></td>
<td>1 1 1 1</td>
<td>Pcs</td>
<td></td>
<td>Restlessness</td>
</tr>
</tbody>
</table>
Insured persons who simultaneously use at least 3 prescribed medicines (for at least 28 days), are entitled to receive a medication plan (in paper, later-on electronically) by their general practitioners as of 1 October 2016.
Medication Plan

» Aim: overview of the complete medication

» Benefit:

Patient: minimizing confusion and misunderstandings, promoting medication adherence [1].


Medication safety

Requirements: up-to-date, complete and comprehensible!

But, do patients understand the standardized MP?

» Studies: evaluating patients' comprehensibility
  › N=40 general internal medicine patients (GIM)
  › N=50 patients with chronic heart failure (CHF)
  › N=50 patients with diabetes mellitus type 2 (DMT2)

» Structured face-to-face interviews

» Mock-up medication plan (6 medicines)

» Practical approach
  › Filling of pill-boxes according to the given dosing regimen
  › Photo documentation

» Quantified by ET-MP score (0–100%; cutoff: >90%)

## Mock-up medication plan

**medication plan**

**for: Michaela Mustermann**

**issues by:**
Dr. Helga Herz  
Hauptstraße 55, 01234 Am Ort  
Tel.: 04562-12345  
E-Mail: h.herz@mein-netz.de

**born: 13.12.1936**

**issue date: 24.09.2015**

| Active ingredient       | Brand name                          | Strength | Form | morning | noon | evening | bedtime | Unit |
|-------------------------|-------------------------------------|----------|------|---------|------|---------|---------|------|-------|
| Magnesium oxide         | Magnesium-Diasporal® 150             | 250mg    | Caps | 0       | 0    | 1       |         | Pcs  |
| Metoprolol succinate    | Metoprololsuccinat - 1A Pharma®     | 95mg     | Tabl | ½       | 0    | 0       |         | Pcs  |
| Omeprazole              | Antra MUPS® 20mg                    | 20mg     | Tabl | 1       | 0    | 0       | 1       | Pcs  |
| Methotrexate            | MTX HEXAL® 10mg                     | 10mg     | Tabl | once a week Monday | | | | Pcs  |
| Metamizole (dipyrone)   | Novaminsulfon 500 mg Lichtenstein    | 500mg/ml | Drops | 30    | 30  | 0  | 30  | Drops |
| Combination product     | Baldriparan® zur Beruhigung         |          | Tabl | 1 1 1 1 | 1  | | | Pcs  |

**Indication**
- Cramps
- Heart failure
- Heart burn
- Joint inflammation
- Pain
- Restlessness
Rating: correct

ET-MP Score: 100%
Rating: incorrect

ET-MP Score: 32%

Monday

Tuesday
Do patients (N=140) understand the standardized MP?

ET-MP Score >90%: 37%

- GIM = general internal med (n=40)
- CHF = chronic heart failure (n=50)
- DMT2 = Diabetes mellitus Type 2 (n=50)

Medication management

- Initial medication review followed by long-term monitoring
- Avoiding ADE and promoting medication adherence

Medication catalogue

- Facilitating drug selection process for common indications
- Based on guidelines
- 3 drug categories: „standard“ (first line), „reserve“ and „subordinate“

Preferred generic prescribing

- Prescribing of active ingredients (INN) instead of brand products
First contract based on the „ABDA-KBV/Concept“
Signed in 2014 for an initial period of 5 years.

ARzneiMittelINitiative Sachsen-Thueringen Partners:

- Associations of pharmacists and physicians in Saxony and Thuringia.
- AOK PLUS (a large statutory health insurance company; coverage approximately 50% of the population).
Participating pharmacies and GPs in ARMIN (01/17): 1,527 HCPs

» Pharmacies: 984
  › Saxony: 509
  › Thuringia: 475

» Physicians: 543
  › Saxony: 237
  › Thuringia: 306
4 Data sources in ARMIN

- Patient
- Physician
- Pharmacy
- Health insurance
Medication Plan Exchange Server in ARMIN

MP-Server

Technical functions:
Initial version
Display
Amendments
Medication safety check
Modifications
Deletion
Print

AVS
Technical functions in local software

PVS
Technical functions in local software

Conventions:
Download before tech. functions
Temporary blocking
Upload after amendment
Upload always complete

Download and Upload:
• VPN-Tunnel via KV SafeNet
• Asymmetric encryption
• Transfer via HTTPS

www.arzneimittlinitiative.de
Aim:

- An up-to-date, comprehensive Medication Plan: complete, checked for potential medication safety risks, consolidated between HCPs (and the patient), developed and continuously updated electronically!

www.arzneimittelininitiative.de
... I’m already shut!
Why is a MP important?

» Discrepancies – rather the rule than the exception –
  › between physicians‘ and pharmacists‘ documentation and the medication the patient is actually taking
  › Only in 7-24% of the cases no discrepancies

» Patient knowledge
  › Patient tend to forget or
  › misunderstand given information
  › Written instructions can help (➔ if easy to understand/easy language)

» Threat for medication safety
  › Ignorance of the complete medication can cause drug-related problems
    • i.e. double medications or
    • Interactions or
    • medication non-adherence
Data exchange in *ARMIN*

- Lists of eligible patients
- Prescription data of registered patients
- No access to read

Network operated by the associations of physicians ("KV SafeNet")

- Up- and download of MPs
- Download:
  - Patient lists
  - Prescription data (only for patients that signed up for respective pharmacy / general practice)