Critical Success Factors for Medication Safety

Daniel Grandt, MD

Drug Commission of the German Medical Association (AkdÄ)
Conflict of interest

• Physician, Head of Department of Internal Medicine I, Klinikum Saarbrücken

• Member of
  • Medical Societies (DGIM und DGVES)
  • Board of Directors of the Drug Commission of the German Medical Association (AkdÄ)
  • Steering Group for the Roadmap to medication Safety, German Ministry of Health
  • WHO Expert Group Research on Patient Safety
  • International Medication Safety Network (IMSN)

• Founding member and former CEO German Coalition on Patient Safety

• Reviewer / Scientific Adviser
  • WHO
  • German Israeli Foundation for Scientific Research and Development
  • Medical Journaly
  • Friedrich-Ebert-Stiftung
  • RpDoc® Solutions GmbH, Saarbrücken

• Medication Safety projects funded by
  • BARMER-GEK
  • Knappschaft Bahn See
  • German Federal Ministry of Health
Prevalence of Adverse Drug Events on Hospital Admission

71% of these side-effects would have been preventable

2 of 3 of patients suffer from side-effects of prescribed drugs at the time of hospital admission

200 patients studied
Prescribing errors are the most relevant cause of preventable ADE

### Causes and types of Medication Errors

**Table 2. Causes and types of errors of commission and omission**

<table>
<thead>
<tr>
<th>Errors of commission</th>
<th>Errors of omission</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health system level</strong></td>
<td><strong>Provider level</strong></td>
</tr>
<tr>
<td>Necessary information for safe use of drug lacking</td>
<td>Physicians</td>
</tr>
<tr>
<td>Substandard drug</td>
<td>Inadequate prescription</td>
</tr>
<tr>
<td>Counterfeit drug</td>
<td>Lack of knowledge about drug</td>
</tr>
<tr>
<td>Error-prone conditions</td>
<td>Lack of information on patient</td>
</tr>
<tr>
<td>Look-alike medication</td>
<td>Lack of medical knowledge</td>
</tr>
<tr>
<td>Sound-alike medication</td>
<td>Failure to apply medical knowledge</td>
</tr>
<tr>
<td>Process organization and resources</td>
<td>Failure of follow-up</td>
</tr>
<tr>
<td>Drug not available</td>
<td>Failure to recognize drug side-effects</td>
</tr>
<tr>
<td>Drug too expensive be used</td>
<td>Other professionals</td>
</tr>
<tr>
<td></td>
<td>Failure to administer drug</td>
</tr>
<tr>
<td><strong>Patient level</strong></td>
<td></td>
</tr>
<tr>
<td>Intentional or unintentional lack of adherence</td>
<td>Intentional or unintentional lack of adherence</td>
</tr>
</tbody>
</table>
Medication Errors: Contributing factors

1. Missing information on the patient
Necessary information on drug therapy is often not available when needed for safe prescribing.

20% of patients ≥ 65 yr. on ≥ 8 drugs know their drugs and dosing.

Medication Errors: Contributing factors

1. Missing information on the patient

2. Inadequate prescribing decisions
   - Wrong drug / dose for disease / patient
   - Dangerous drug – drug combination
   - Failure to monitor and adjust / discontinue therapy
Prescribing errors in outpatients studied on hospital admission

% of patients

- Overdosing: Admission 19, Discharge 14
- Overdosed for renal function: Admission 14, Discharge 14
- Drug interaction: Admission 23, Discharge 23
- PIM (PRISCUS): Admission 5, Discharge 5
- Not indicated: Admission 18, Discharge 18
- Contraindicated: Admission 28, Discharge 28
- Destroyed by splitting: Admission 6, Discharge 6

n=200 patients, tertiary care hospital, NRW
Even experienced physicians detect only half of the prescription errors without IT support.

GLASSMANN et al. Med Care 2002
Does experience make a difference?

EQUIP study In depth investigation into causes of prescribing errors in UK

Tim Dornan – Hope Hospital – University of Manchester - BMJ 2010

- 19 hospitals in England studies
- 7 „census“ days
- all prescriptions analyzed

Prescription errors in % of all prescriptions
„To err is human“
No positive effect of hospitalization on medication safety

% of patients

overdosed | overdose for renal function | drug interaction | PIM (PRISCUS) | not indicated | contraindicated | destroyed by splitting

Admission: 19 14 23 5 18 28 6
Discharge: 20 13 25 5 17 29 6

n=200 patients, tertiary care hospital, NRW

BMG Förderkennzeichen: 2509 ATS 0021
Medication Errors: Contributing factors

1. Missing information on the patient

2. Inadequate prescribing decisions

3. Drug treatment process not resilient, e.g.
   - failure of care coordination
   - monitoring failure
Failure of care coordination

New 2011 Survey Of Patients With Complex Care Needs In Eleven Countries Finds That Care Is Often Poorly Coordinated

TRANSITIONS: Gaps also emerged in all countries at the point of hospital discharge, with at least one in four patients indicating lack of follow-up instructions or arrangements or clear medication directions. US patients reported among the lowest rates of gaps in coordination of hospital discharge, perhaps because the system is more rationalized payer and policy focus surrounding low readmission rates.

Regarding communication between clinicians, French and German patients were the most likely to report that specialists and primary care physicians failed to share information with one another, and Germans were the most likely to say that providers failed to share important information.
2007

✓ 2nd German Congress on Medication Safety
✓ 1st Roadmap to Medication Safety for Germany

**GRAFIK**

*Effekte moderner Informationstechnologie auf den Prozess der Medikation im Krankenhaus*

Arzt

Arzneimittelverordnung

**Verordnungsfehler:**
39 % aller schwerwiegenden Medikationsfehler, mit CPOE 55 % Reduktion

Krankenhausapotheker

**Verteilungsfehler:**
11 % aller schwerwiegenden Medikationsfehler, mit Barcode-Scanning von Arzneien 67 % Reduktion

Übertragung der Verordnung

Übertragungsfehler:
12 % aller schwerwiegenden Medikationsfehler, mit eMAR 100 % Reduktion

Dokumentation der Arzneimittelgabe

Pflegepersonal

Arzneimittelgabe

Patient

**eMAR:** elektronisches Medikationsadministrationsprotokoll; **CPOE:** elektronisches Verordnungssystem
Why don´t we succeed in preventing medication errors although it is possible?

... determine the level of safety that can be achieved
Root-Causes of Medication Errors

1. Inadequate risk awareness
Inadequate Risk Awareness

Failure to adequately handle statistical risks

.. many are afraid of sharks
Root-Causes of Medication Errors

1. Inadequate risk awareness
2. Inadequate risk attitude
Inadequate Risk Attitude

Accepting risks that can be avoided

„The Physician is used to work with what he has got“
Care process design does not protect patients from preventable risks of drug therapy

1.013 Oncologists working in 9 German / Swiss hospitals have been interviewed:

- 53% were concerned about patient safety in their departments
- 43% reported that critical safety rules are not applied
Root-Causes of Medication Errors

1. Inadequate risk awareness
2. Inadequate risk attitude
3. Local rationality principle
Reason’s „Swiss Cheese Model“ of accident causation

.. does not answer the question why active failures happen: „bad apple“?
Local Rationality Principle
extend the Swiss Cheese Model by analysing the reason why „active failures“ occur

Sidney Dekker, Field Guide to Understanding „Human Error“

The physician has to align competing goals, of which medication safety is just one - often ranked after economic goals of the institution.
Root-Causes of Medication Errors

1. Inadequate risk awareness
2. Inadequate risk attitude
3. Local rationality principle
4. Authority-Responsibility Mismatch
Authority-Responsibility Mismatch

.. means that someone has formal responsibility for the outcome of his work, but does not have full authority over the actions and decisions that take him to that outcome.

Sidney Dekker, Field Guide to Understanding „Human Error“

Although the physician is responsible for the quality and safety of (drug) treatment he does not have the authority to control his working conditions, e.g. time he spends on a patient
Root-Causes of Medication Errors

1. Inadequate risk awareness
2. Inadequate risk attitude
3. Local Rationality Principle
4. Authority-Responsibility Mismatch
5. Medication Safety is not (yet) a priority
   • neither for physicians
   • nor for hospitals
   • and also not for politicians
Economic goals dominate over medication safety

<table>
<thead>
<tr>
<th>What we know</th>
<th>What we do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error rate increases if a physician is interrupted while caring for a patient</td>
<td>Physicians are interrupted up to 9 times while taking an admission interview (hospital, Denmark)</td>
</tr>
<tr>
<td>High bed occupancy rates were associated with a significant 9 percent increase in rates of in-hospital mortality and thirty-day mortality, compared to low bed occupancy rates.</td>
<td>High bed occupancy rates are considered an indicator of high productivity for hospitals and a strategic goal.</td>
</tr>
<tr>
<td>An increase in a nurses' workload by one patient increased the likelihood of an inpatient dying within 30 days of admission by 7% (odds ratio 1·068, 95% CI 1·031-1·106)</td>
<td>Nurse staffing levels are continuously decreased to meet economic goals</td>
</tr>
</tbody>
</table>

Ref 1, Ref 2, Ref 3, Ref 4, Ref 5

Obviously we can monitor processes that really matter:

It is high time to monitor drug therapy with at least the same standard as preparing pizza.
Necessary for health IT to be meaningful

✓ Unique identifier for patients

✓ European coding systems for
  ✓ Drugs
  ✓ Drug ingredients
  ✓ Dosing of drugs
  ✓ Lab tests and lab test results

There will be no interoperability without these coding systems!
Necessary to achieve medication safety

1. Adequate individual and institutional risk-awareness and risk-attitude has to be achieved
2. Proactive risk-assessment of drug therapy processes using FMEA and re-design of processes for resilience has to be mandatory
3. Medication safety has to be measured continuously in routine care
4. Physicians should be obliged to check drug therapy in polypharmacy patients yearly
5. The patients’ right, the physicians’ and hospitals’ responsibility to guarantee, and the health insurance companies’ duty to support patients and physicians to achieve medication safety should be part of German (SGB V) and European law.
Summary:

We will only achieve Medication Safety if we do not consider it as one of several competing priorities, but as a precondition of providing care.