Critical Success Factors for Medication Safety

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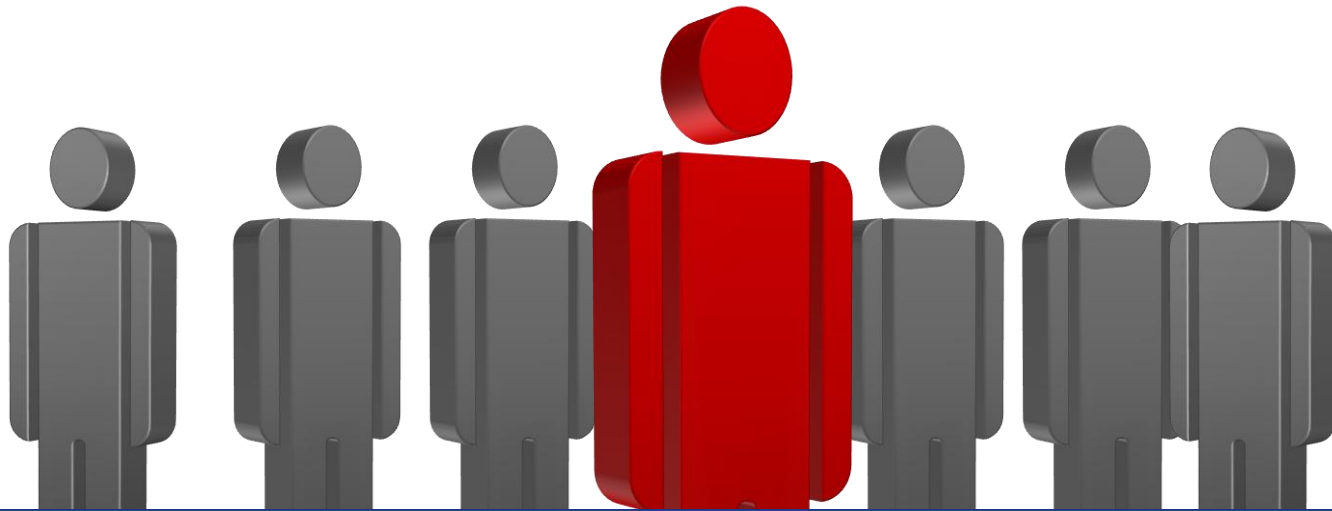
2 of 3 of patients suffer from **side-effects**
of prescribed drugs at the time of hospital admission

Causes and types of Medication Errors

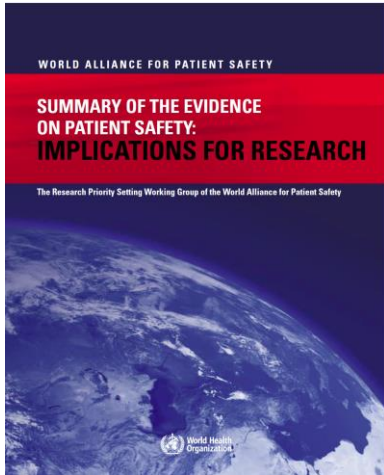## Adverse events due to drug treatment
Ashish Jha, Daniel Grandt

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

Errors of commission	Errors of omission
Health system level	
Necessary information for safe use of drug lacking	Drug not available
Substandard drug	Drug too expensive be used
Counterfeit drug	
Error-prone conditions	
Look-alike medication	
Sound-alike medication	
Process organization and resources	
Provider level	
Physicians	**Physicians**
Inadequate prescription	Failure to prescribe drug
Lack of knowledge about drug	
Lack of information on patient	**Other professionals**
Lack of medical knowledge	Failure to administer drug
Failure to apply medical knowledge	
Failure of follow-up	
Failure to recognize drug side-effects	
Other professionals	
Failure to administer drug correctly	
Failure of patient identification	
Patient level	
Intentional or unintentional lack of adherence	Intentional or unintentional lack of adherence

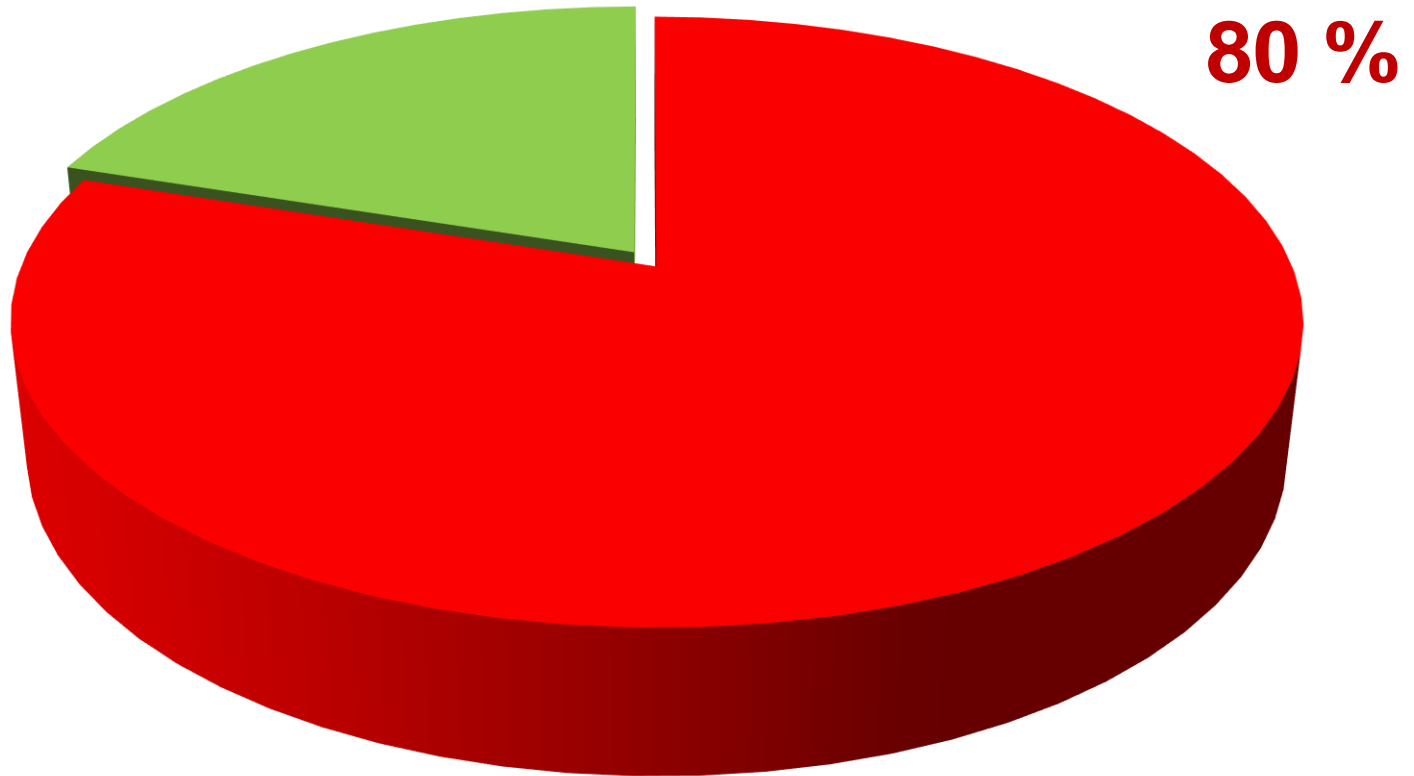**Prescribing errors are the most relevant cause of preventable ADE**

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

80 %

Leal H.M., Aten Primaria, 2004.

Medication Errors: Contributing factors
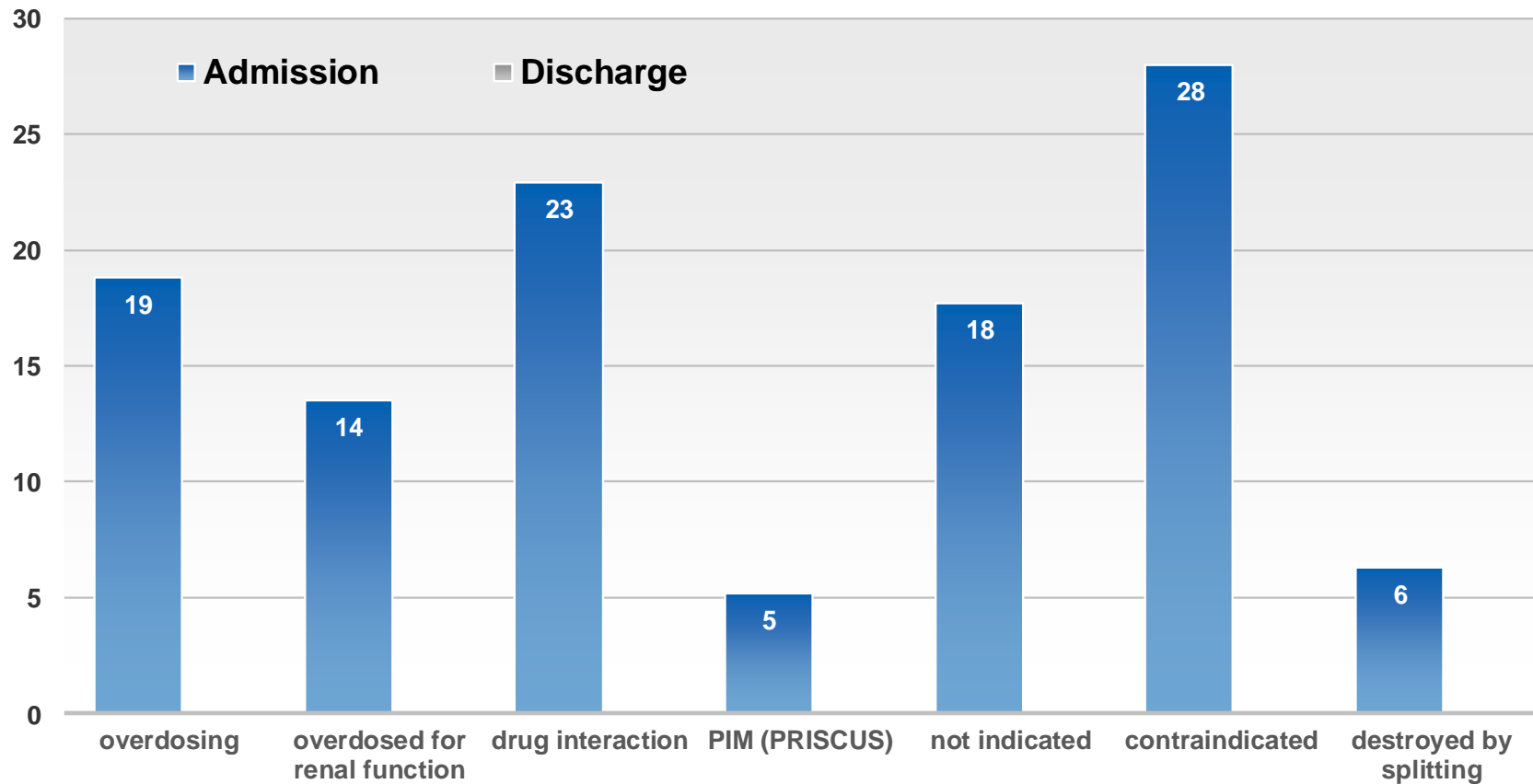
1. **Missing information on the patient**

2. **Inadequate prescribring decisions**

    ➢ **Wrong drug / dose for disease / patient**

    ➢ **Dangerous drug – drug combination**

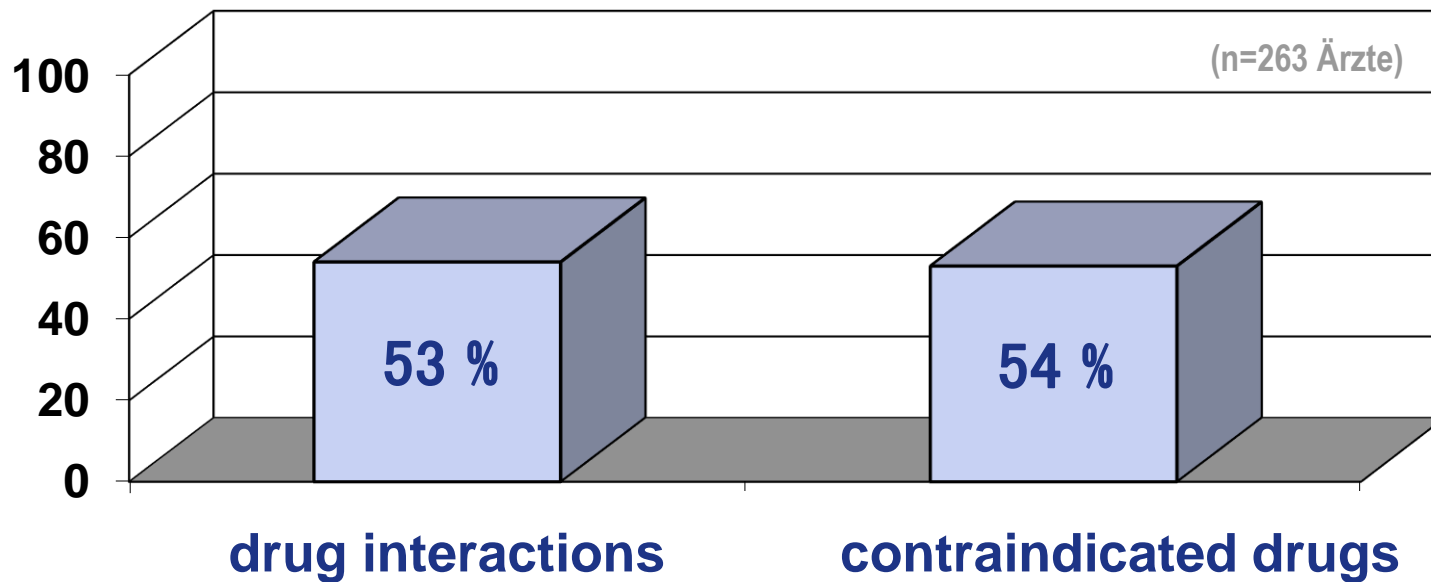   ➢ **Failure to monitor and adjust / discontinue therapy**

Prescribing errors in outpatients studied on hospital admission

% of patients

n=200 patients, tertiary care hospital, NRW

Even experienced physicians detect only half of the prescription errors without IT support

% detected without clinical decision 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

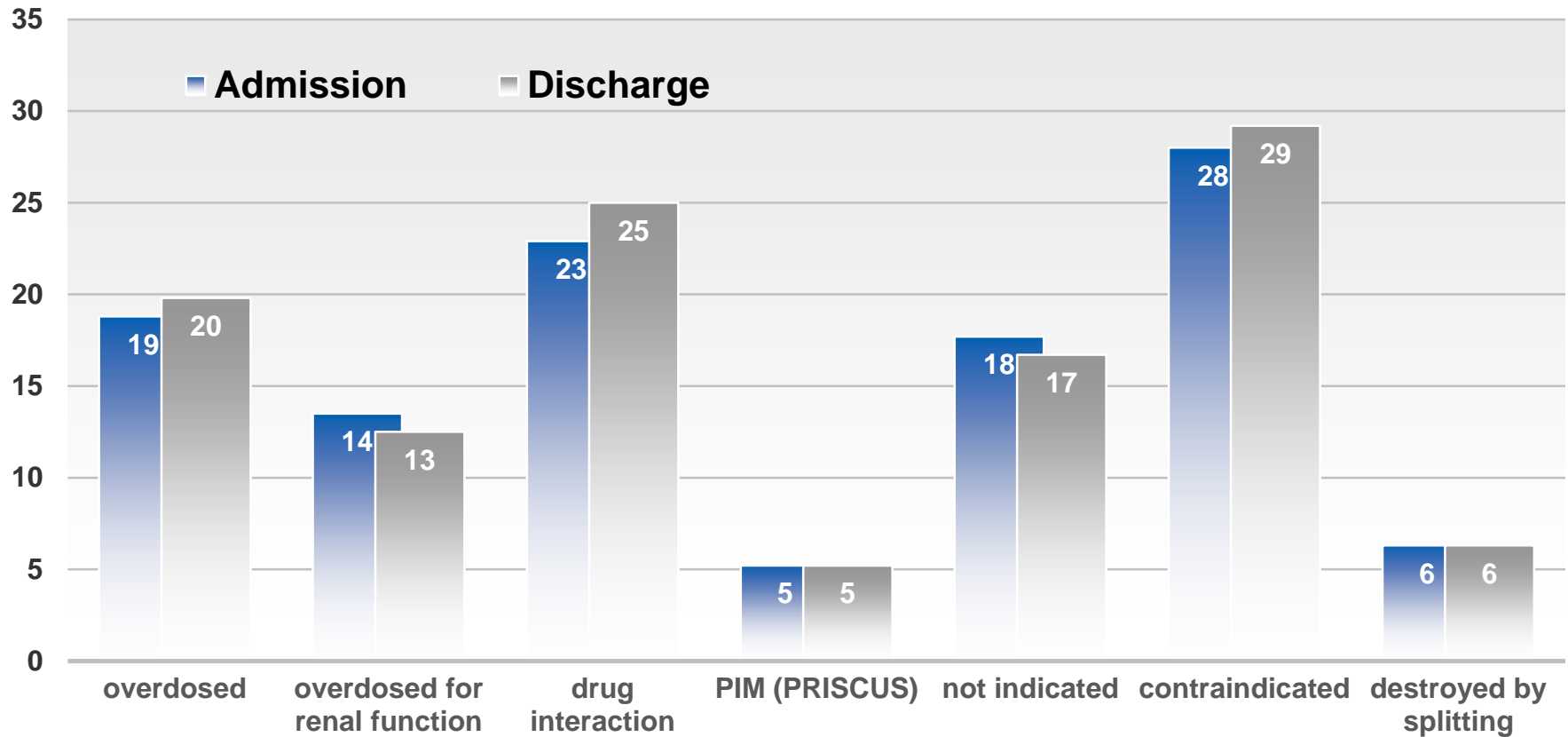| Category	Value
1st yr.	8,4 %
2nd yr.	10,3 %
specialist	8,3 %
senior phys.	6,8 %
head of dept.	5,9 %
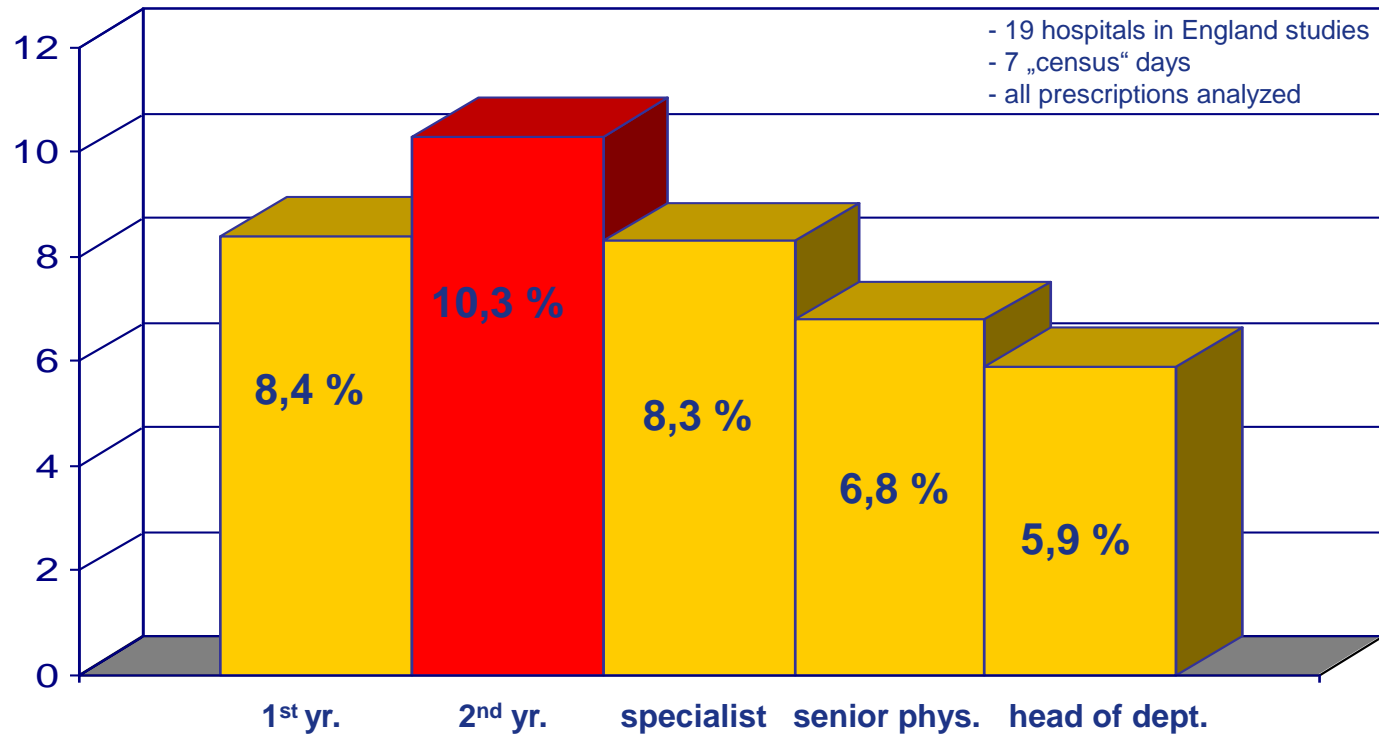
Prescription errors in % of all prescriptions

„To err is human"

No positive effect of hospitalization on medication safety

% of patients

Chart legend: ■ Admission ■ Discharge

Category	Admission	Discharge
overdosed	19	20
overdosed for renal function	14	13
drug interaction	23	25
PIM (PRISCUS)	5	5
not indicated	18	17
contraindicated	28	29
destroyed by splitting	6	6

n=200 patients, tertiary care hospital, NRW

Medication Errors: Contributing factors

1. Missing information on the patient

2. Inadequate prescribring 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, perhap… sified payer and policy focus … ning to lower readmission r…

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
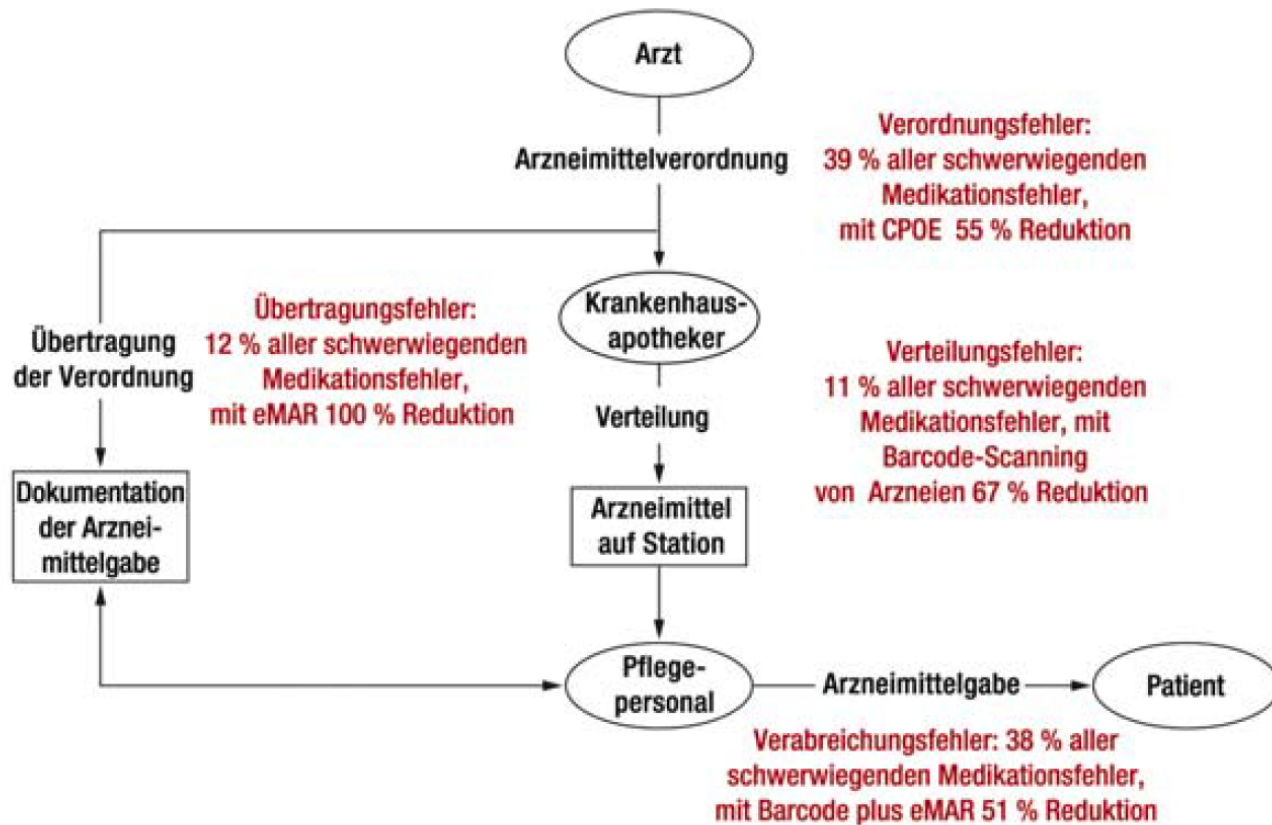- ✓ 1st Roadmap to Medication Safety for Germany

GRAFIK

Effekte moderner Informationstechnologie auf den Prozess der Medikation im Krankenhaus

Arzt

Arzneimittelverordnung

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

Übertragung
der Verordnung

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

Krankenhaus-
apotheker

Verteilung

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

Dokumentation
der Arznei-
mittelgabe

Arzneimittel
auf Station

Pflege-
personal

Arzneimittelgabe

Patient

Verabreichungsfehler: 38 % aller
schwerwiegenden Medikationsfehler,
mit Barcode plus eMAR 51 % Reduktion

Daten aus verschiedenen Studien, modifiziert nach: NEJM 362, 2010, 1706

eMAR: elektronisches Medikationsadministrationsprotokoll; CPOE: elektronisches Verordnungssystem

Why don´t we succeed in preventing medication errors although it is possible?
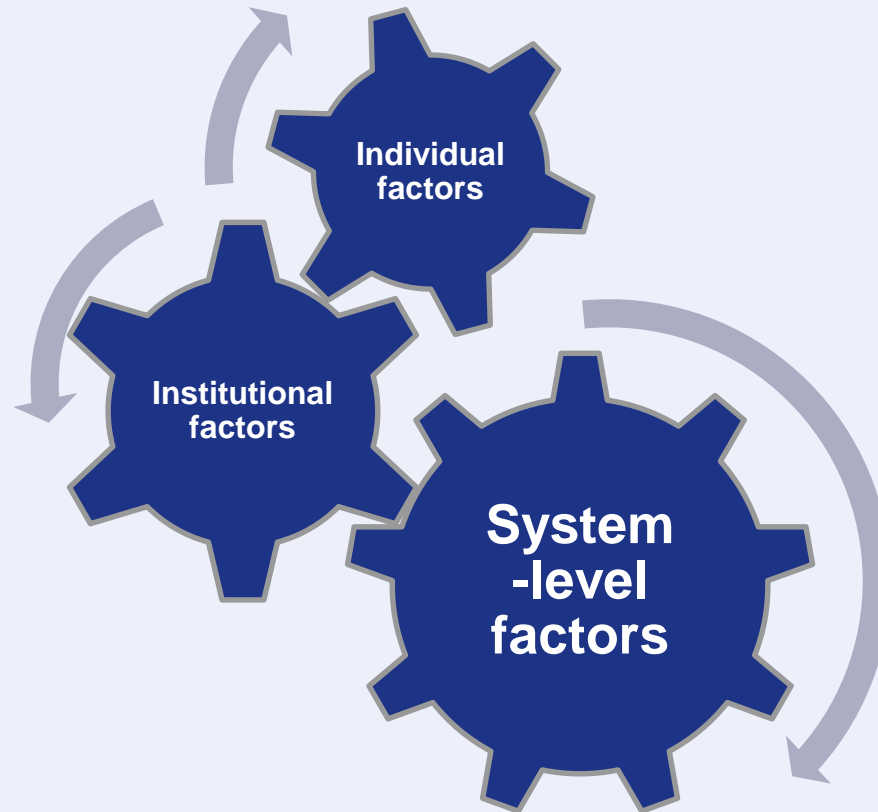
.. determine the level of safety that can be achieved
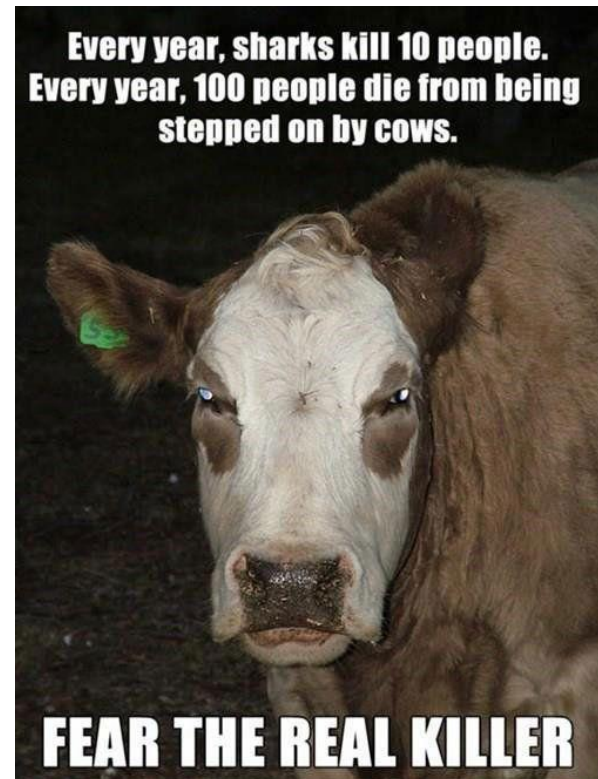
Root-Causes of Medication Errors

1. Inadequate risk awareness

Inadequate **Risk Awareness**

Failure to adequately handle statistical risks

Individual & Institutional

.. many are afraid of sharks

Every year, sharks kill 10 people. Every year, 100 people die from being stepped on by cows.

FEAR THE REAL KILLER

WeKnowMemes

Root-Causes of Medication Errors

1. Inadequate risk awareness

2. Inadequate risk attitude

Inadequate Risk Attitude

Individual & Institutional

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
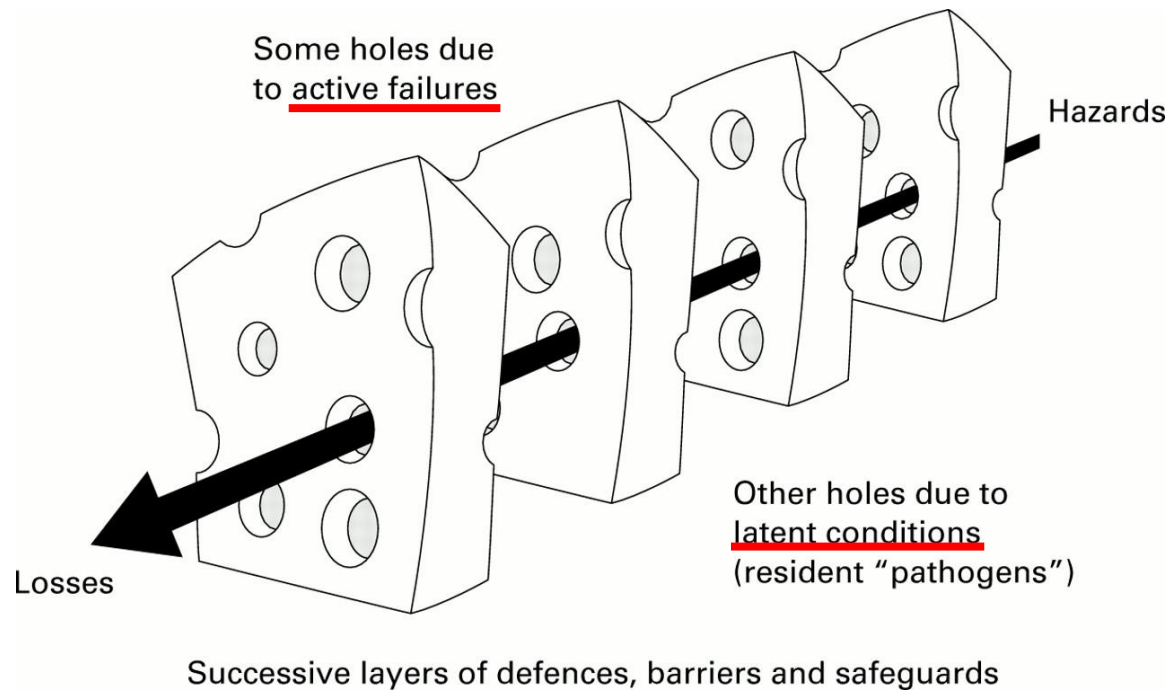
have been interviewed:

- 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

Some holes due to **active failures**

Hazards

Other holes due to **latent conditions** (resident "pathogens")

Losses

Successive layers of defences, barriers and safeguards

.. 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"

Individuelle Faktoren
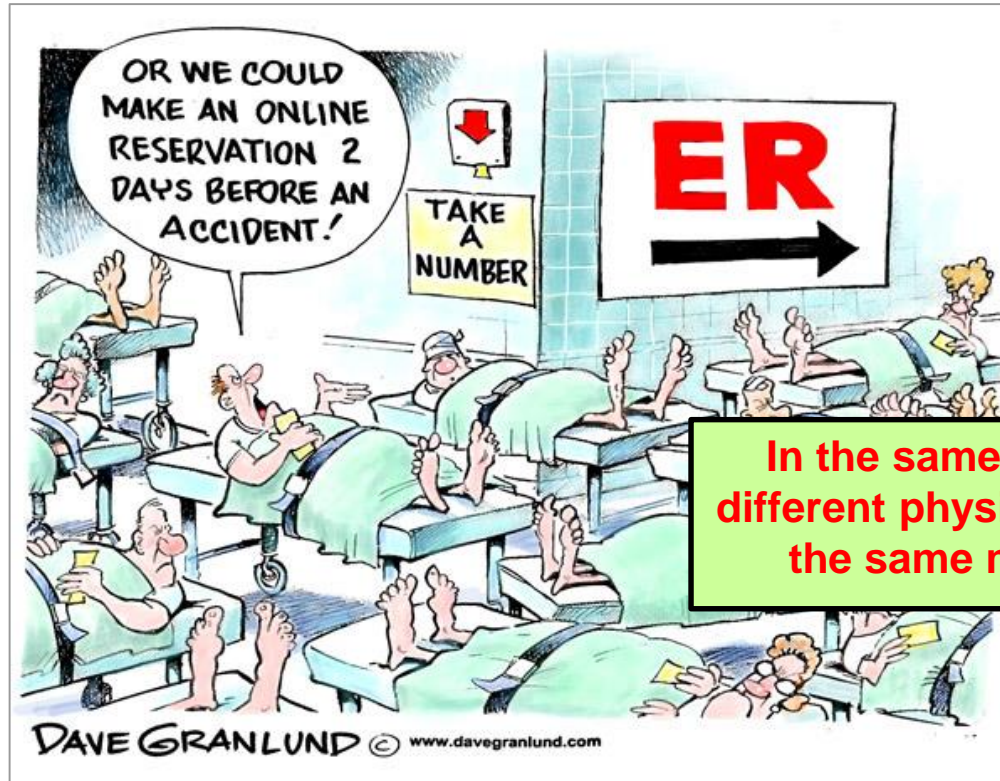
In the same situation different physicians make the same mistakes

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-Responsibilty Mismatch

Authority-Responsibility Mismatch

System-level factors

.. 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 spents 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

Institutio-nelle Faktoren

What we know	What we do
Error rate increases if a physician is interrupted while caring for a patient Ref 1	Physicians are interrupted up to 9 times while taking an admission interview (hospital, Denmark) Ref 2
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. Ref 3,4	High bed occupancy rates are considered an indicator of high productivity for hospitals and a strategic goal.
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) Ref 5	Nurse staffing levels are continuously decreased to meet economic goals

1. Westbrook JL et al. Arch Int Med, 2010.
2. Ghazanfar MN et al. Dan Med J 2012.
3. Elliott DJ et al. JAMA Intern Med 2014.
4. Madsen F et al. Health Aff (Millwood) 2014.
5. Aiken LH eta al. Lancet 2014.

Obviously we can monitor processes that really matter:
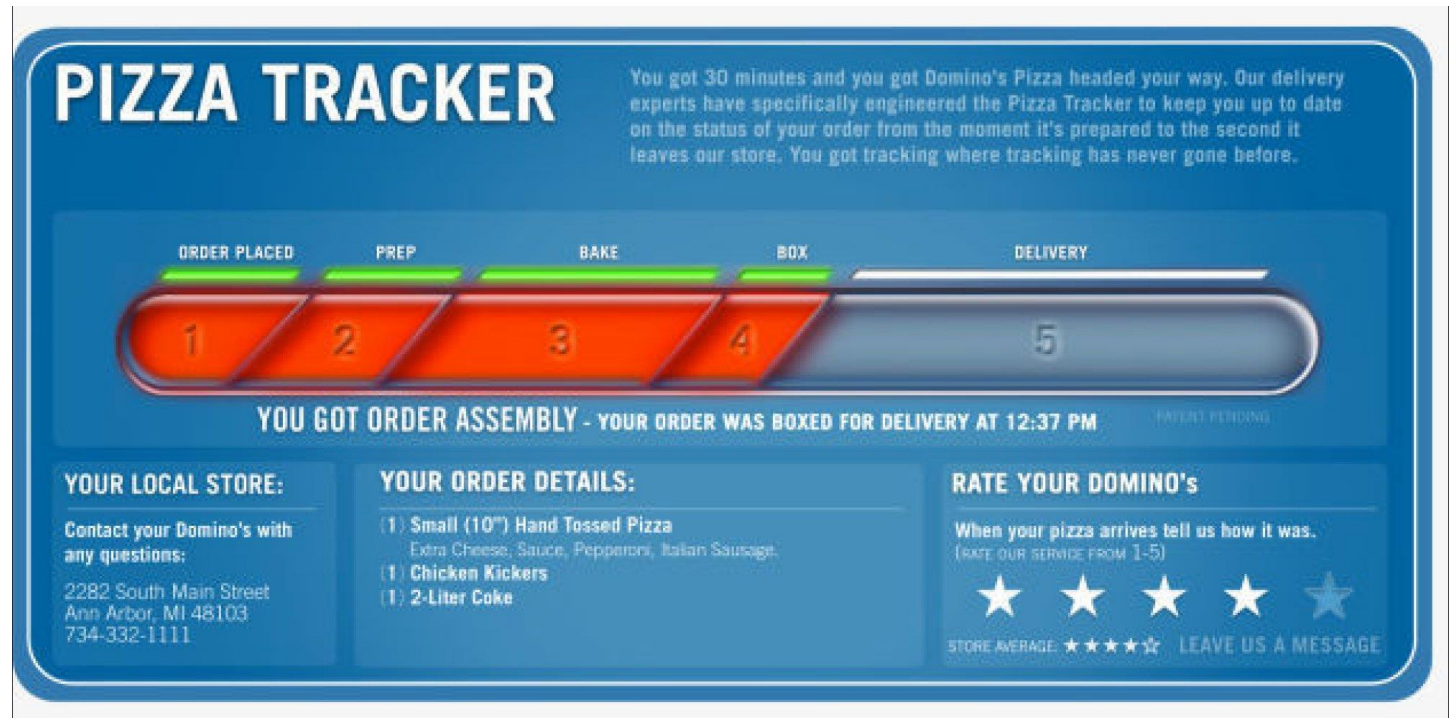
It is high time to monitor drug therapy with at least the same standard as preparing pizza.

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 und risk-attitude has to be achieved

2. Proacative risk-assessment of drug therapy processes using FMEA and re-design of proscesses 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´ responsibilty 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 provinding care**