IMPACT OF INFORMATION TECHNOLOGIES ON MEDICATION SAFETY

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Adverse events

- Out of 100 hospitalized patients
  - 12 will be impacted by an adverse event
  - 6 by an avoidable event (50%)
    - 1.5 linked to medication (25% of avoidable, 1st cause)
    - 0.7 with severe or fatal impact (12% of avoidable)

- 1 avoidable adverse event linked to medication every 66 patients and a severe event every 550 patients

Meta-analysis of 70 studies, n=337'025 patients

Panagioti M, BMJ 2019;366:l4185
Medication safety: the 3P’s

**Processes**
- Information technologies (IT)
- Non - IT

**Persons**
- Healthcare professionals
- Patients

**Products**
- Internal production (GMP)
- Products presentation (RTU, design)

**Tools** (incident declaration, risk analysis, …)
The 3 main benefits of information technologies

- **Safety**
  - Reduce errors in calculation, selection, controls, …

- **Efficiency**
  - Produce more with a constant staff
  - More time for patients

- **Traceability**
  - Electronic management of drugs, batch number, falsified drugs, …
IT at each step of the process

EDI

Robotized distribution

Central pharmacy stock

Ward stock

Automated dispensing cabinet

CPOE

Clinical information system

Industry stock

Distribution with scanning

Bedside scanning

Logistic information system
Robotized distribution: Impact on safety

François O et al, HUG, 2015
Automated dispensing cabinets (ADC): Impact on safety

Real-life observation
8 wards without ADC
8 wards with ADC
medicine and surgery
132 nurses

n = 2924
p = 0.0001

Traditional pharmacy
n=1248

ADC
n=1676

- omission
- schedule
- dosage
- pharmaceutical form
- INN

Jumeau Vallee M, HUG, 2020
Summary: impact of IT on medication safety

- Ordering errors, 39% of all serious medication errors
  - With CPOE, 55% reduction
  - 39 → 18

- Dispensing errors, 11% of all serious medication errors
  - With pharmacy bar-code scanning, 67% reduction
  - 11 → 4

- Administration errors, 38% of all serious medication errors
  - With bar-code eMAR, 51% reduction
  - 38 → 19

- Transcription errors, 12% of all serious medication errors
  - With eMAR, 100% reduction
  - 12 → 0

- Medication administration record

- Nurse

- Patient

- 100 - 58%

- 42
Lessons learned

- Automation and robotization are important strategies to optimize drug management
  - Safety, traceability and efficiency can be improved and return on investments have been demonstrated
  - Information technologies help eliminate a large number of errors related to human factors
  - Hospitals have to invest in these innovative systems to improve patient safety
  - Zero error is not a reachable objective, even with the best technology
  - Other actions must also be promoted to optimize the final impact

In period of crisis, a safe and efficient organization is even more important!
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