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Medicines Shortages

The Role of the Hospital Pharmacist

Hospital Pharmacists as Troubleshooters

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Abstract

Hospital Pharmacists are in the driver's seat of the pharmaceutical supply chain. They are mandated to provide the employer's patients with medicinal products and accompanying services. All troubleshooting and debugging actions arising from disruptions of the supply chain are a process which binds unnecessarily many human and technical resources. In this presentation some typical cases are presented as an inspiring start of the program.

Learning objectives

At the end of this session, participants will be able

To know hospital pharmacist's challenges in situations of non-availability of registered products

To recognize the extent of the global phenomenon

To participate and provide actively inputs in professional task forces to improve the shortages situation

45', 30 slides

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No Conflict of Interest

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Is it just a joke?

Company „*Poorveyor*" is not telling us that they cannot supply us with Factor XIII

We just learnt it by placing an order entry

In the afternoon a market research company assigned by „*Poorveyor*" calls us to run an interview with the question

→ ***„What are your quality criteria to select a blood derived product for your formulary?"***

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Agenda

- Status quo of drug shortages
  - global, regional, local
- Troubleshooting
  - switching drugs, switching suppliers
  - „looking for the right patient“
  - information for users
  - relevance of drug shortages

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Status quo of drug shortages

Globally

EAHP-survey, literature

National

What is legislation trying to cope with the problem?

Hospital (regional)

statistics, documentation

Drug shortages at UKHD: Some statistics

„Supply chains“

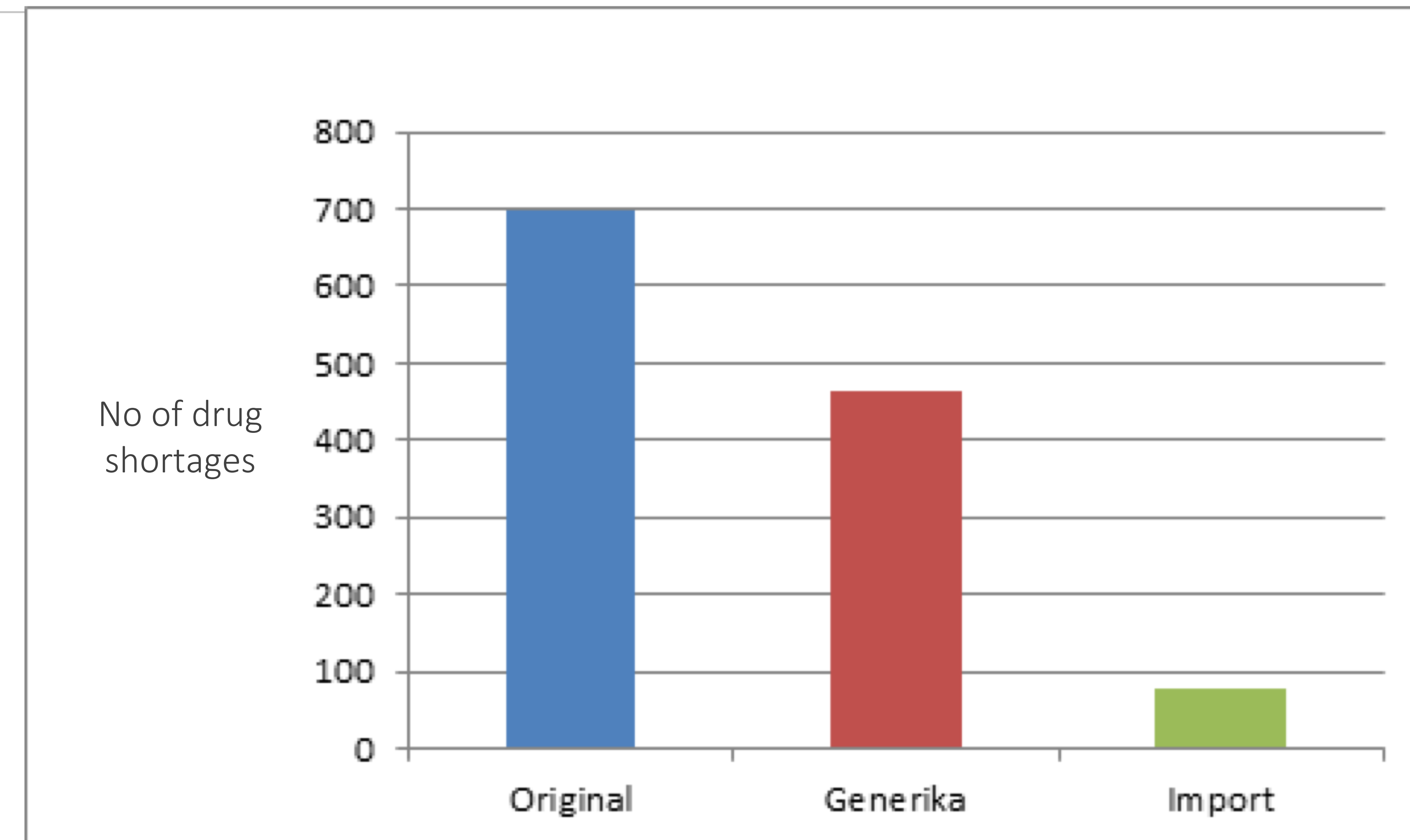
1247 drug shortages in 2011-2017

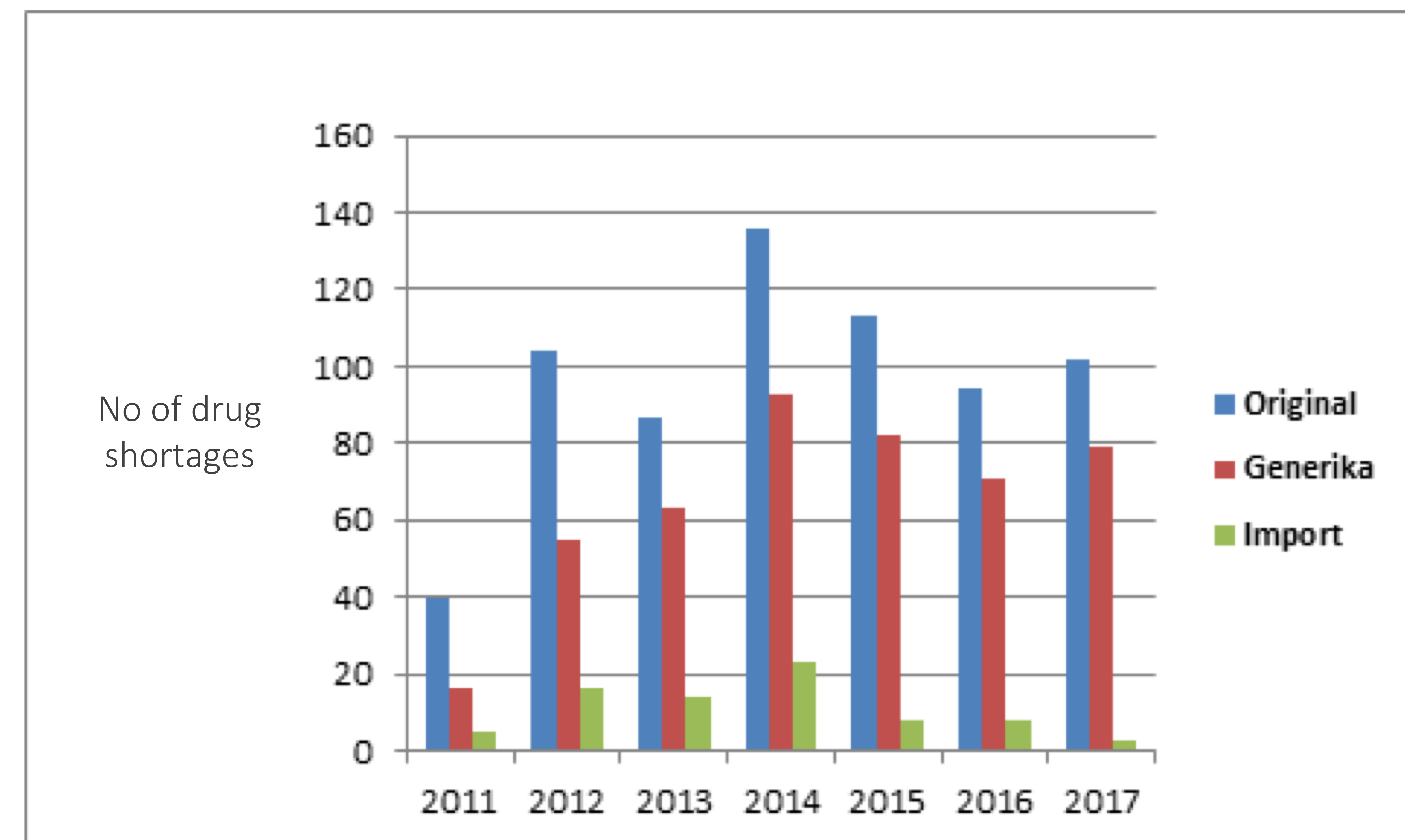
Originator: 700 (2,5fold since 2011)

Generics: 464 (5fold since 2011)

imported drugs: 78 (level of 2011 in 2017, after peak in 2014)

peak of drug shortages in 2014





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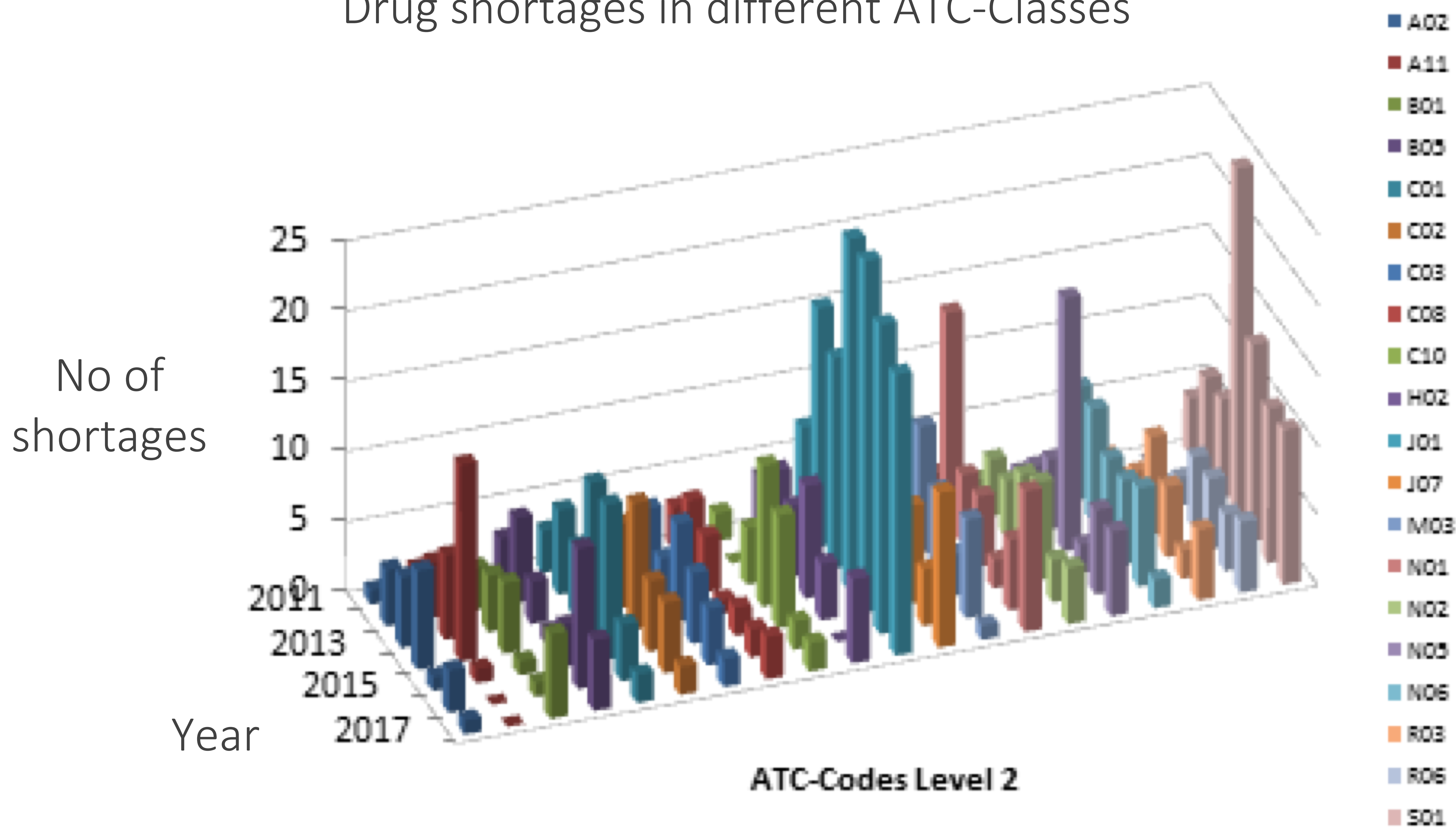
Drug shortages at UKHD: Some statistics



Big problems in certain ATC-Classes

J01: Antibiotics

S01: Ophthalmologicals

C: Cardiovascular system

N: CNS

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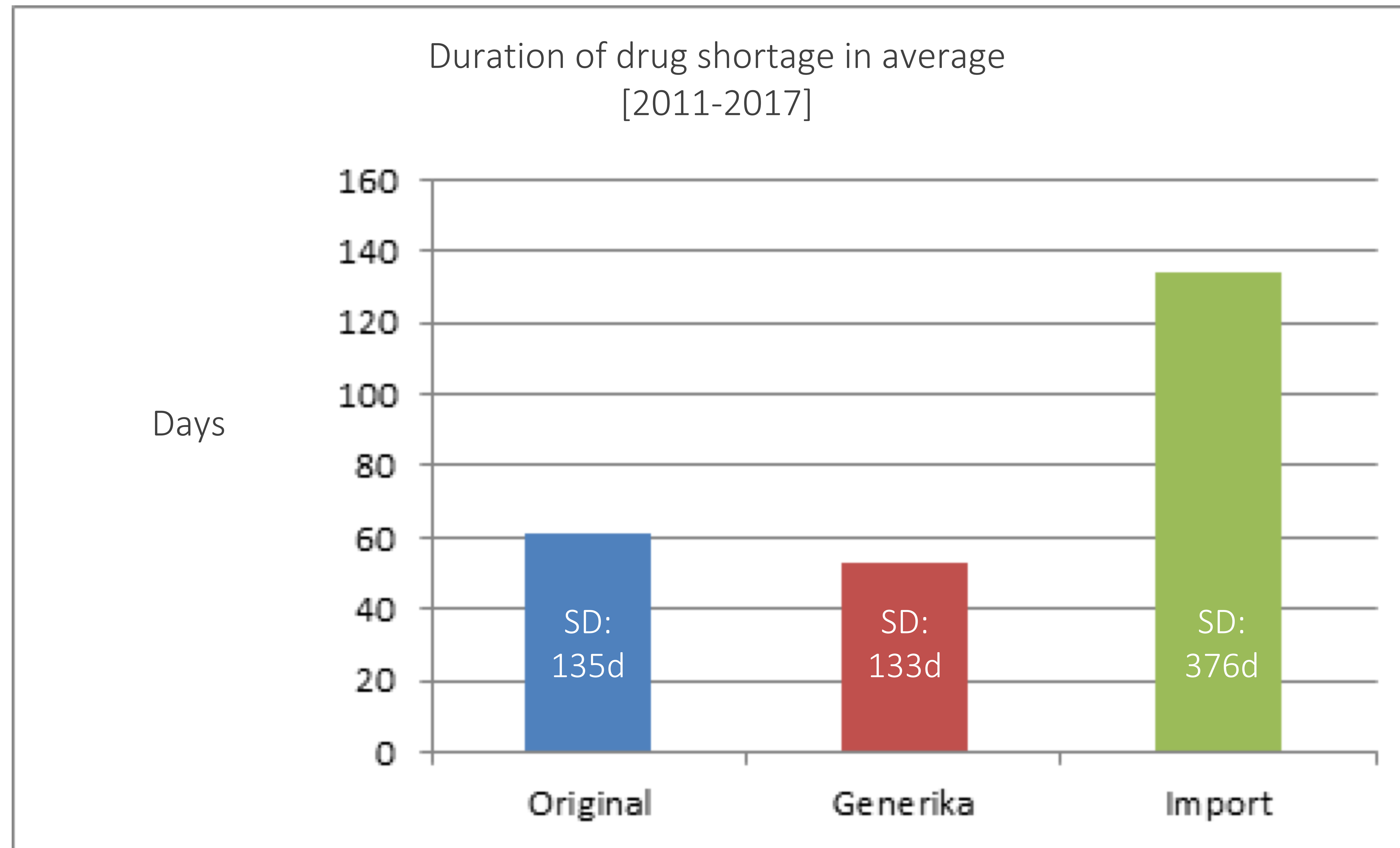
Drug shortages at UKHD: Some statistics

Length of duration of drug shortage



SD: Standard Deviation

Drug shortages at UKHD: Work load

255/1247 with intensified supply chain management

- 12/255 → no alternative drug therapy
  - alternative drugs → generics (205), hospital pharmacy production (10), import of drugs (28)
  - 81/243 → „Off-Label-Use“
  - 36/243 → different active substance
  - 9/243 → different ATC-Code
- moderate to high workload in 36 cases → e.g. different supply chain (wholesaler, price↑)
- low to moderate workload in 45 cases → e.g. different package sizes
- low workload in 156 cases → e.g. supply of smaller subset than ordered
- no workload in 755 cases → hospital pharmacy increased number of drugs on stock

In any case: work load due to additional drug information!

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Drug shortages at UKHD: Workload

workload of troubleshooting measures

- no information required
- information required
  - „extensive“
    - different active component, new guideline/guidance, different dosage regime, different route of administration
  - „marginal“
    - different package, slightly different dosage (e.g. no difference in number of tablets to take), different appearance of drug (iv-application: e.g. ampoule vs. infusion vs. ready-to-use syringe)

Troubleshooting means quick fixes for the problem of drug shortages

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Drug Shortages

Some examples

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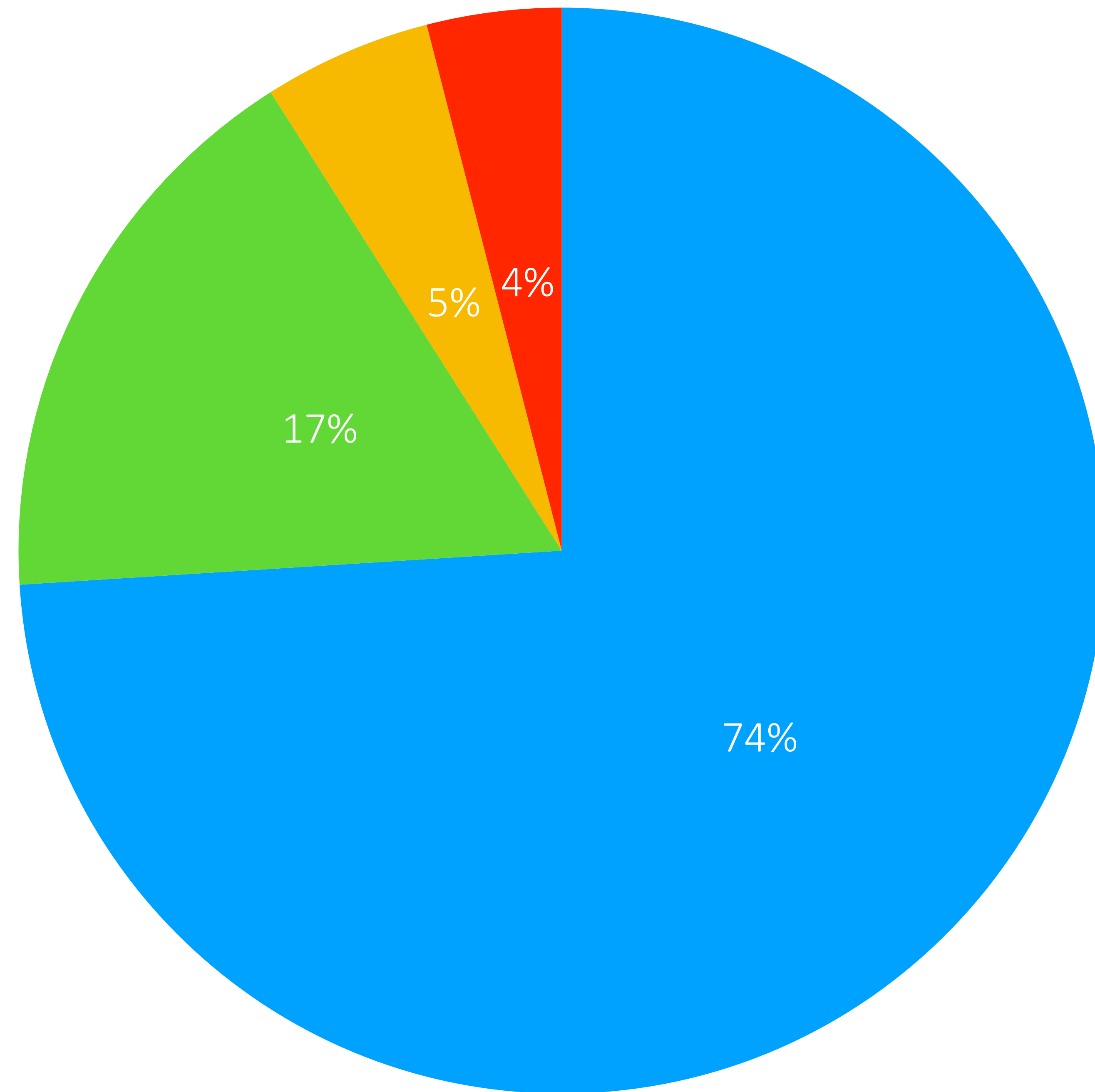
… once upon a time … …

Drug shortage of Heparin (UFH)

The situation („market“)

Ratiopharm
B.Braun
Leo (only 25.000)
Rotexmedica (only 25.000)



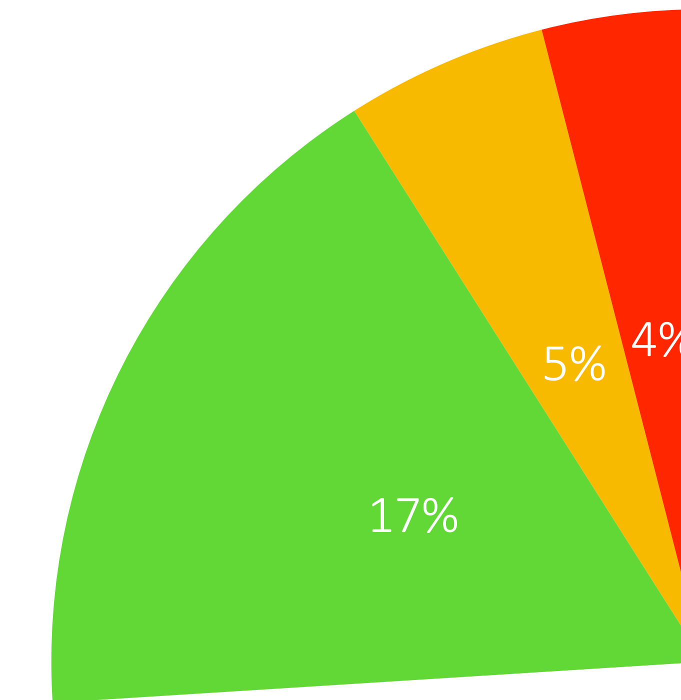
Ratiopharm: Problems with production ➜ out-of-stock

B.Braun: good customer-supplier-relationship with UKHD

but will not take us as a new customer

Other producers have no capacity to supply with UFH

B.Braun
Leo (only 25.000)
Rotexmedica (only 25.000)



Drug shortage UFH: First steps

Trying to get UFH from other companies → Ø

Import of UFH from other countries

→ BUT: different concentration, different price

Getting rest of UFH from wholesalers → Ø

„looking for patients“

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Drug shortage UFH: Troubleshooting measurements

„Is there a patient population which is dependent on UFH?“

- interprofessional discussion
  - goal: UFH switched to LMWH
- emergency situations (→ ICU)
- special procedures → heart-lung machine, cardiosurgery
- restriction for prescribing
  (Single patient related prescription; Reason?; Why not LMWH?)

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Drug shortage UFH: What to do?

- general information/making the shortage transparent
  - how long will shortage last
  - what is the impact on patient care
  - what is the impact on work load for health-care professionals
  - what are the reasons for the shortage
  - what is the impact on drug expenditure
  - what is the risk (→ medication safety)
- use the drug shortage for political discussions
- use the drug shortage to bring the problem to the public
- document the problem

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… once upon another time … …

Drug shortage of some antimicrobial agents (ABx's)
(→ over the same period!)

ampicillin (mono), piptazo, amoxiclav

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Drug shortage ABx's: First steps

Trying to get ABx's from other companies → ∅

Import of ABx's from other countries → ∅

Getting rest of ABx's from wholesalers → ∅

Involving ABS Group (subgroup of P&T Committee)

- „looking for patients"
- discussing the risks
  - → shift in resistance rates
  - what about existing guidelines

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Drug shortage ABx's

- D&T committee, subgroup ABS
  - local guidelines to be temporally changed
  - guidance for switching of ABx
  - measures to see if shortage has impact on
    - outcome
    - resistance rates

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… and another one … …

Drug shortage of thiopental due to GMP-problems

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Drug shortage thiopental: First steps

Where is it used?

What patients are effected?

What about our stock?

How long will drug shortage last?

Suddenly BfArM and Drug Commission of the Medical Fraternity calls us asking about the impact on therapy and patients

Other suppliers?

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Drug shortage thiopental: Information on national level

Other drugs to use instead

propofol (BUT: allergy to soy)

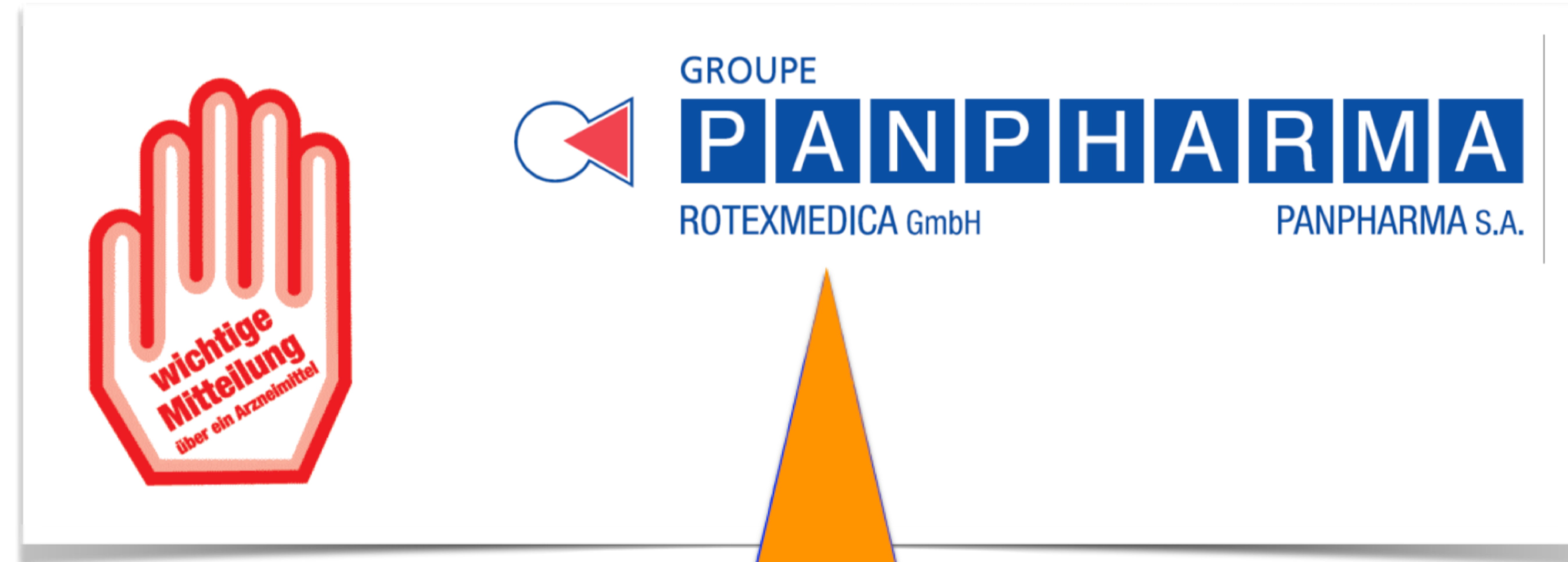
Drugs not to be switched to

etomidate, ketamine

Essential indications

Tx of intracranial pressure not reacting on other therapies

Anesthesia in newborn and premature children (no indication for propofol)



What about thiopental from other suppliers?

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Drug shortage: No way out … …

… … and what about the ethical approach of big pharma?

Botulism-Antitoxin

EU ~ 100/y; DE ~ 10/y

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Conclusion

The goal of a hospital pharmacist in the context of drug shortages is

to make the shortage „invisible“ for other healthcare professionals and patients

To reach this goal the hospital pharmacist

will find alternative suppliers

will find alternative drugs (→ switching)

… … …

Information of all parties is crucial

The hospital pharmacist has to act locally to solve the problem for his patients but also on a national level to solve the problem of drug shortages in total

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Dr. Torsten Hoppe-Tichy

Medicines Shortages

The Role of the Hospital Pharmacist

Pragmatic coping Strategies in Hospital Pharmacies

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Abstract

In practice, hospital pharmacists have learned to spontaneously deal with shortages. In most cases, exchange within regional networks is practiced. Another current option is to import. This however switches the problem to an international level to the disadvantage of low-price countries suffering particularly from parallel exports. This presentation lists a couple of fast-track optional activities to bridge intermediate gaps in the supply chain irrespective of the long-term international situation.

Learning objectives

At the end of this session, participants will be able

To know further options to bridge supply chain gaps

To recognize that such actions only translocate the problem but do not resolve the global shortages problem

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No Conflict of Interest

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Agenda

Presentation of coping strategies and their outcome for

- finances
- physicians
- nurses
- patients
- therapy
- other hospitals
- other countries
- pharmacists

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Just to make it clear … …

→ Drug shortages have finacial impacts for hospitals!

Antibiotics, Australia

Expenditures changed from 12 - 300%

Price savings in two cases (approx. -50/-10%)

Additionally, other costs associated with increased antimicrobial stewardship resources required to effectively manage antibiotic shortages are harder to quantify but likely to be significant also.

The national piperacillin/tazobactam and gentamicin shortages in our hospital were accommodated by increased use of high-cost and potentially less desirable antibiotics (…)

Khumra S, Mahony AA, Misha Devchand M et al. Counting the cost of critical antibiotic shortages. J Antimicrob Chemother 2018; doi:10.1093/jac/dky410

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Pragmatic coping strategies are strategic approaches to overcome drug shortages

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Possible Coping Strategies

new therapy guidelines/long term switch to other drugs

hospital pharmacy drug production

import of drugs from other countries

supplier assessment strategies

fine for breach of contract

Guidelines

Guidelines have to be adopted to country specific rules/laws

e.g. import possible?

e.g. off-label-use allowed/reimbursed?

Interprofessional approach is mandatory

➜ urgency?

➜ evidence of use?

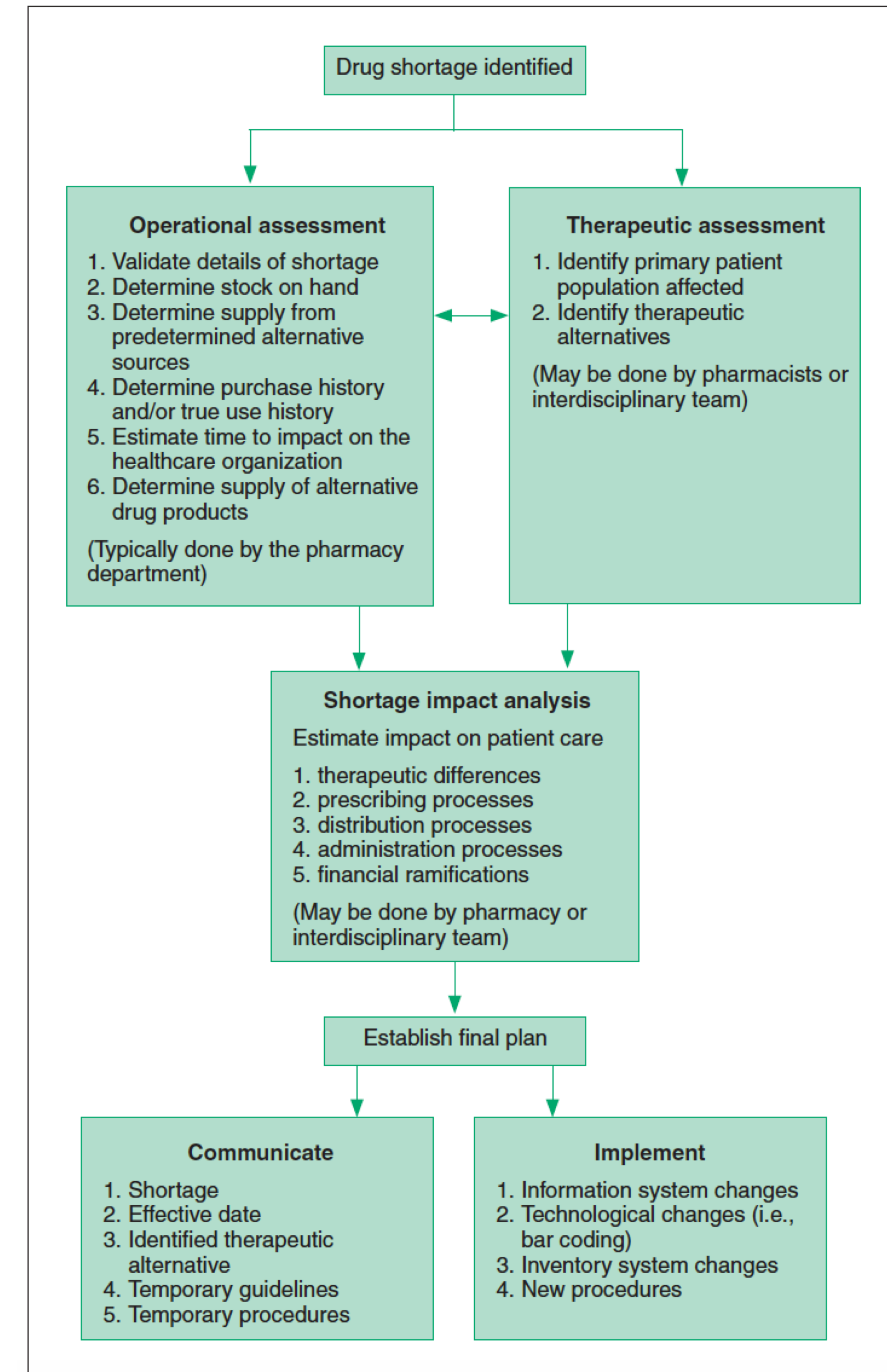

Figure 1. Process for decision-making in the management of drug product shortages.

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Fox ER. Am J Health-Syst Pharm 2018;75:e593 and cited literature

Be prepared!

→ increasing number of drugs on stock

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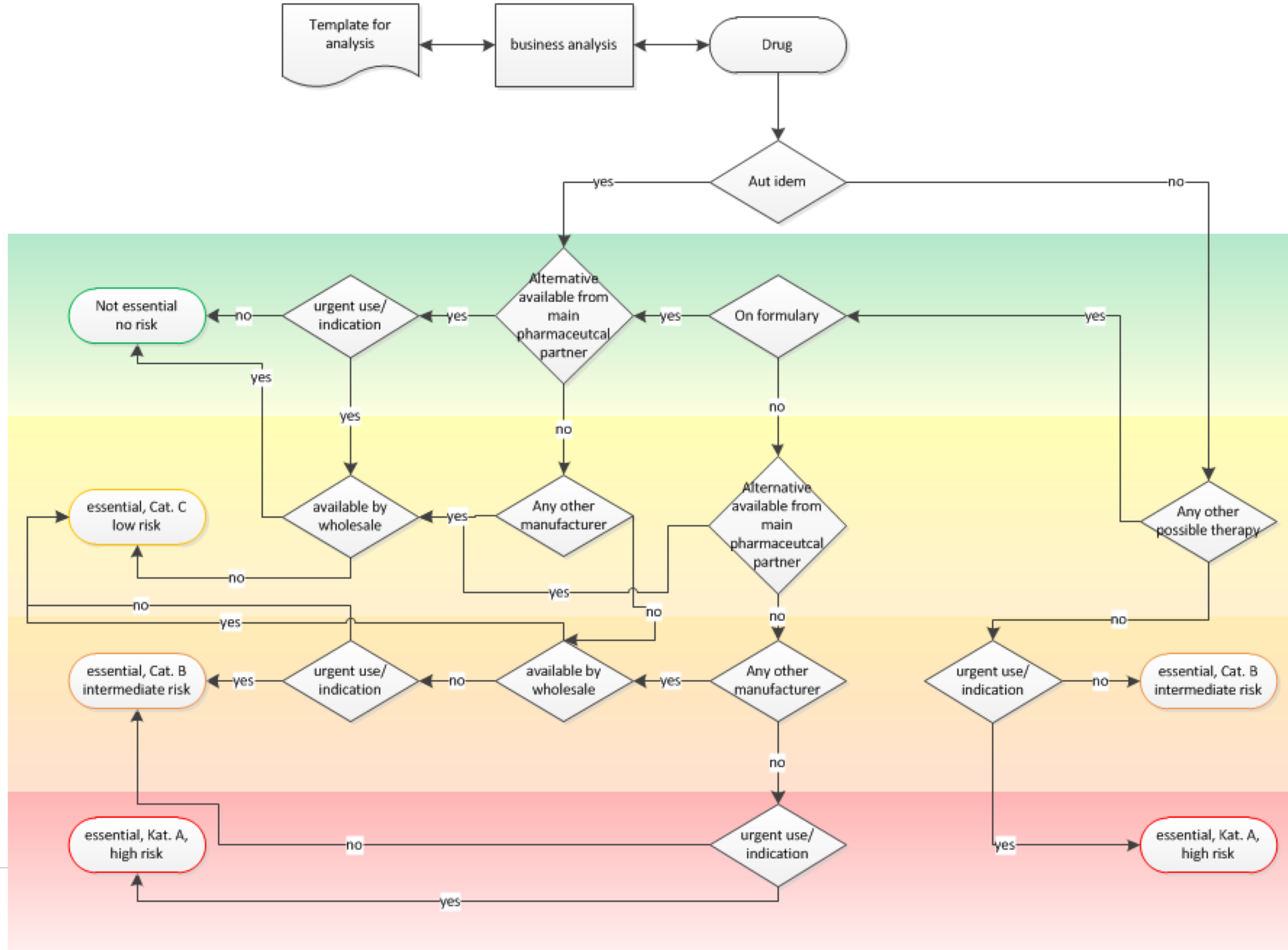
Classifying Drugs

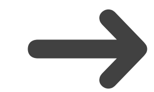
„We should not run in a drug shortage with this drug"

Kim Green, March 2018, EAHP Congress



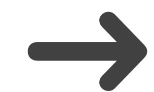
Classifying Drugs: Process

Not essential
no risk



„aut idem“ ➜ same drug from other company („customer-supplier relationship“ exists) in the market: no impact on quantity stored (stock)

essential, Cat. C
low risk

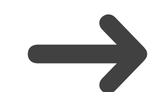


„aut simile“, different dosage, different application form in the market, available from wholesaler: information for users, no impact on quantity stored (stock)

essential, Cat. B
intermediate risk

manufacturer without „customer-supplier relationship“, not available via wholesaler: increased quantity stored

essential, Kat. A,
high risk



no other manufacturer („monopoly situation“): increased quantity stored

other points to mention

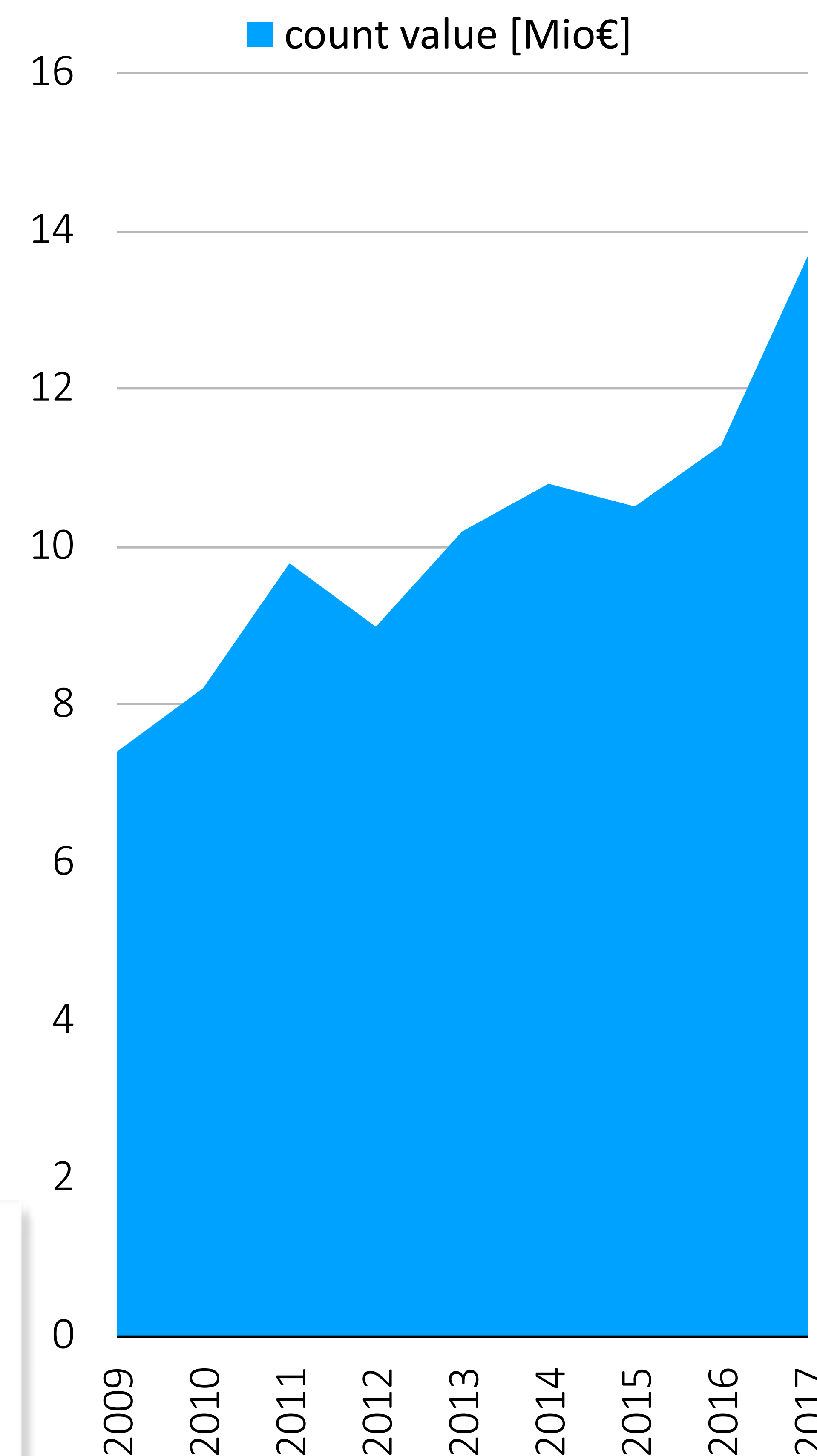
- urgency
- import
- formulary
- production

Classifying Drugs: What does this mean for the stock?

Increase in number stored for „critical drugs“ will result in financial problems

Increase in dead capital (= count value of inventory) for the hospital pharmacy

Hospital will lose flexibility for capital investments



Is the financial problem just transferred from pharmaceutical industry to hospital pharmacy?

react!

→ try to import drugs from other countries

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Import of drugs from other countries

Not possible in every country

Regulations around it

Risk of drug shortage for the next country

Price will be different → budget impact possible

Drug shortage UFH: Financial outcome

Import of UFH from

25.000 iE_{Import}: 14,38 €

25.000 $iE_{ratiopharm}$: 1,24 €

→ f=11,6

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trying to be independent!

→ drug production by hospital pharmacy

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Drug production to react on drug shortages

Barriers

regulation → general permission for hospital pharmacy, GMP etc.

financial investment/costs → rooms, machines, staff, etc.

time to start production → delay

make-or-buy decision

Drug production: What do others do?

US initiative

combat drug shortages

… … will produce generic drugs that are in short supply

or

have experienced significant cost increases

September 7, 2018

Hospital Groups Launch Not-for-Profit Generic Drug Company to Help Combat Shortages, Price Increases

ASHP Applauds Market-Based Solution to Address Top-Priority Patient Care Issues

Seven health systems have joined together to establish Civica Rx, a new venture to help combat drug shortages and escalating drug prices. The not-for-profit company will produce generic drugs that are in short supply or have experienced significant cost increases. The consortium, led by Catholic Health Initiatives, HCA Healthcare, Intermountain Healthcare, Mayo Clinic, Providence St. Joseph Health, SSM Health, and Trinity Health, collectively represents about 500 hospitals nationwide.

Although ASHP does not endorse or promote any specific company or product, the organization is pleased to see the emergence of new and innovative market-based approaches aimed at addressing the profound problems associated with drug shortages and escalating drug prices that are affecting so many patients.

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Outcome of coping strategies

finances → transfer of „costs“ from pharmaceutical industry to hospitals

physicians, nurses → risk of errors increases

patients → different/„worse“ outcomes already reported

therapy → changes in therapy are often required

other hospitals → no help among each other, bigger hospitals/university hospitals are preferred

other countries → import can empty markets in other countries

pharmacists → workload

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Conclusion (1)

In many cases *coping strategies* only shift the problem of drug shortages to other „organizations“

import ➔ emptying the market in other countries

quantity stored ➔ emptying the market for other hospital pharmacies

switching drugs/other therapies ➔ increased risk for medication errors

drug production ➔ increased workload for hospital pharmacies

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Conclusion (2)

„treating the supplier“

- penalties for breaching the (supply) contract are often only a blunt instrument
- finding a new supplier is often not possible because of concentration of drug and raw material producers
- customer-supplier relationships have changed in the age of drug shortages

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„Essential drugs must be available at all time“

- *What is an essential drug? ➜ definition needed*
- *„Essential“ ➜ different definitions from different perspectives?*
- *Who should decide about „essential“?*
- *Any regulations needed?*
- *Is the WHO list a basis?*[1]
- *Can an essential drug list overcome drug shortages?*

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[1] http://apps.who.int/iris/bitstream/handle/10665/273826/EML-20-eng.pdf?ua=1; http://www.who.int/medicines/publications/essentialmedicines/en/