OPERATING IN HEALTHCARE LOGISTICS
INTENSIVE TRAINING COURSE
10 ECTS

10 -15th February 2020, LAHTI

FINNISH NATIONAL AGENCY FOR EDUCATION

Co-funded by the Erasmus+ Programme of the European Union

Part 4: Capacity management (3 ECTS)

Source: https://blog.flexis.com/a-demand-capacity-planning-faq

Learning objectives part 4:

1. Is able to formulate policy on planning, capacity management of healthcare logistics

2. Is able to organize, manage and improve the patient/material logistics related to planning, capacity and process management

3. Is able to demonstrate how to improve the utilization rate of resources, resource planning (e.g facilities, Operating rooms, etc)

4. Is able to reproduce relevant product knowledge in relation to resources common in Healthcare

1. Is able to formulate policy on planning, capacity management of healthcare logistics

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What do you know about Capacity Management?

Several definitions exist for the concept of 'capacity management’

In this module we shall use the following description:

Capacity management refers to the optimal use of the healthcare supply, expressed in terms of capacity, within business and socially accepted frameworks.

Source: Logiz 2011

Capacity is the performance capability expressed in quantity per unit time of a capacity type or a resource, organisational unit, facility or employee.

So, for example, the amount of clients that a nurse can help in an hour with showering or the number of patients that an X-ray machine can process per day.

What do you know about Planning?

There are various definitions for planning and control. In this module we use the following definition:

Planning is a process by which, based on sufficient knowledge, conscious decisions are taken with regard to future activities and their coordination, in order to achieve a goal or goals as efficiently as possible.

Important planning aspects are the initiation of activities and the providing of means by which these activities can take place.

Two levels in volume of patient/client flows

1. The number of patients/clients per product/clients group per year.

2. Required volume per capacity category per year.

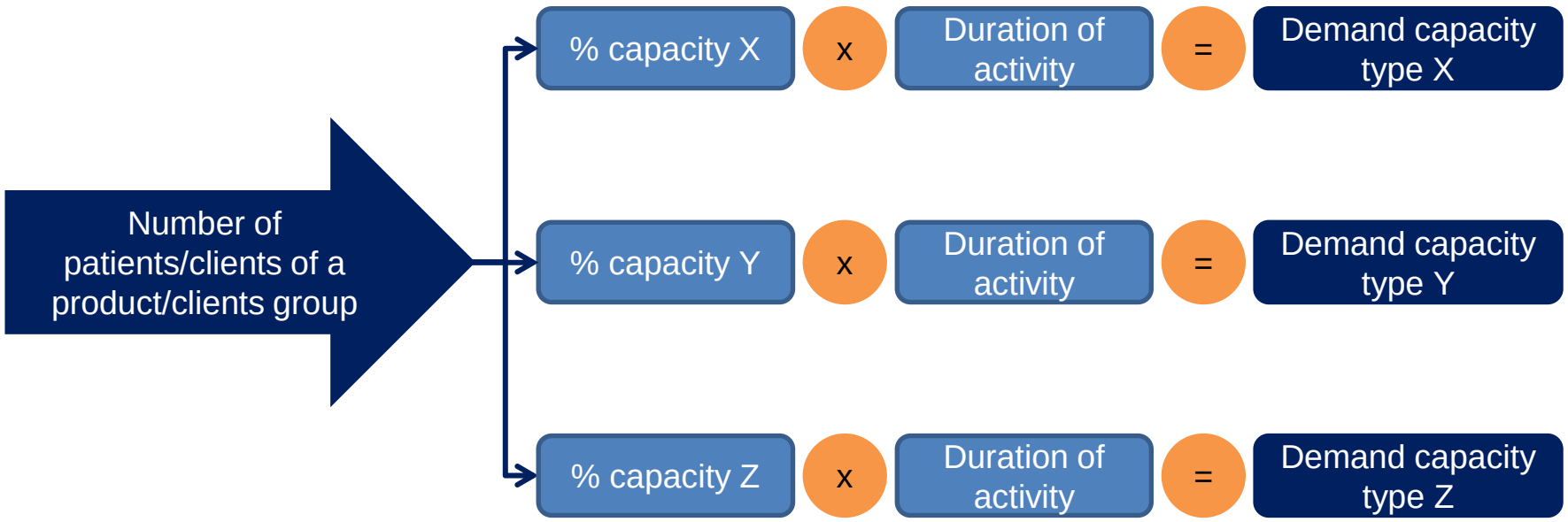
Capacity categories

Capacity categories are production factors that are USED in the production/care process, but are not consumed or processed, in contrast to materials.

Examples?

- Nurses
- Beds
- Operating rooms

Two levels of patient/client demand



Demand level 1

Demand level 2

Source: syllabus Logiz awareness module patient logistics, 2011

Calculation volume based on capacity category

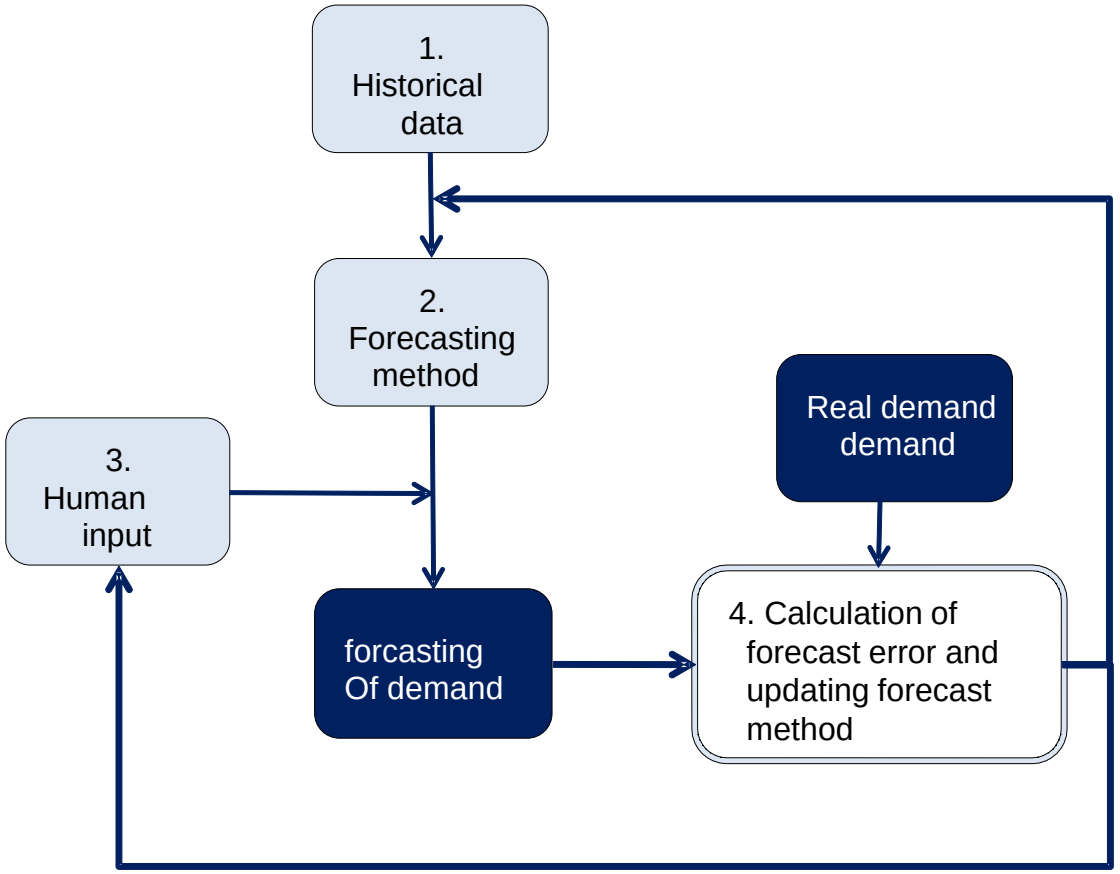
Per patient / client group you need:

- The process description with the percentage of patients/clients using the capacity type.
- Average duration of the use of the capacity type.

Demand level 1

How to determine?

Forecasting framework



Source: syllabus Logiz awareness module patient logistics , 2011

Influencing volume of clients/patient flows

Can we influence 

1. Being distinctive to patients
2. Relationship with chain partners
3. Agreements with health insurers

Demand level 1

Class assignment

Take a patient or client group in mind:

1. Specify a frequent used capacity category used by this patient/client group
2. What would you recommend to a healthcare institution in order to influence the utilization rate of the capacity category you have selected?

2. Is able to organize, manage and improve the patient/material logistics related to planning, capacity and process management

3. Is able to demonstrate how to improve the utilization rate of resources, resource planning (e.g facilities, Operating rooms, etc)

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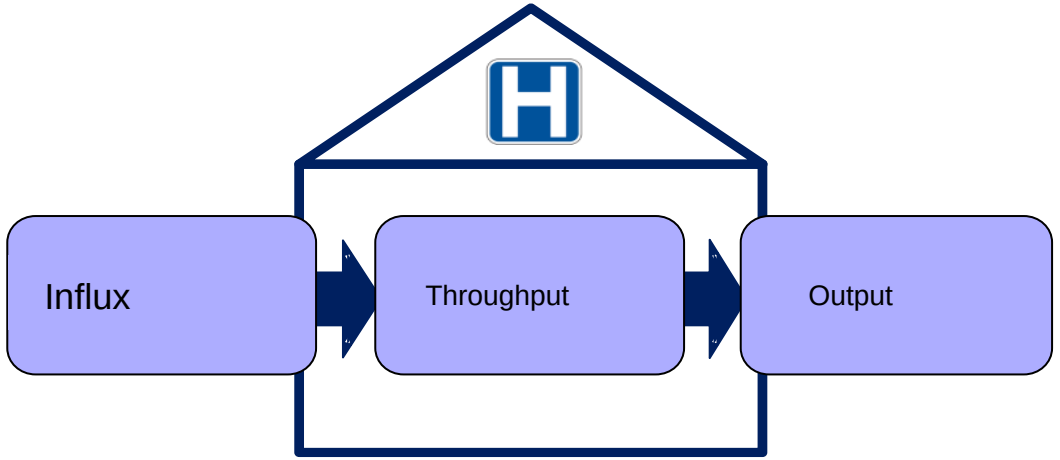
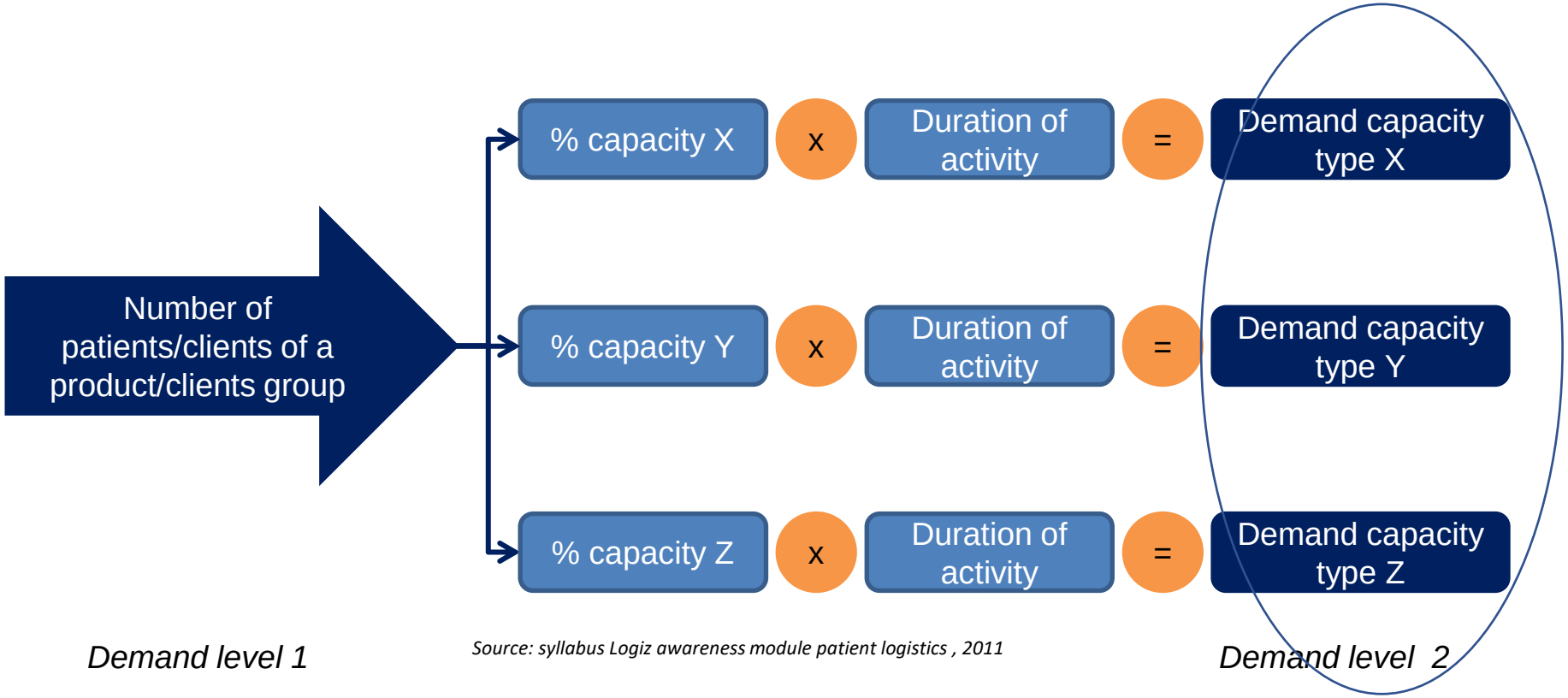
Impact on process due to increasing patient volumes



Source: syllabus Logiz awareness module patient logistics , 2011

Two levels of patient/client demand



Source: syllabus Logiz awareness module patient logistics , 2011

Calculation of demand level 2: demand per capacity category

Required data:

- Process description with percentage of patients/clients using a capacity type
- Average duration of use per capacity type

How to determine required data?

- Historical data
- Newly designed care process

Planning on several levels

1. Stratigic level

2. Tactical level

3. Operational level

Three quotes and three levels of planning

For our knee surgeries, we will need 30% of the capacity of the operating theaters in the coming year and 3 full-time surgeons will be deployed in this area.

For this week, operating theatres one and two are for heart surgery between 09.00 and 13.00 and between 13.30 and 17.00 for knee surgery. Operating theatres three and four are both for other less invasive operations.

For the next 10 years, we want to focus on a specialization in open heart surgery. We want to free up sufficient capacity for this and allocate sufficient capacity to enable this.

Why is it so challenging to align these three levels of planning?

Lack of collaboration AND

https://www.youtube.com/watch?v=Ik3B_Qo4Ku8

Example calculating volume per capacity

Capacity category	Required data
Operating room	% of patients with hip complaints receiving replacement hip surgery: 10% Average duration of hip replacement surgery: 3 hours
Ward	% of patients admitted is equal to % of patients receiving replacement hip: 50%. Average length of stay: 5 days
Outpatient clinic	Number of outpatient visits per patient: 3 Average duration of an outpatient clinic visit: 15 minutes

Variation in demand and impact on capacity utilisation

Influencing required demand per capacity category:

1. Reduction of % of clients using capacity category
2. Reduce average duration of use

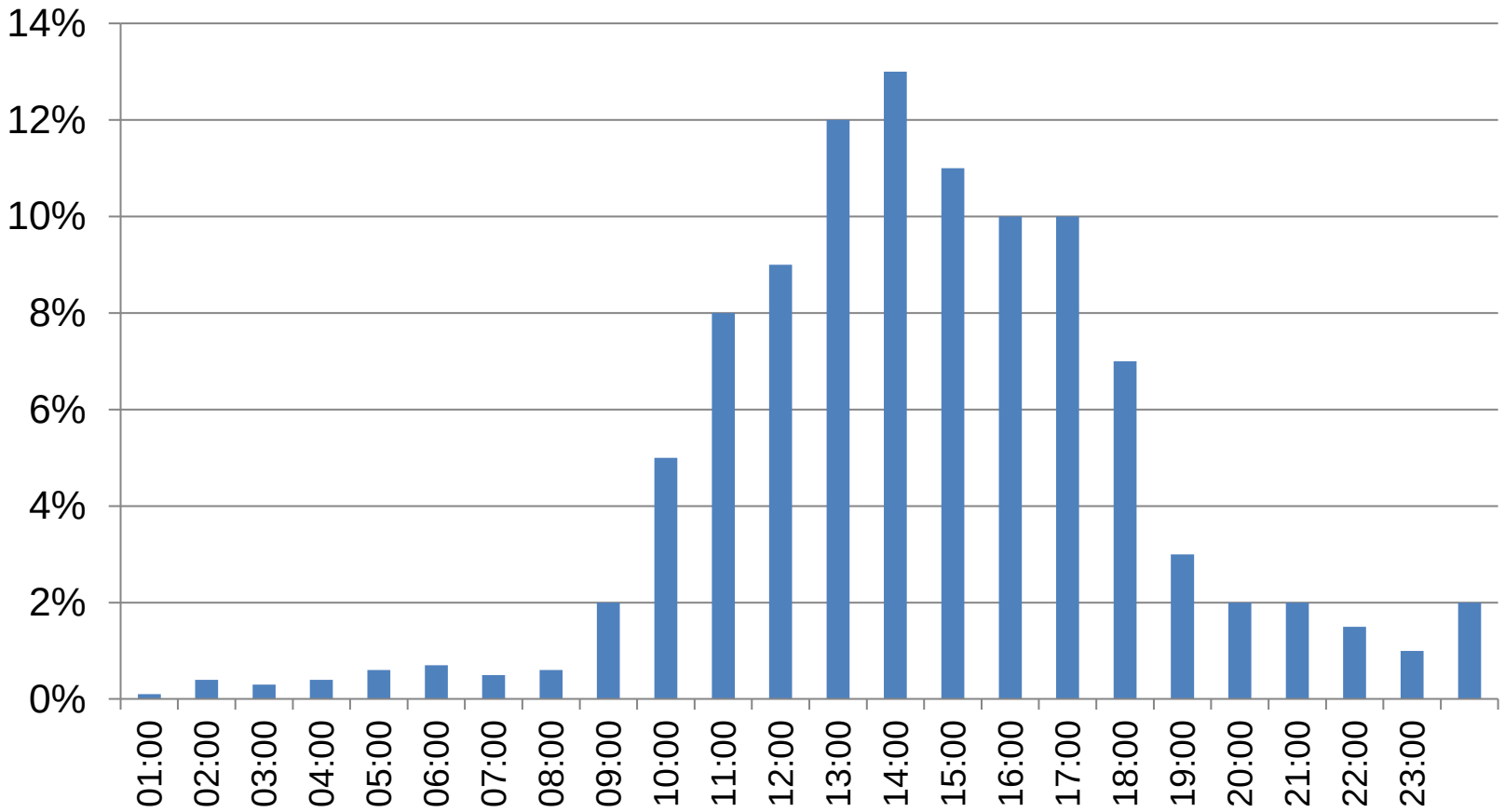
But how? And why not easy? What is the challenge?

Demand for capacity vs. required input per capacity category

Why difficult to match?

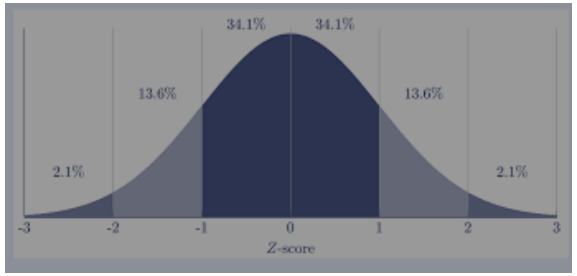
Source: *ageling.wordpress.com*

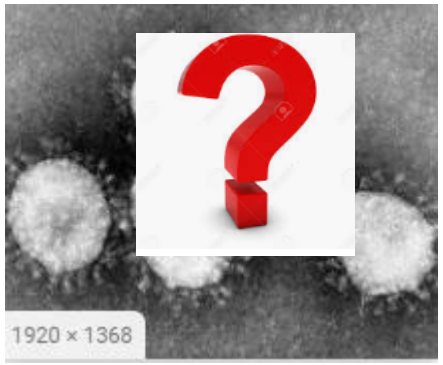
Main reason: variation



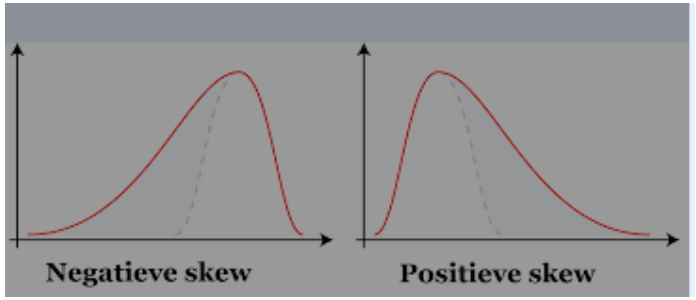
What causes variation in healthcare systems?

Natural variation and predictability





Non-natural variation and predictability



Effects of variation for the healthcare process

1. If patient flow constant ---> use of capacity category is constant

   Leads to good occupancy rate

2. If predictably of patient flow varies → variable use of capacity category

   Leads to good occupancy rate

3. If unpredictably fluctuating patient flow→ constant use of capacity type

   Leads to idle capacity

   Leads to waiting queue

Consequences of variation on healthcare process?

1. Effect on service

   Waiting time through queues

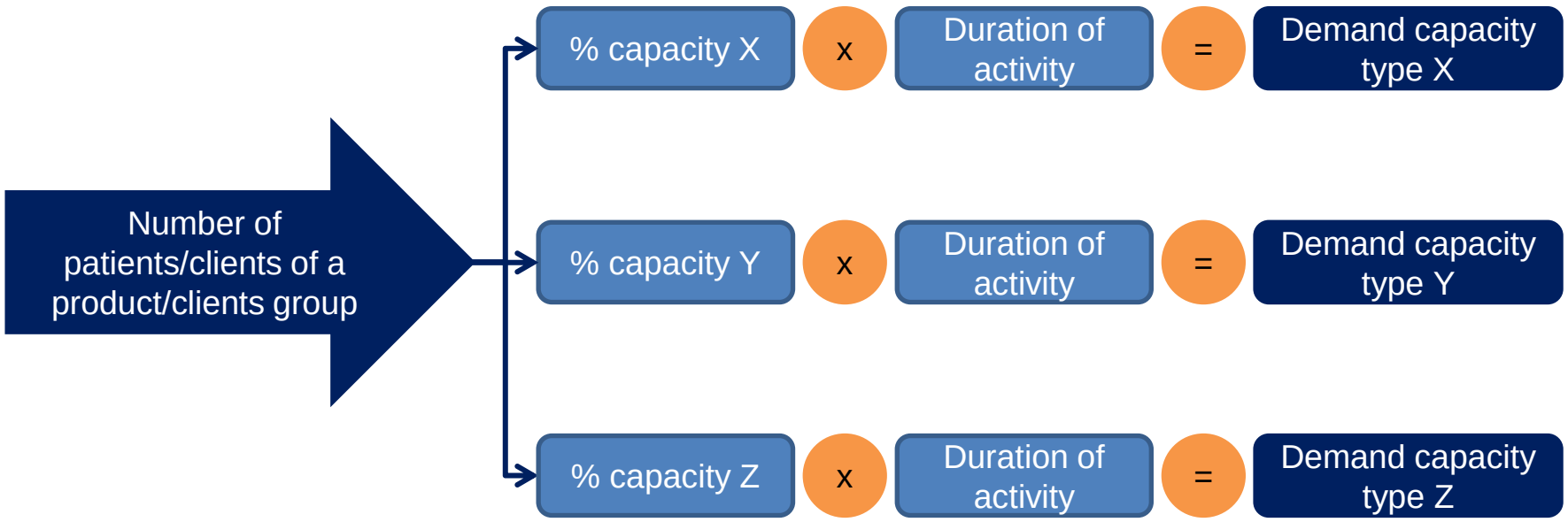
2. Effect on quality

   Increased risk of errors

3. Effect on costs

   High costs due to idle time and extra work

Summary: Where does variation in patients/client flow occur?



Class assignment

- Four roles
  - Nurse
  - Operating room planner
  - Seminar Doctor
  - CEO Hospital XYZ

Planning problem:
- 20 patients are scheduled for today (=full schedule)
- Planned doctor last minute decided to visit a seminar and can't be replaced
- Nurse doesn't agree on 20 patients, want to bring back this amount to 15 patients
- Policy of the hospital is to avoid resheduling of patients at any costs

Instruction:
1. Discuss this planning problem in a group of 4 (divide the roles and stick to your role).
2. You are in time pressure and must come with a solution!
3. The planner is charring the meeting.

4. Is able to reproduce relevant product knowledge in relation to resources common in Healthcare

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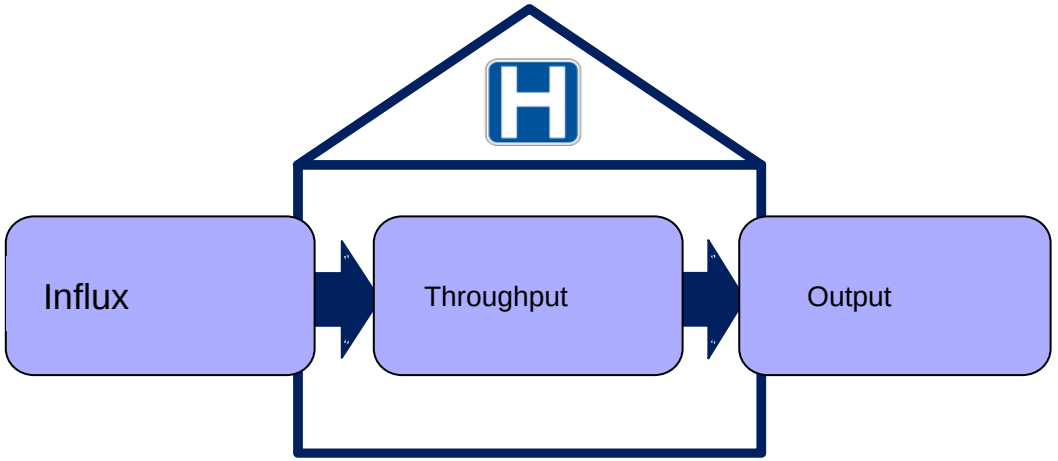
Waiting times

1. Access time : From the moment the demand for health starts till the patient is allowed to access the healthcare institute

2. Lead time: waiting time ‘in waiting room’ and treatment time



Requirements for access time?

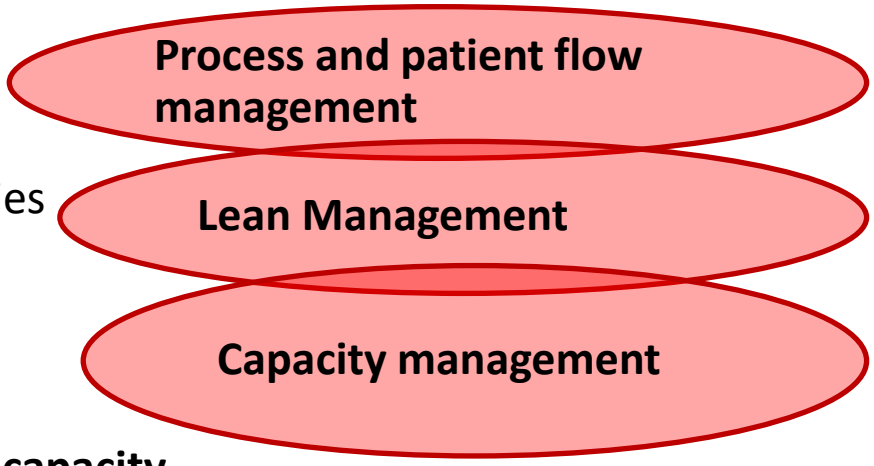
How to measure access time?

- Measure by samples
- Average is a good key indicator for access times

What to do in case of increasing access time?

1. To decrease the demand
   - To decrease the incoming patient flow
   - Redesign of the care process
   - To decrease the duration of the activities

2. To increase the supply
   - **To offer more capacity**
   - **To increase the usage of the available capacity**



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HELP – Healthcare Logistics Education and Learning Pathway

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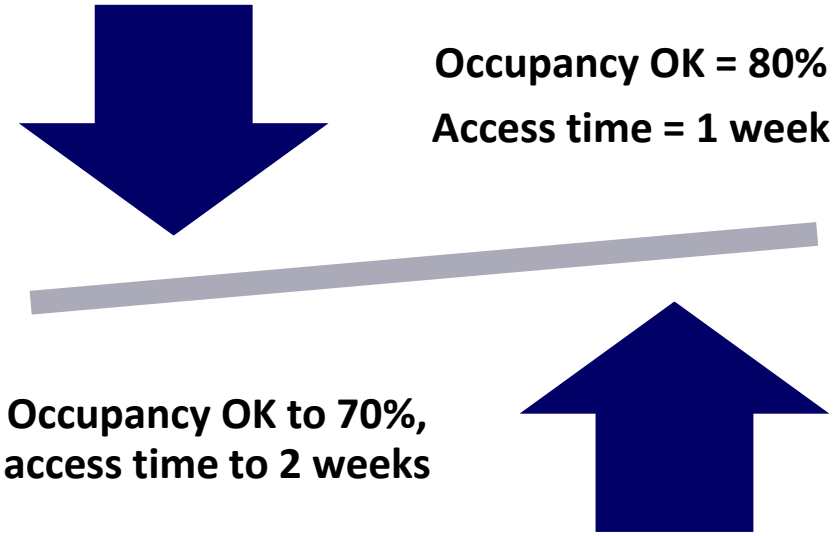
Usage of capacity and access time



Adjust objectives or increase capacity

Integrated capacity management

What is it and why is it getting more and more focus by healthcare institutions?

When healthcare institutions do not successfully manage capacity assets, they will suffer by way of revenue loss, delays, operational inefficiency and patient dissatisfaction. Efficient capacity management only can be built upon a foundation of accurate forecasting and timely scheduling (SHAHNAZ, 2015)

Class asignment (10 min):

1. *Search the internet for definitions on integrated capacity management in healthcare.*

2. *What good examples can you find about applying integrated capacity management in healthcare?*

Theory of Constrains (in brief)

Dice game

https://prideandjoy.worldsecuresystems.com/game1-video

Dice game

Lessons learned???

ToC in healthcare (Alex Knight)

https://www.youtube.com/watch?v=Ne0L0Ixp3_E

Integrated case study

Time line:

(1) Read the case

(2) If any, what questions do you have about the case? Write down

----------10 min

(3) Q&A

Example in the Netherlands

Erasmus MC

https://www.youtube.com/watch?v=GWbzXofBy5U

Literature

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2014 Vol. 4 (2) April-June, pp.515-521/Sharifi and Saberi

THANK YOU!

Now: start with reading and discussing integrated case

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