

# Operating room scheduling with downstream constraints (Sainte-Justine hospital)



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POLYTECHNIQUE  
MONTRÉAL

LE GÉNIE  
EN PREMIÈRE CLASSE



CHU Sainte-Justine

# Standard process for operating block scheduling

## 3 steps

### **Strategic** level

- How many hours of intervention will each specialty have?

### **Tactical** level

- Which surgeon is going to operate within each specialty?

### **Operational** level

- Which patients are going to be operated on and when?

Operative constraints

Postoperative constraints

# Operational level

3 specialties

Spe 1

Spe 2

Spe 3

	Monday	Tuesday	Wednesday	Thursday	Friday
Room 1	Surg. 1			Surg. 4	
Room 2		Surg. 3	Surg. 2	Surg. 5	Surg. 3

## Goal

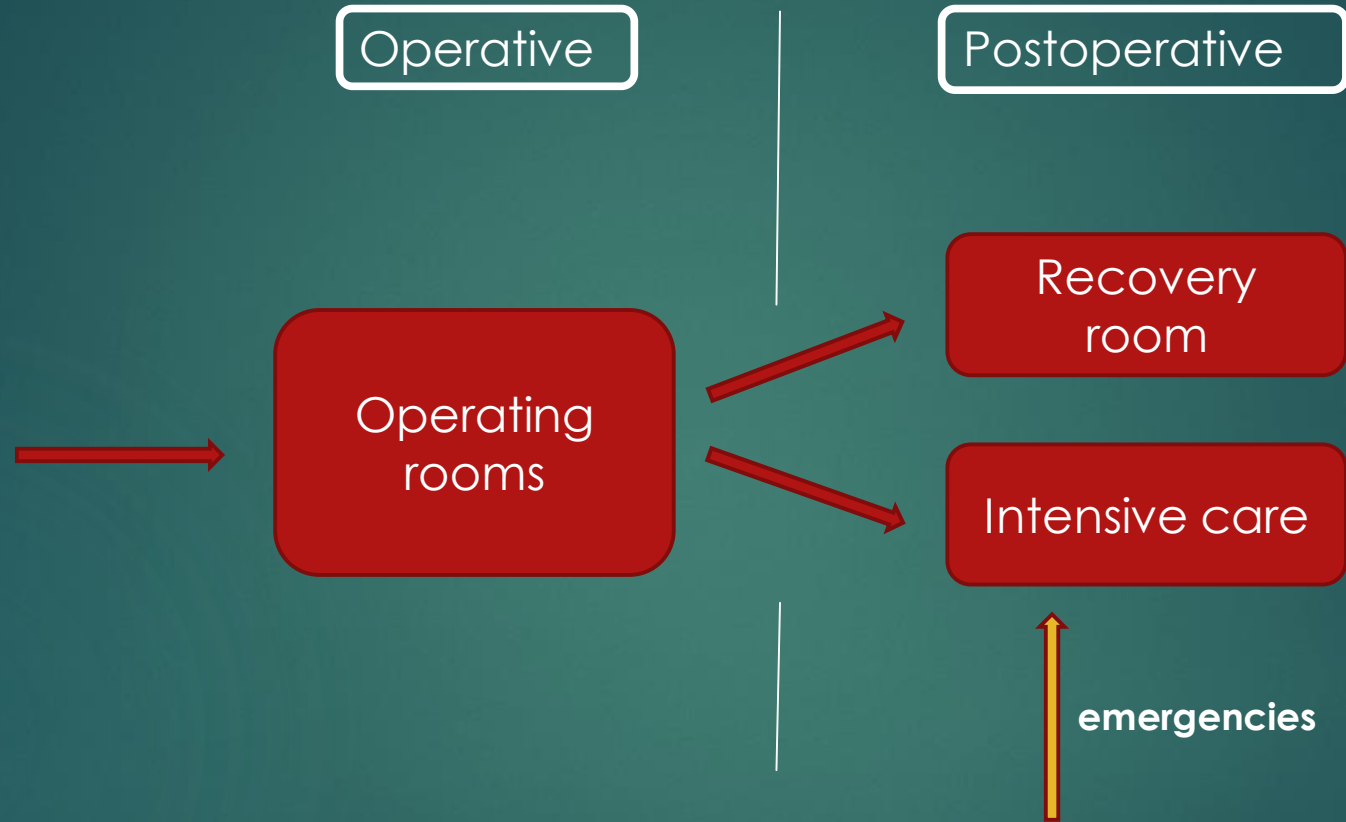
**Maximizing** the **occupation rate** of the rooms while prioritizing the patients who are waiting for **the longest time**

Surg. 2  
Waiting List

Operative constraints

Postoperative constraints

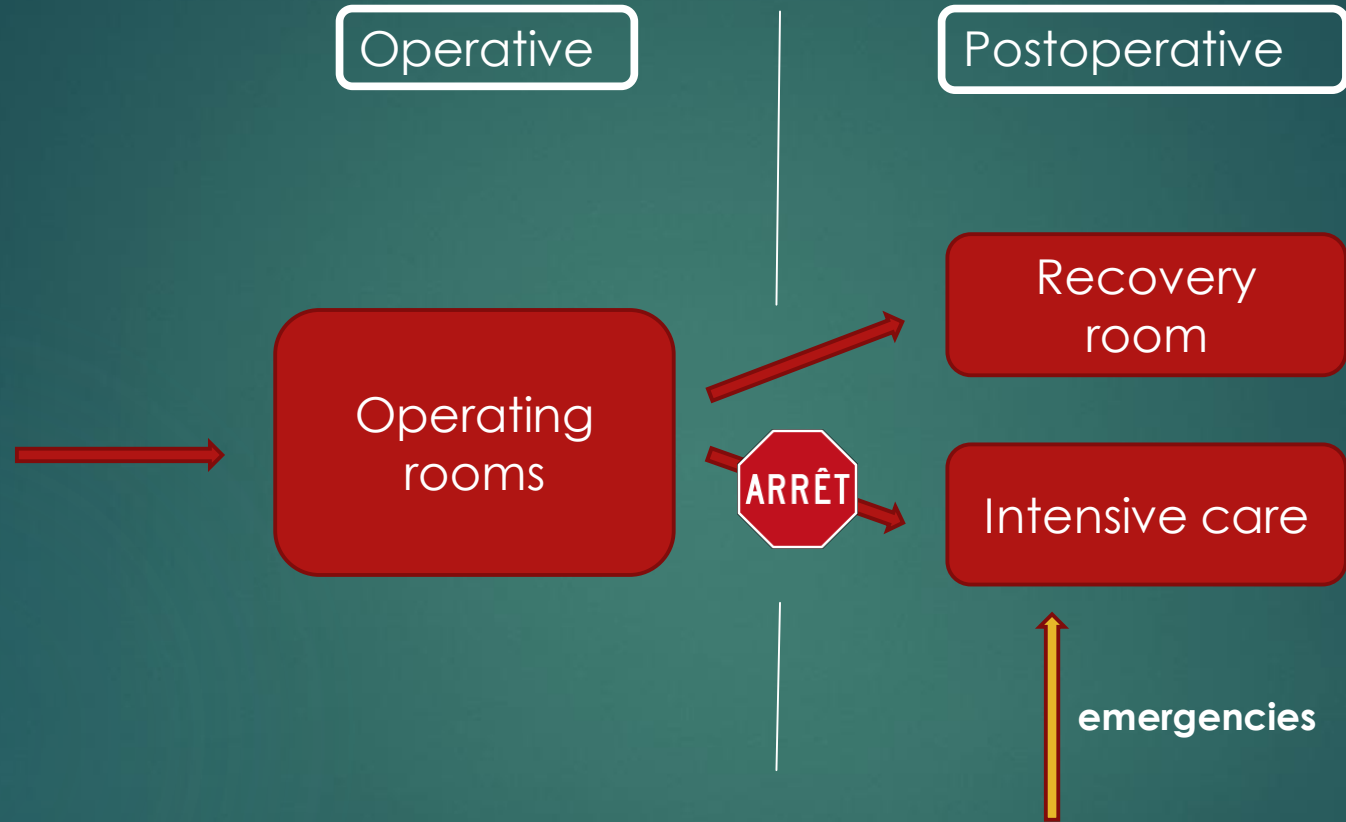
# Downstream constraints



Operative constraints

Postoperative constraints

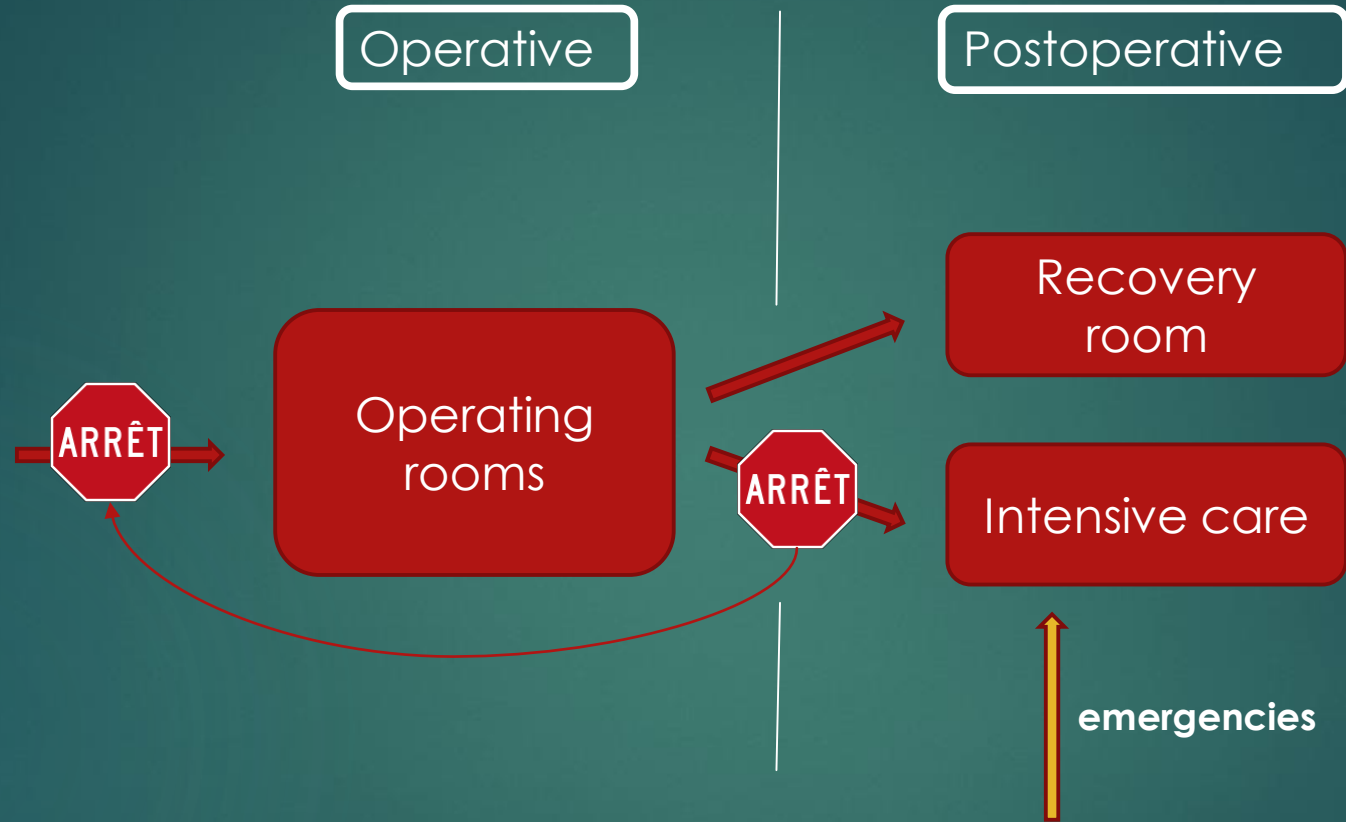
# Downstream constraints



Operative constraints

Postoperative constraints

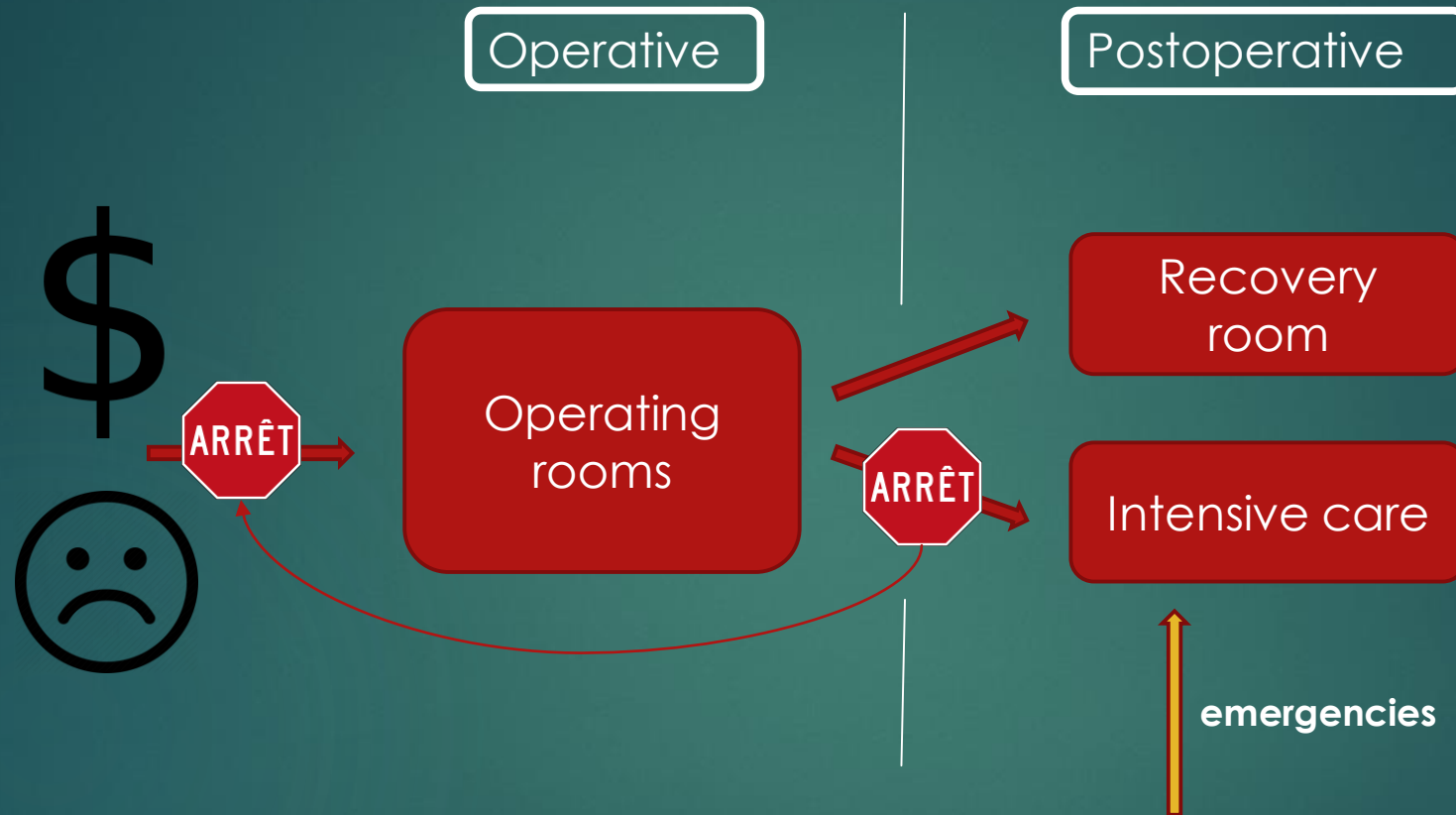
# Downstream constraints



Operative constraints

Postoperative constraints

# Ajout au modèle des contraintes post-opératoires



Operative constraints

Postoperative constraints

# Conclusion

- Goal : yield a schedule with an indicator about the probability of cancellation due to the ICU

## What we have

- Simple model of the operating rooms
- Faster than by hand and may give useful insights about which surgeons to schedule

## What we are working on

- Anticipate the cancellations to either reschedule or warn the patient
- The ICU concerns a very small fraction of the patients but is an important department