

COST ANALYSIS OF INTEGRATED OPERATING ROOM COMPARED TO CONVENTIONAL OPERATING ROOM

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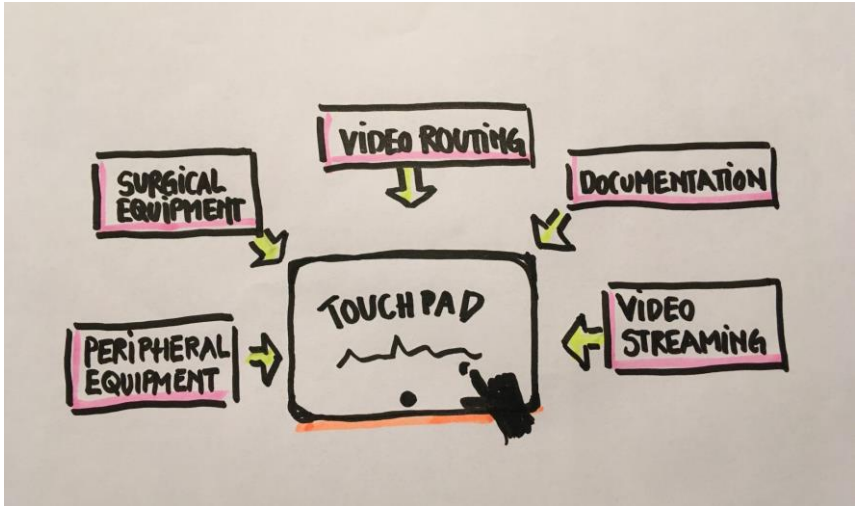
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Background

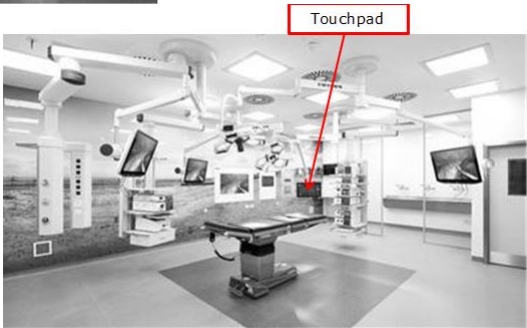
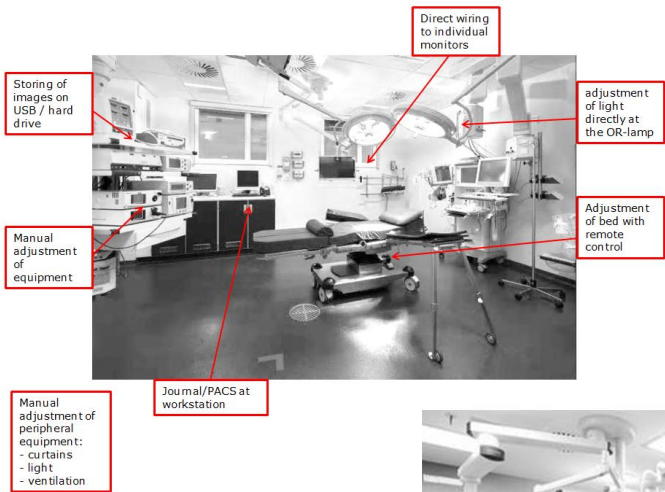


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Integrated Operating Room (IOR)



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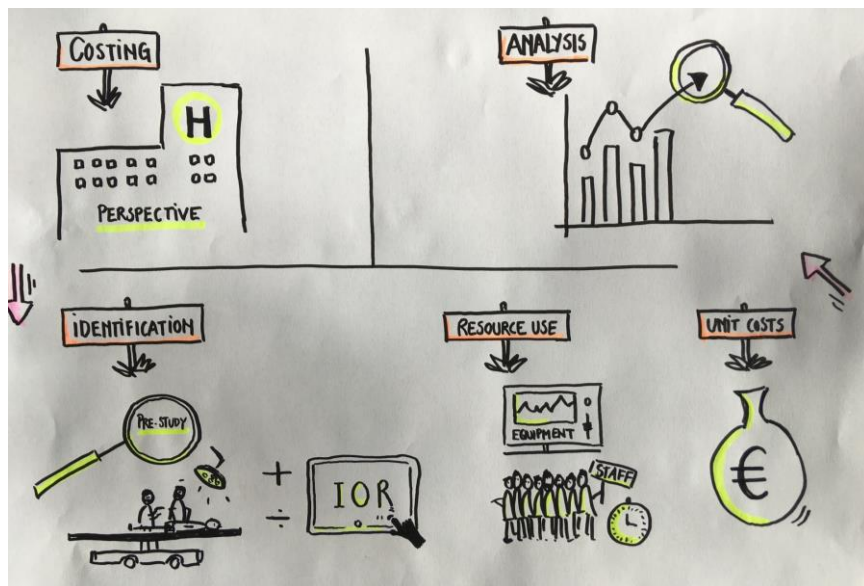
Objectives

- To compare costs and consequences of integrated operating rooms (IOR) compared to conventional operating rooms (COR)



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Methods

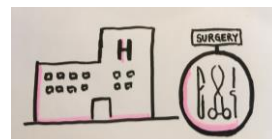


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Participating departments

Inclusion criteria:

- IOR **and** COR
- Comparable surgeries at both ORs
- Within the Central Denmark Region



Selected specifications of the departments	Department of heart, lung and vascular surgery	Department of gastrointestinal surgery
Full time employees	94	152
Annual number of surgeries ^a	1,267	2,627
Selected surgical unit	OR-East	OR-South 1
Total number of OR's in the surgical unit ^b	5	3
Total number of IOR's in the surgical unit	1	1
Specialty of selected types of surgery	Lung surgery	Gastrointestinal surgery
Selected types of surgery	Lobectomy	Lap. Cholecystectomy
	Esophageal resection	Lap. Appendectomy
	Pectus excavatum	
	Lung resection	
	Pectus carinatum	
Data extraction period	01.10.16 - 31.03.19	01.10.18 - 31.03.19
	32 months	6 months
OR = operating rooms a = Activity data is extracted for 2018 b = Including integrated operating rooms (IOR)		

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Data collection

- Surgical procedure: data were extracted from the hospital administrative system
- Following data points were registered:
 1. patient entering the OR
 2. first incision
 3. last suture
 4. patient leaves the OR
- Technology costs: estimated based on procurement data for the past 3 years at AUH.
 - The costs included were the purchase of various equipment and installation costs
 - Service and support costs



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Results

Staff cost (time consumption)

- 1,192 surgeries of the selected types were included.
- We found no statistically significant differences in preparation time, operating time, termination time or procedure time between IOR and COR



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Results

Technology costs (= Incremental costs)

	Integrated solution	Technology cost	Equivalent annual cost ^a
1		Integrated solution 1 Control of surgical lightning (peripheral equipment) 21.450 Control of surgical equipment 15.600 Video routing (incl. required equipment) ^b 45.500 Installation of the integrated operating room (60%) 7.800 Service/support by regional medico-technical staff 546 Total 90.350	 12.080
2		Integrated solution 2 Control of peripheral equipment ^a 40.950 Control of surgical equipment 15.600 Video routing (incl. required equipment) ^c 45.500 Documentation module 13.650 Installation of the integrated operating room (80%) 10.400 Service/support by regional medico-technical staff 546 Total 126.100	 16.469
3		Integrated solution 3 Control of peripheral equipment ^a 40.950 Control of surgical equipment 15.600 Video routing (incl. required equipment) ^c 45.500 Documentation module 13.650 Video streaming/conference 17.550 Installation of the integrated operating room (100%) 13.000 Service/support by regional medico-technical staff 546 Total 146.250	 19.417

All prices are stated in EURO

^a = The equivalent annual costs were calculated using an interest rate of 2 % and the estimated technical annuity of equipment (5-15 years)

^b = Based on Total Control of peripheral equipment (incl. ergonomic room lighting, surgical lighting and box to enable central control)

^c = Based on Lowest total Video Routing (incl. required equipment)

Results

Budget impact

Integrated solution	Unit cost IOR	Equiv. annual costs	Budget impact one hospital (AUH)		National budget impact (DK)	
			Total investment ^a	Equiv. annual costs ^a	Total investment ^b	Equiv. annual costs ^b
Integrated solution 1	90,350	12,080	5,421,000	724,815	69,569,500	8,938,430
Integrated solution 2	126,100	16,470	7,566,000	988,159	97,097,000	12,318,006
Integrated solution 3	146,250	19,417	8,775,000	1,165,000	112,612,500	14,587,473

All prices are stated in EURO
 IOR = Integrated operating room
 AUH = Aarhus University Hospital
 DK = Denmark
 a = In AUH the calculation is based on a total of 60 operating rooms
 b = The national calculation is based on a total of 770 operating rooms



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Conclusion



- The analysis of time registrations found no statistically significant differences in procedure time between IOR and COR
- The cost analysis revealed significant incremental costs of an IOR dependent on chosen solution
- Even though not detected in this assessment, effects or value of the IOR may be found over time
 - Fast conversion from laparoscopic to open surgery in acute situations
 - Extended use of teaching and collaborating possibilities due to video streaming might improve quality of treatment
 - Working environment and job satisfaction

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Context

- This cost minimization analysis was part of a Health Technology Assessment of Integrated Operating Rooms
- The HTA was initiated and funded in cooperation between the five Danish Regions



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Thank you for listening

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