ProcedurePak®
Value Report

Al Wakra Hospital (Qatar)

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1. Outcomes overview

Implementing ProcedurePak® trays into a hospital provides a great number of opportunities to optimize processes and thereby increase efficiency. This analysis shows a selection of the annual potential improvements for your hospital:

- Time saving: 647 hours in the O.R. material management process
- Waste reduced by 35.000 individual packages
- Waste reduction of 157,5 kg

There are also several other factors affected by implementing ProcedurePak® trays which were not included in this analysis. These are:

- Reduced contamination risk by handling/opening fewer packages
- Reduced picking errors and scrapping cost
- Increased quality and cost control due to simplified handling and logistics
- Simplifying invoicing and tracking processes of the products used for each surgery.

2. Analysis Method

In order to make financial statements regarding the use of ProcedurePak® trays, the underlying processes must be defined and assessed. In this analysis, this is done by using a process cost calculation model where the cost drivers can be identified and allocated to various cost carriers.

Process cost calculation[1] is a costing method that is based on **activity-based costing**. It represents the costs of indirect services (e.g. procurement, logistics, distribution) which allows overheads (e.g. costs for personell and infrastructure) to be allocated in proportion to demand. Direct costs are calculated for all relevant processes by correlative cost drivers (e.g. process time). For the all remaining processes the indirect costs are calculated by an overhead charge.

When a process cost calculation is started, the first step is to develop a process model and carry out a process analysis. This analysis identifies all activities of important processes in the hospital, and separates them from other processes. The formed sub-processes are allocated to cost centres and higher-level primary and business processes.

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[1] Horvath/Mayer (1989), Process Cost Calculation: The New Way to Greater Cost Transparency and More Effective Business Strategies, Controlling 1, p. 214-219

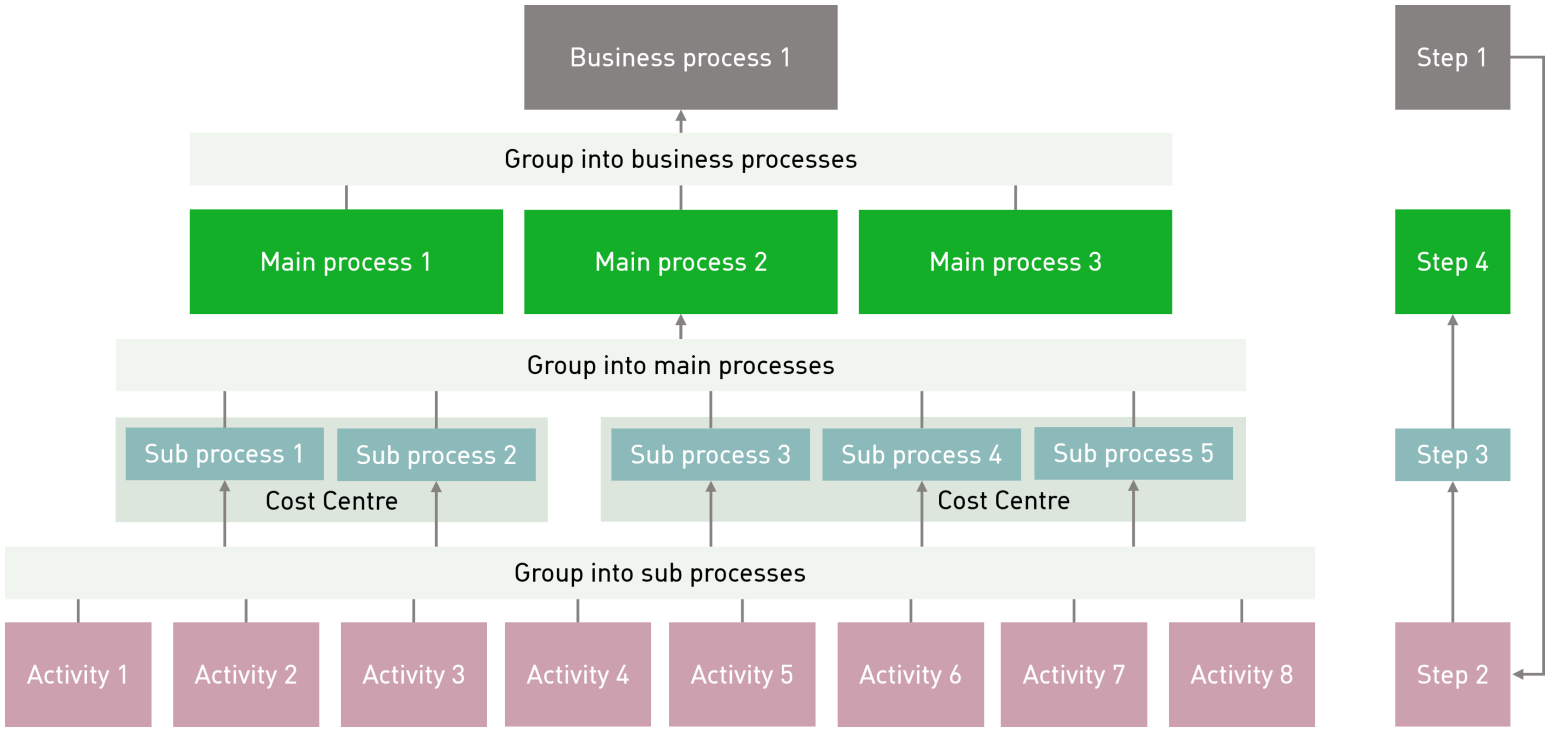

Diagram showing process model development, modified according to Greiling (2019), Workflow-Management Exzellenz-Modell, Band 2: Wege zur Effektivität, p. 29

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The business process “Materials Management in the Operating Theatre” consists overall of 6 primary processes, which are listed below.

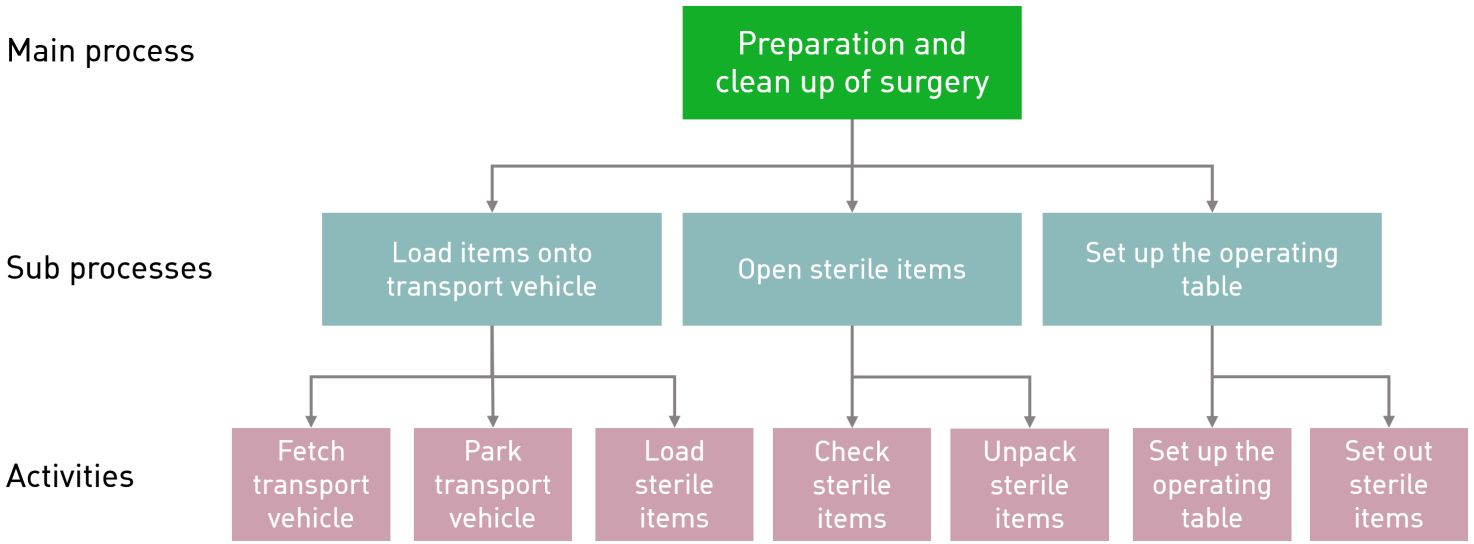
1.	Internal order and delivery	Purchase order processing between the ward and the hospitals purchasing, e.g. the order processing, consignment and unloading of the delivery.	12 sub-processes
2.	Receival of goods by the Operating Room	Incoming goods inspection at the ward, transportation of the goods to the O. R. stockroom and storing the goods.	5 sub-processes
3.	**Preparation and clean up of surgery**	**The sub-processes which are described in chapter 3. The reports calculation is mainly based on this primary process.**	**14 sub-processes**
4.	External order	Purchase order processing between the hospital purchasing department and external suppliers, e.g. entering orders into the ERP-system, order consignment and documentation.	5 sub-processes
5.	Receipt of goods via the Purchasing	Incoming goods inspection at the central warehouse and transportation of the goods to the hospital.	7 sub-processes
6.	Invoicing	Processing of the supplier invoices by the purchasing and financial accounting.	8 sub-processes

3. Scientific Basis and Assumptions

In analyzing the business process “Materials Management in the Operating Room”, the central primary process “Preparation and clean up of surgery” is examined below.

“Preparation and clean up of surgery” covers approximately 75 % of Materials Management in the Operating Room. The remaining five primary processes are added on the basis of empirical values, using the cost element percentage method and acceptance procedures. These subordinate data are therefore based on an already completed Europe-wide study commissioned by Mölnlycke Health Care and carried out in collaboration with the German Institute for Workflow Management in Health Care (IWiG Institut). To support the understanding of what exactlyis meant by the primary process “Preparation and clean up of surgery”, in particular regarding sub-processes and activities, and the structureof the process, a diagram of the structure is provided below.

The primary process “Preparation and clean up of surgery” consists of 14 sub-processes, which can be broken down into 33 activities. The occupational groups involved in this process are O.R. nurses and O.R. support staff.



Extract from the structure of the third primary process

Preparation and clean up of surgery (third primary process):

	Sub-process	Activitiy	Performed by
1	**Load goods onto transport vehicle**	1.1 Get transport vehicle 1.2 Park transport vehicle 1.3 Load goods	O.R. nurse 1
2	Transport goods to site[2]	2.1 Transport back to site	O.R. nurse 1
3	**Open sterile items**	3.1 Check sterile items 3.2 Unpack sterile items	O.R. nurse 1
4	**Dispose packaging**	4.1 Position waste bags 4.2 Throw away packaging	O.R. nurse 1
5	**Document information on materials**	5.1 Find information on materials 5.2 Monitor information on materials 5.3 Accept information on materials 5.4 Document information on materials 5.5 File information on materials	O.R. nurse 1
6	Throw away disposable materials (after surgery)[2]	6.1 Position waste bags 6.2 Throw away disposable materials	O.R. nurse 1
7	Receive sterile items[2]	7.2 Receive items 7.2 Set out items	O.R. nurse 2
8	Set up the operating table[2]	8.1 Set up the operating table 8.2 Set out sterile items	O.R. nurse 2
9	Prepare sterile items for next use (after surgery)[3]	9.1 Sort sterile items 9.2 Clean sterile items (first cleaning) 9.3 Set out sterile items	O.R. nurse 1
10	Open waste bags[3]	10.1 Open waste bags 10.2 Close waste bags 10.3 Load waste bags	O.R. support
11	Transport waste bags to site[3]	11.1 Transport back to site	O.R. support
12	Leave rubbish sacks at rubbish disposal area[3]	12.1 Open waste disposal room/area 12.2 Leave waste bags	O.R. support
13	Transport rubbish sacks to site[3]	13.1 Transport back to site	O.R. support
14	Dispose waste bags in skips[3]	14.1 Open container 14.2 Collect waste bags 14.3 Dispose of waste bags	O.R. support

[2] Process times with and without ProcedurePak® trays are the same for these sub-processes.

[3] Sub-processes are not part of the calculation.

4. Client Information

The following analysis is related to the customer-specific information below.

Customer name:	Al Wakra Hospital (Qatar)
Customer address:	Wukair Street Doha
Hospital contact persons involved in the project (name, position):	Khaled Ezzat, Business Manager
Total surgeries/year:	ca. 1 surgeries

According to information provided by the hospital O.R. contacts, using ProcedurePak® trays in your hospital should achieve the following specific goals:

- Increase the number of procedures, greater utilisation of the O.R. capacity
- Improving ways of working, reducing risk for both staff and patients
- Leaner and more transparent processes, allowing all professional groups to focus on their key tasks
- Reduce overtime across departments with main impact in O.R.
- Optimise stocks
- Simplify supplies to the O.R. (ordering - deliveries)
- Less waste in the O.R.
- Reduce risk of picking errors when preparing for surgery
- Less time spent on invoicing
- Cost control per intervention

5. Analysis of potential

5.1 Time savings

5.1.1 Overview

ProcedurePak®	Trays per year	Total number of packages for the intervention	Packages remaining as a single pack	Packages included in the tray
C-Section	2500	24	9	15

5.1.2 Time saving per intervention

5.1.2.1 C-Section

No. of ProcedurePak® trays per year:	2.500 trays
Number of packages that needed to be opened before using the tray	24
Number of remaining packages with this tray	9
Number of packages included in the tray	15

Without tray	1267 h 58 min
With tray	782 h 38 min
Savings*	485 h 20 min
Savings per tray	**11 min**
Savings	**38,3 %**

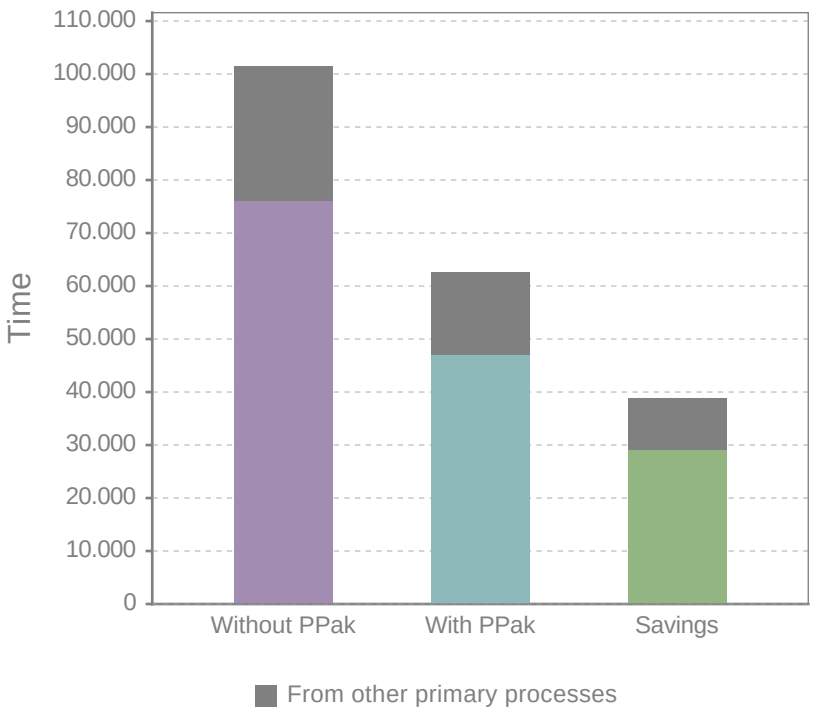
Time comparison for the third primary process (preparation and clean up of surgery), with and without ProcedurePak® trays (times in minutes).

The time saving shown here corresponds to 485 hours.

* Sum of time expenditure of work of OR-nurses in the third main process (not equal with potential changing time reduction)

5.1.3 Total time saving for all involved surgeries

Total time savings with and without ProcedurePak®



No. of ProcedurePak® trays:	1 trays
Annual consumption:	2.500 trays

This analysis is based on a total of **1 different tray/s**, with a **total yearly consumption of 2.500 trays**. The surgical trays in scope replace a total of **35.000 packages**. By implementing ProcedurePak® trays, processes can be simplified, and a total of **38.827 minutes** can be saved.
This corresponds to a potential equivalent time saving of **647 hours**, or **38,3 %** for the whole process, from order to disposal of the item after use.[4]

[4] 75 % of the time saving potential results from the primary process "preparation and clean up of surgery". The remaining 25 % is based on the theoretical assumption of taking the remaining five primary processes into account which also yield further time savings, but not as much as in the third primary process.

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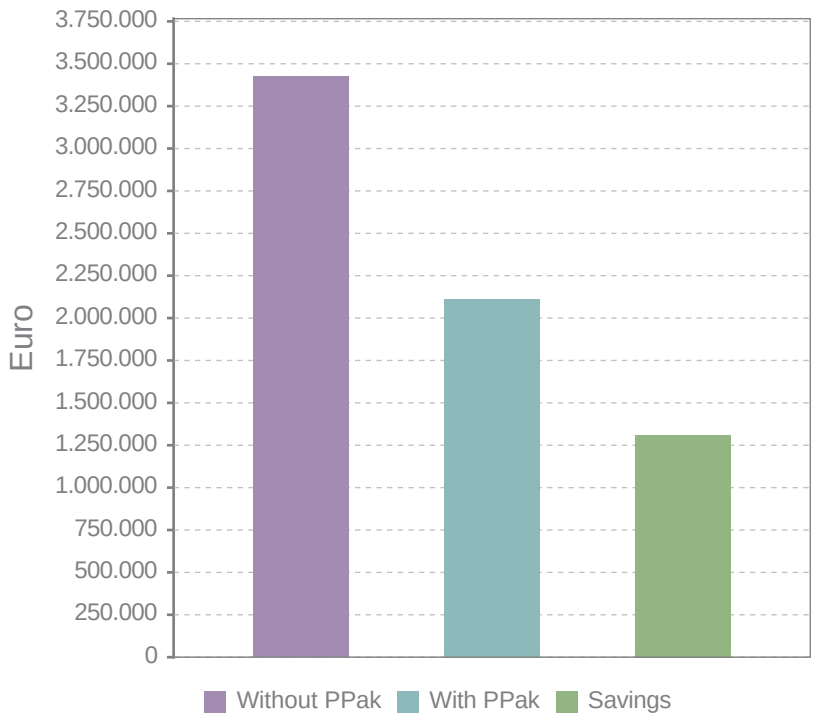
5.1.4 Monetary evaluation of time saved for all impacted surgeries

Monetary evaluation with and without ProcedurePak®



Before use of ProcedurePak® trays:	3.423.488 EUR
When ProcedurePak® trays are used:	2.113.088 EUR
Monetary Evaluation of the time saved:	1.310.400 EUR

The average gross O.R. cost rate of **45 EUR/min** represents the full-time employee staff cost in the O.R. and the overhead addition rate for the medical infrastructure.

The time saving is equivalent to a value of **1.310.400 EUR** thanks to the introduction of ProcedurePak® trays listed in the Appendix due to potential process optimization.[5]

[5] It should be noted that the ratio given here between staff cost savings and overhead savings is based on theoretical assumptions.

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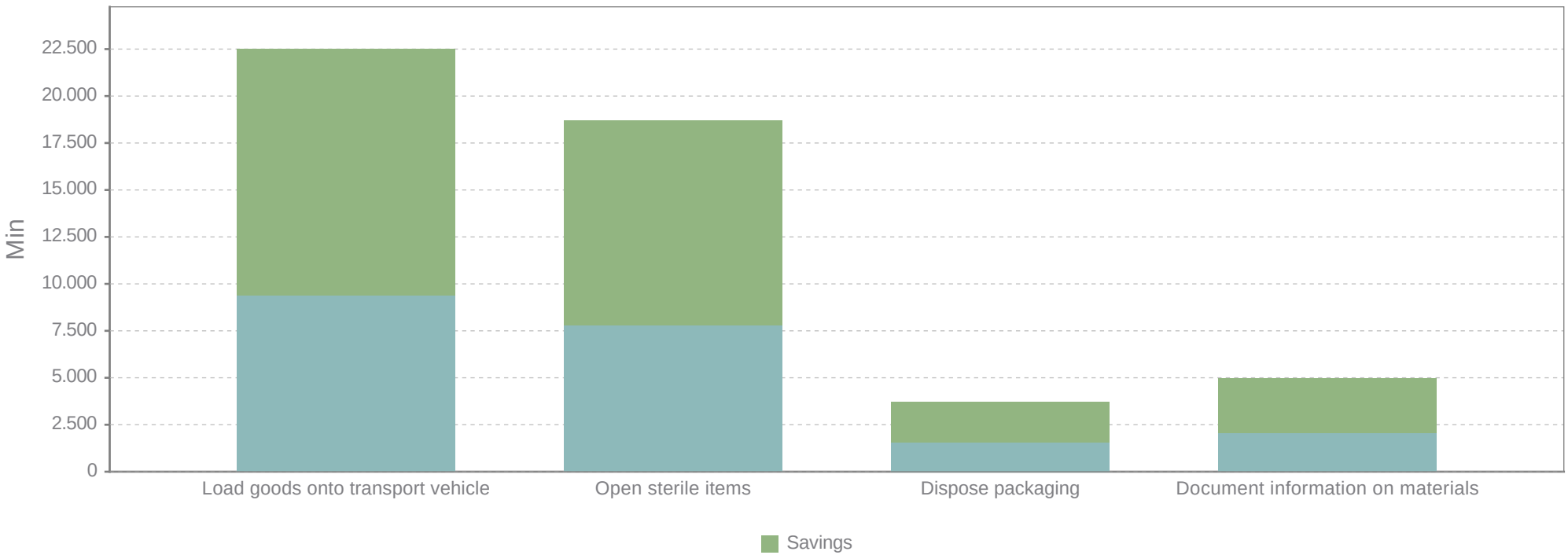
5.1.5 Time savings across all processes impacted



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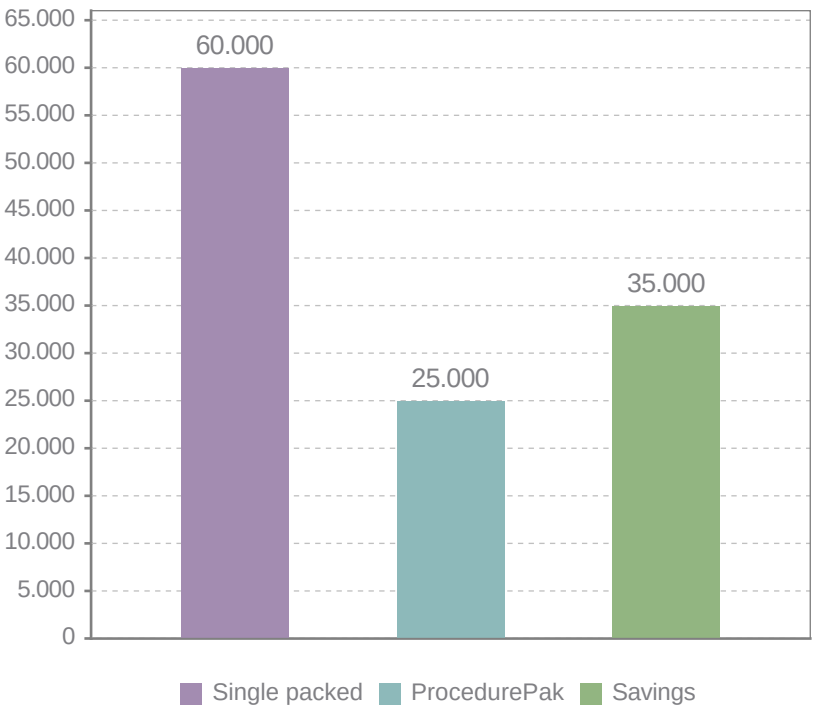
Process	Without tray	With tray	Savings in min.	Average savings per tray
Load goods onto transport vehicle	375 h	156 h 15 min	218 h 45 min	5 min
Open sterile items	312 h	130 h	182 h	4 min
Dispose packaging	62 h	25 h 50 min	36 h 10 min	1 min
Document information on materials	83 h	34 h 35 min	48 h 25 min	1 min

5.2 Process implications when implementing ProcedurePak® trays

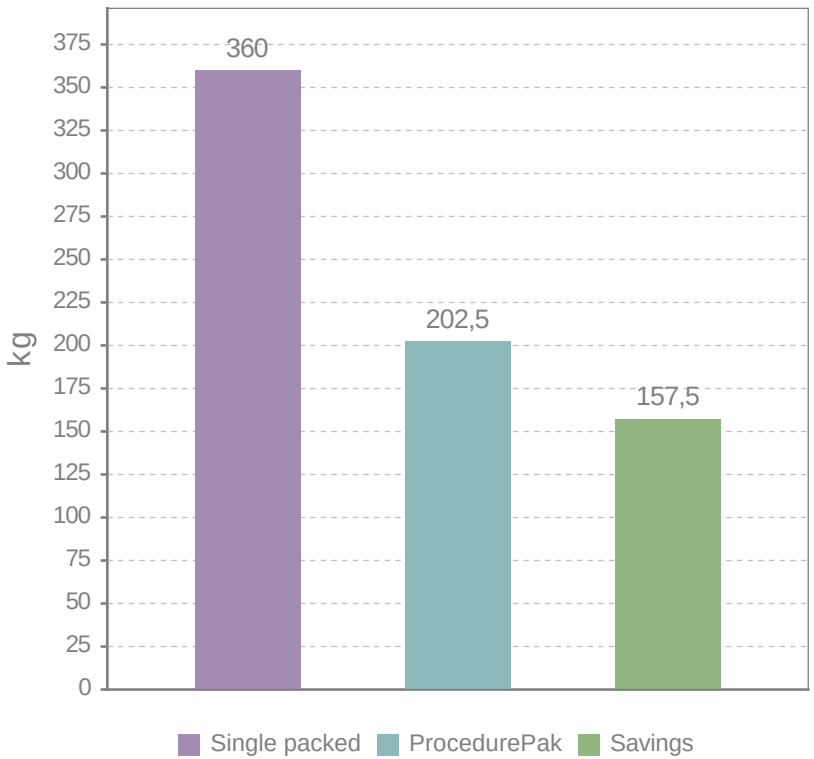
5.2.1 Reduction in individual packages



The reduction of single packed items leads to a reduction in the waste of packages in the O.R. An overview of the specific ProcedurePak® trays yields the following **environmental optimization** potential:

The number of individual packages can be reduced by **58 %**, from initially **60.000 per year** to **25.000** thanks to the introduction of ProcedurePak® trays.

5.2.2 Reduction in package waste per year



Packing single use items in one surgical tray provides a corresponding waste reduction of **158 kg**. This waste reduction is based on a study[6] and could be valued separately using hospital-specific input.

[6] Numbers based on "Assessing the carbon and waste benefits of moving to procedure packs at Royal Liverpool and Broadgreen University Hospitals NHS Trust." by Mark Shayler (under the assumption of 6 g packing weight per package in the simple item supply model and 1.8 g packing weight per package in the ProcedurePak® supply model).

6. Contact persons at Mölnlycke

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