



Research Article

# Innovative Packaging Solutions for the Galaxy II Male Kit: Improving Safety and Efficiency in Surgical Operations

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## Abstract

The Galaxy II Male Kit is an award-winning surgical retractor designed for male pelvic surgery and claims to be a game change in the field of surgical retractor technique. Featuring innovative camlocks to improve ease of use and reduced material thanks to modern manufacturing and improved materials, the Galaxy II retractor range was awarded HRH The Queen's Award For Innovation in 2021. This case study describes the deployment of an innovative eco-friendly packaging design that minimizes both material use and operational inefficiencies. The measurements show an improvement of 72% in operating room time spent on unwrapping the kit and -74% in delivered volume of packaging materials. These redesigns improve sustainability of medical procedures performed and as well as the efficiency of working processes in the operating theatre.

## Introduction

The expectation of consumers is increasing for efficient, easy to use and eco-friendly solutions so that medical devices continue to advance accordingly [1]. To meet these requirements during male pelvic surgical procedures such as penile implants, a self-retaining surgical retractor kit called 'Galaxy II' was created. The kit is manufactured according to the guidelines given by eminent urologists and has several unique & innovative features designed to improve surgical & patient safety. The transition to eco-friendly packaging aligns with the growing demand for sustainable practices in healthcare, as evidenced by recent studies indicating a positive consumer attitude towards environmentally friendly packaging [2-4]. This case study highlights the Galaxy II packaging and specifically the primary aim of reducing the environmental footprint resulting from production processes and enhancing efficiency in surgery.

## Product Overview

The Galaxy II Male Kit (SKU JUNEGX-2020) specifically caters to procedural requirements related to male pelvic health. The kit includes:

- **Snowman Frame:** Unique design using camlocks instead of screws to securely fasten and easily adjust the frame. Light weight, yet strong and reliable.
- **6x 12 mm Blunt Hooks:** Large blunt hooks used to retract delicate or solid tissue.
- **2x 3 Finger Claws:** Blunt 3 Finger Claws designed to grasp more tissue.
- **2x Double 7mm Sharp Hooks and 1x 5mm Sharp Hook:** Sharp hooks available as single or double components to be used in the retraction of delicate or solid tissue.
- **Catheter Clip:** Ensures that all catheters are securely fixed on the frame during the surgical operation.
- **Innovative Penile Hammock:** Gently and effectively holds male anatomy in place with a reduced risk of injury..

The Galaxy II has won awards due to its unique design where you can use just one hand to carry out adjustments as it has cam locks replacing screws. Its modern production contributes to lighter weight and more efficient cut downs of wastage.

## Methodology

The effectiveness of the new packaging was evaluated by directly comparing the original packaging of the Galaxy II Male Kit (SKU JUNEGX-2020) with the new eco-friendly version (SKU JUNEGX-2023), which will be launched in 2025. The evaluation took place on October 9th, 2024, examining the following criteria:

- Each component of the kit was weighed individually using a digital scale calibrated for accuracy, including the outer box and accessories.
- Replication of the unwrapping process used in operating rooms was conducted. The process was timed, from opening the outer packaging to inspecting all sterile pouches.
- Both versions of the kit were analyzed in terms of the number and mass of sterile pouches, focusing on the differences in packaging weight and the time required for unwrapping.

Basic statistical methods were applied to evaluate the significance of improvements in efficiency and sustainability, based on the changes observed in packaging weight and unwrapping time.

## Results

The changes that occurred as a result of the testing with the different components are combined in the Table below:

Item	JUNEGX-2020	JUNEGX-2023	Reduction	Reduction %
Outer box	153 gr	153 gr	-	-
Galaxy Male Kit	195 gr	169 gr	26 gr	13%
Galaxy II Outer Box plus Kit (Sellable Unit)	348 gr	322 gr	26 gr	8%
Accessories Including Packaging	62 gr	36 gr	26 gr	42%
Accessories Packaging Only	35 gr	9 gr	26 gr	74%
Number of Sterile Pouches	17	4	13	76%
Unpacking Time	2 min 32 sec	42.06 sec	1 min 50 sec	72%

A notable decrease in total unpacking time and the amount of packaging materials has been reported. In particular, unpacking time took on average 2 minutes and 32 seconds and now after the improvement it only takes 42 seconds which is impressive since it shows a change of 72 percent. Moreover, the number of sterile pouches has been decreased from seventeen to four leading to a decrease in weight of the packaging materials from thirty five grams to nine grams. In general however, the weight of the Galaxy II Male Kit compromised of 348 grams was reduced to 322 grams meaning an eight percent reduction in the weight of the sellable units [5,6].

## Discussion

The switch to environmentally friendly packaging is one step towards conserving the environment and maximizing performance in the OR. Since there was an appreciable reduction of the time that was needed to unpack, this leads to future workflow improvement and cost of surgical procedures which may have the potential to be lowered as when there is a time shortage in preparing for an activity, resources may be used more efficiently [7,8]. Also, people

need to know that less packaging material is also beneficial as it helps in achieving sustainability targets that healthcare institutions focus on in recent years [9]. The eco-friendly packaging project goes hand in hand with the innovative features of the Galaxy II kit, including single-handed adjustments and new materials that received awards. Such a product-oriented approach to design and its subsequent influence on sustainability of the brand will be valuable to consumers as evidenced by research on environmental attributes in consumer behavior model [10].

It confirms the findings of the research conducted to understand the impact of environmental concern on purchasing decisions, suggesting that new Galaxy II Male Kit SKU JUNEGX-2023 is more sustainable. Use of shrouds in auxiliary equipment designed for one modality has reduced by over seventy percent which is really significant. This is essential in today's world where interdisciplinary models of healthcare are very aware of sustainability measures [11].

In addition, the Galaxy II Male Eco Kit decreases surgical preparation by almost two minutes per case which leads to operating

room efficiency. Seventy-two percent of time is wasted due to the increased levels of unpacking. The reduction in packaging not only improves the work order, it gives dominance to surgical teams focusing on patient care instead of long cases of preparations. Optimized packaging in surgical kits can lead to significant reductions in preparation time and overall waste, enhancing the efficiency of the surgical process. This supports the claims of improved efficiency and reduced packaging material as identified [12] is achieved by the Galaxy II Male Eco Kit. Furthermore, the new packaging solution decreases the number of sterile pouches from 17 to 4, achieving a staggering 76% reduction in overall packaging waste. This is beneficial not only to the manufacturing stage but also the use and the disposal stages of the product life cycle. Reducing the use of disposable packaging materials can significantly cut down on waste production in operating rooms, which aligns with the improvements seen in the Galaxy II Male Kit [13,14].

### Conclusion

This is the first presentation of the Galaxy II Male Eco Kit, SKU JUNEGX-2023. It comes with new art of the male kit which also positively alters the subject of the surgical device market in general. The kit not only enhances the user's performance and satisfaction, but also helps ease the environmental problems that are a concern by cutting down on packaging materials and time taken to unpack the kit. As the world of healthcare continues to grow, it will be essential for sustainable practices to be meshed with innovative medical technologies to advance patient care while reducing impact on the environment. The Galaxy II Male Eco Kit will outline the road for further development concerning the medical devices market.

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