

# A Data-Driven Solution for Patient Safety and Regulatory Compliance with a Novel Active Mattress System



## Introduction

Pressure ulcers are a common issue in healthcare, but they are largely preventable with proper repositioning and the use of active pressure-relieving mattresses (1,2). Despite best efforts, around 700,000 people in the UK still suffer from pressure ulcers each year (3), highlighting challenges in consistently adhering to repositioning schedules or using mattresses effectively.

This is where the Vestims Auto 8955a active mattress system plays a vital role, not only in protecting patients but also in supporting carers and care homes. By providing clear, objective data on mattress use and repositioning, this system defends care providers, demonstrating their commitment to high-quality care and helping to reduce pressure ulcer occurrences. In turn, it also supports regulatory compliance and offers peace of mind to carers and care facilities by ensuring adherence to best practices.

## Methods

A case study was conducted to evaluate repositioning compliance and the functionality of the Vestims Auto 8955a active mattress system. This system, which has previously been shown to improve resting blood flow by 336% (P=0.026) (2), records both manual and automatic operations, including repositioning events, power status, and low-pressure alerts. In a simulated scenario, a mannequin weighing 75kg was placed on the mattress, with the autofirm repositioning mode activated every two hours. The system's pump automatically logged all operational data, including repositioning events and alerts, and created a History of Use (HUS) report. This report could be accessed and exported for detailed analysis, making it easy for carers to monitor mattress performance and patient care over time.

## References

1. European Pressure Ulcer Advisory Panel (EPUAP), National Pressure Injury Advisory Panel (NPIAP), and Pan Pacific Pressure Injury Alliance (PPPIA). (2019) Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline. [Online] Available at: <https://www.epuap.org/guidelines/> (Accessed: 28 September 2024).
2. Baker, G., Bloxham, S., Laden, J. and Gush, R. (2019) 'Vascular endothelial function is improved after active mattress use', Journal of Wound Care, 28(10), pp. 676-682. doi: 10.12968/jowc.2019.28.10.676.
3. NHS England. (n.d.) Stop the Pressure. [Online] Available at: <https://www.england.nhs.uk/blog/stop-the-pressure> (Accessed: 28 September 2024).
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COI. This case study was conducted by the Director of Squirrel Medical Ltd, the manufacturer of the Vestims Auto 8955a active mattress. The research did not receive any external funding, and the authors declare no conflicts of interest related to this study.'

## Results

The data collected by the HUS report (Figure 1) accurately captured all repositioning and mattress events, providing evidence that the system supports adherence to repositioning protocols.

This ensures patient safety while also offering crucial documentation that can defend care providers in the event of legal challenges.

### Discussion - For Patient Protection and Carer Support

The HUS report provides a detailed and real-time overview of care, demonstrating that repositioning schedules are being met and that the mattress is functioning optimally. This proactive approach minimizes the risk of pressure ulcers and allows care teams to intervene early if any gaps in care are identified.

### Peace of Mind for Care Providers

The system supports carers and care homes by providing:

**Automatic Weight Adjustments:** The mattress system automatically adjusts to a patient's weight, eliminating the need for manual settings. This reduces the risk of human error and ensures that optimal mattress settings are maintained, improving patient outcomes.

**Data-Driven Legal Defense:** The system tracks and logs all relevant data, including time-stamped repositioning events and mattress functionality. This information acts as evidence in the event of a legal dispute, defending carers and care providers by showing adherence to patient care protocols.

## Example Download



Event	Date & Time (UK GMT)	Event	Date & Time (UK GMT)
53 Power On	7/6/2024 11:4 38	92 Autofirm Repositioning Mode-On	10/6/2024 17:7 48
54 Control Panel-Locked	7/6/2024 11:5 43	93 Control Panel-Locked	10/6/2024 17:8 48
55 Alternating Mode-On	7/6/2024 11:51 11	94 Control Panel-Unlocked	10/6/2024 17:17 46
56 Level 1	7/6/2024 11:51 11	95 Alternating Mode-On	10/6/2024 17:17 47
57 Ready For Use	7/6/2024 11:51 11	96 Control Panel-Locked	10/6/2024 17:18 46
58 Level 2	7/6/2024 12:34 32	97 Control Panel-Unlocked	11/6/2024 7:7 58
59 Ready For Use	7/6/2024 12:34 32	98 Control Panel-Locked	11/6/2024 7:8 36
60 Alternating Mode-On	7/6/2024 12:34 32	99 Control Panel-Unlocked	11/6/2024 7:8 40
61 Control Panel-Unlocked	10/6/2024 7:6 46	100 Autofirm Repositioning Mode-On	11/6/2024 7:9 56
62 Autofirm Repositioning Mode-On	10/6/2024 7:6 53	101 Control Panel-Locked	11/6/2024 7:10 56
63 Control Panel-Locked	10/6/2024 7:7 52	102 Autofirm Mode-Auto Off	11/6/2024 7:30 0
64 Control Panel-Unlocked	10/6/2024 7:17 51	103 Alternating Mode-On	11/6/2024 7:30 0
65 Alternating Mode-On	10/6/2024 7:17 53	104 Control Panel-Unlocked	11/6/2024 9:7 55
66 Control Panel-Locked	10/6/2024 7:18 53	105 Autofirm Repositioning Mode-On	11/6/2024 9:7 56
67 Control Panel-Unlocked	10/6/2024 9:6 53	106 Control Panel-Locked	11/6/2024 9:8 56
68 Autofirm Repositioning Mode-On	10/6/2024 9:7 11	107 Autofirm Mode-Auto Off	11/6/2024 9:28 29
69 Control Panel-Locked	10/6/2024 9:8 10	108 Alternating Mode-On	11/6/2024 9:28 29
70 Control Panel-Unlocked	10/6/2024 9:17 49	109 Control Panel-Unlocked	11/6/2024 11:7 37
71 Alternating Mode-On	10/6/2024 9:17 51	110 Autofirm Repositioning Mode-On	11/6/2024 11:7 38
72 Control Panel-Locked	10/6/2024 9:18 50	111 Control Panel-Locked	11/6/2024 11:8 37
73 Control Panel-Unlocked	10/6/2024 11:6 45	112 Autofirm Mode-Auto Off	11/6/2024 11:28 12
74 Autofirm Repositioning Mode-On	10/6/2024 11:6 47	113 Alternating Mode-On	11/6/2024 11:28 12
75 Control Panel-Locked	10/6/2024 11:7 46	114 Control Panel-Unlocked	11/6/2024 13:7 5
76 Control Panel-Unlocked	10/6/2024 11:17 46	115 Autofirm Repositioning Mode-On	11/6/2024 13:7 6
77 Alternating Mode-On	10/6/2024 11:17 47	116 Control Panel-Locked	11/6/2024 13:8 6
78 Control Panel-Locked	10/6/2024 11:18 46	117 Alternating Mode-On	11/6/2024 13:27 31
79 Control Panel-Unlocked	10/6/2024 13:7 26	118 Autofirm Mode-Auto Off	11/6/2024 13:27 31
80 Autofirm Repositioning Mode-On	10/6/2024 13:7 27	119 Control Panel-Unlocked	11/6/2024 15:7 57
81 Control Panel-Locked	10/6/2024 13:8 27	120 Autofirm Mode-On	11/6/2024 15:7 59
82 Control Panel-Unlocked	10/6/2024 13:18 16	121 Autofirm Mode-Auto Off	11/6/2024 15:8 0
83 Alternating Mode-On	10/6/2024 13:18 17	122 Autofirm Repositioning Mode-On	11/6/2024 15:8 7
84 Control Panel-Locked	10/6/2024 13:19 16	123 Control Panel-Locked	11/6/2024 15:9 6
85 Control Panel-Unlocked	10/6/2024 15:12 52	124 Autofirm Mode-Auto Off	11/6/2024 15:28 23
86 Autofirm Repositioning Mode-On	10/6/2024 15:12 53	125 Alternating Mode-On	11/6/2024 15:28 23
87 Control Panel-Locked	10/6/2024 15:13 53	126 Control Panel-Unlocked	11/6/2024 17:7 22
88 Control Panel-Unlocked	10/6/2024 15:23 16	127 Autofirm Repositioning Mode-On	11/6/2024 17:7 23
89 Alternating Mode-On	10/6/2024 15:23 16	128 Control Panel-Locked	11/6/2024 17:8 22
90 Control Panel-Locked	10/6/2024 15:24 15	129 Autofirm Mode-Auto Off	11/6/2024 17:27 47
91 Control Panel-Unlocked	10/6/2024 17:7 47	130 Alternating Mode-On	11/6/2024 17:27 47

Figure 1. All manual and automatic adjustments to the pump are recorded in a comprehensive History of Use report.

This data is downloaded as an Excel spreadsheet, providing clear evidence of repositioning compliance, mattress usage.



**Vestims®** is a class 2a active mattress that tracks repositioning

## Independent Case Study

An independent case study conducted at a 68-bed Barchester Healthcare care home, presented at the 2024 European Pressure Ulcer Advisory Panel Convention, demonstrated the effectiveness of the Vestims Auto 8955a mattress (4). Among 8 residents who transitioned to this system, 75% (6 out of 8) showed improvement or stability in pressure ulcer healing, with 66% (2 out of 3) of those with existing ulcers showing signs of healing.

These results underscore the system's potential to improve patient outcomes and reduce the development of pressure ulcers, further supporting the work of carers and care homes.

## Conclusion

The Vestims Auto 8955a active mattress system enhances patient safety and supports carers and care providers through its real-time functionality tracking. It offers peace of mind to carers and care homes, allowing them to focus on delivering the best possible care while meeting legal and regulatory requirements.