LINET

MANEUVERABILITY COMPARISON OF LINET SPRINT 200/400 AND OTHER STANDARD POWERED STRETCHERS



BACKGROUND

Transporting patients in hospitals is often challenging due to the architectural layout of healthcare facilities. Narrow corridors, sharp corners, and cluttered spaces can significantly complicate patient transport. Maneuvering stretchers through hospitals requires precision and effort, with transport personnel and caregivers frequently encountering obstacles such as medical carts, hospital equipment, and other people.

These limitations not only slow down patient transport but also increase the risk of collisions and injuries. Environmental barriers can lead to physical strain and operational delays. Staff often need to exert considerable effort when operating stretchers, which may lead to fatigue or musculoskeletal injuries over time.

An additional challenge arises when no dedicated transport staff are available-individuals thoroughly familiar with the stretcher's features and benefits. In such cases, caregivers who do not regularly transport patients may struggle due to improper equipment use. Therefore, stretchers must be intuitive to operate, and all personnel should be properly trained to ensure safe and efficient patient transport.

CONCLUSION

At LINET, we conducted a test comparing the maneuverability and driving features of the powered Sprint 200/400 stretcher equipped with i-Drive Power® and IV&Drive®, and a market standard powered stretcher. The test was carried out on a specially designed track simulating typical hospital obstacles faced during patient transport. The track included sharp 90° turns, a parking zone, and narrow corridors to reflect real-world hospital environments.

To evaluate and compare the stretchers, we used two key metrics: total driving time and the number of displaced cones, representing obstacles that were hit or moved when the stretcher left the designated path. The test was performed by 18 volunteers, most of whom had no prior experience operating hospital stretchers.

The results showed that the Sprint 200/400 achieved, on average, 14% faster and displaced less cones by 45 % compared to the standard powered stretcher. These outcomes highlight the improved maneuverability and ease of operation of the Sprint 200/400 with i-Drive Power® and IV&Drive®.

Evolution of Modern Stretcher Designs for Enhanced Hospital Transport

As hospitals modernized in the late 19th and early 20th centuries, with more structured layouts and corridors, stretcher designs evolved to support smoother mobility in these environments. Narrower widths were introduced to navigate tight hallways, and wheels were added to facilitate movement across hospital floors.

By the mid-20th century, the growth of hospitals and the development of emergency departments prompted the creation of wheeled stretchers with collapsible siderails and height-adjustable platforms. However, these manual stretchers still demanded significant physical effort from healthcare staff.

Patient transfers consume an average of 42 minutes of a nurse's time per day.

(Blay N, 2017)

In recent decades, powered stretchers have been developed to address these challenges-especially in large hospitals where long-distance patient transport is routine. Additionally, patient transport has been linked to musculoskeletal injuries among healthcare staff (Vinstrup J, 2020). Even with dedicated transport personnel, the risk of injury remains for anyone involved in patient transport.

To address this, powered stretchers have been introduced, designed to minimize the physical strain of pushing and pulling. Featuring motorized wheels and load-assist systems, these stretchers reduce biomechanical stress-especially during maneuvers through ramps and tight corners (Kotowski SE, 2022; Lad U, 2018).

Powered stretchers are revolutionizing hospital transport by addressing one of the most persistent challenges: navigating narrow hallways and avoiding obstacles. With motorized assistance, staff can transport patients more smoothly and efficiently, without requiring excessive force or repositioning in crowded environments. But this raises the question: are all powered stretchers the same? Are there differences in how they drive and maneuver?

LINET Solution Sprint 200/400 for Easy Maneuverability

The Sprint 200/400 stretchers offer an effective transport solution within hospitals and between departments. Equipped with the i-Drive Power® system, the stretcher can be driven effortlessly at the push of a button, covering up to 11 km on a single charge. Key features include a central steering wheel for easy cornering and smooth navigation through corridors, and IV&Drive® ergonomic handles. These allow caregivers of all heights to operate the stretcher comfortably without adjustments, making transport more efficient and less physically demanding.

The ergonomic driving design and its benefits for hospitals and staff are detailed in the LINET white paper: Best Practices for Patient Transport on Sprint 200/400 for Reducing Musculoskeletal Disorders (LINET, 2025).

TESTING MANEUVERABILITY ON A SPECIALLY DESIGNED TRACK

To assess maneuverability, we constructed a narrow test track simulating typical hospital conditions. The course included two sharp 90° turns, a designated parking zone, and a final straight section for speed performance testing (IMAGE 1). Cones represented environmental challenges, such as walls and other obstacles.

The course sequence (IMAGE 1):

- **Standard powered stretcher (market standard):** Requires initial manual pushing to engage the drive system; weight: 210 kg.
- **LINET Sprint 200/400 with i-Drive Power® and IV&Drive®:** Drive system is activated via control panel-no pushing required; weight: 167 kg.

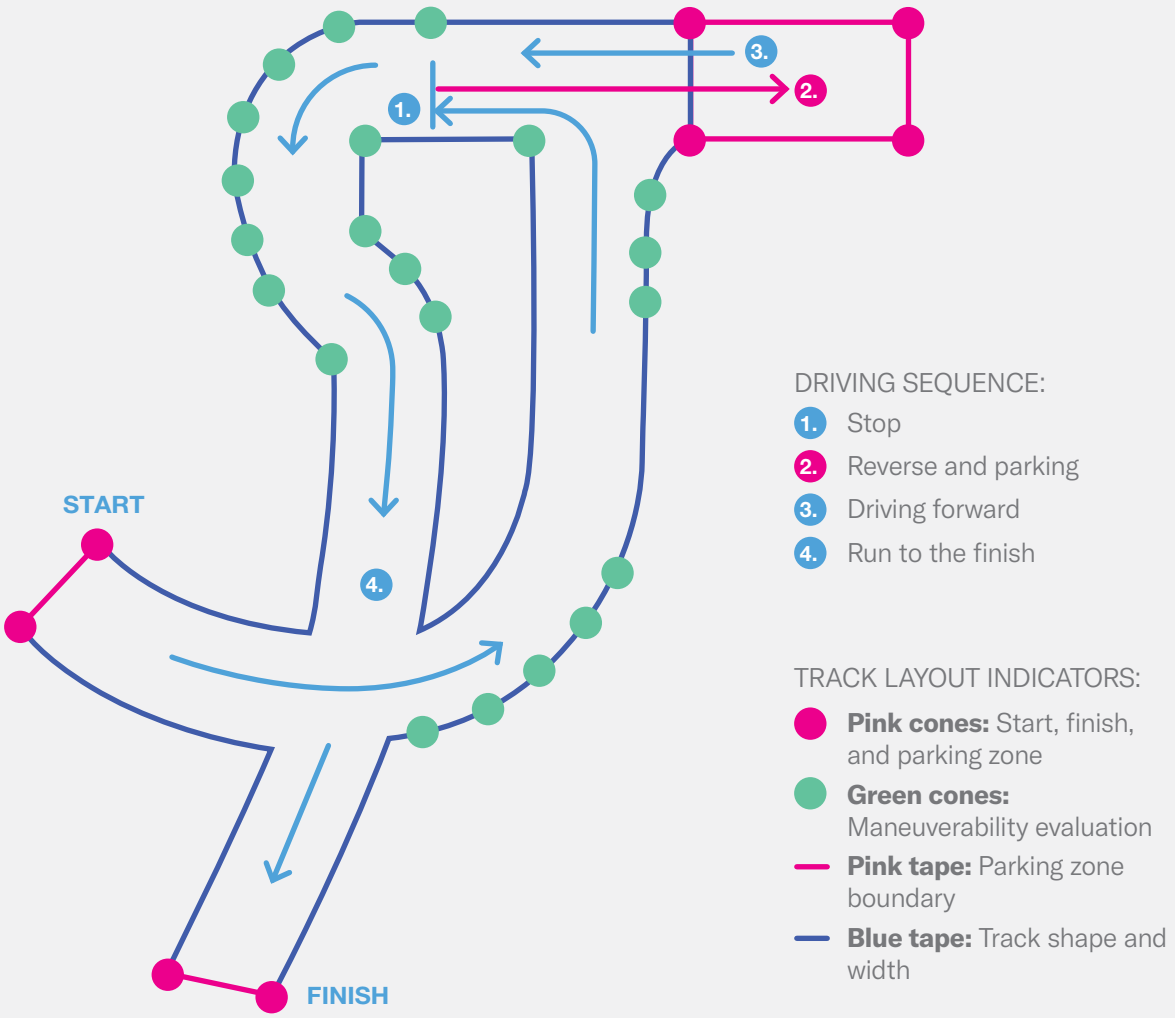
Eighteen volunteers (9 male, 9 female) of varying age, height, and weight participated. Each was instructed to complete the course as quickly as possible without touching cones. A prize was awarded to the fastest participant to enhance motivation and performance.

Each participant completed the course with both the Sprint 200/400 and the standard powered stretcher.

The course sequence:

1. Drive forward from start to Point 1 and stop.
2. Reverse into a parking area marked by pink cones.
3. Drive forward and navigate a 90° sharp turn.
4. Accelerate down the final straight to the finish line.

IMAGE 1 | A test track designed to simulate a hospital environment for evaluating stretcher driving performance.



ASSESSING DRIVING AND MANEUVERABILITY

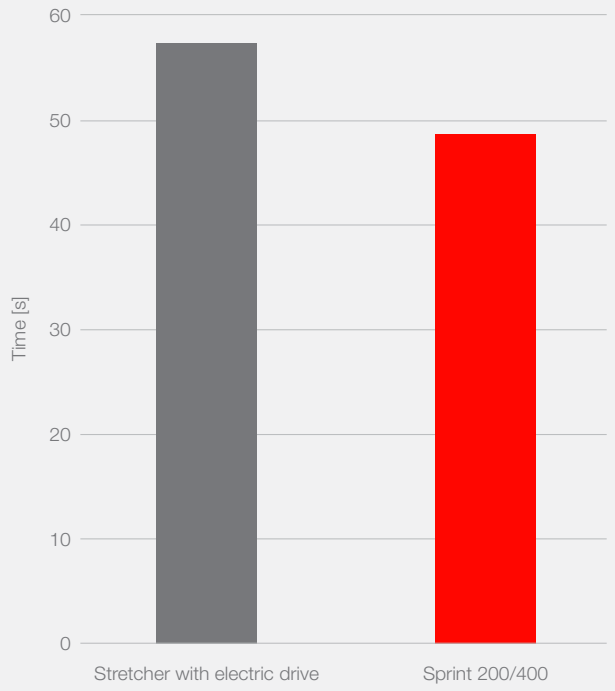
Two criteria were used: completion time and number of displaced cones. Each displaced cone added a 5-second penalty. We compared the average total time (including penalties) and the average number of cones displaced for each stretcher.

RESULTS

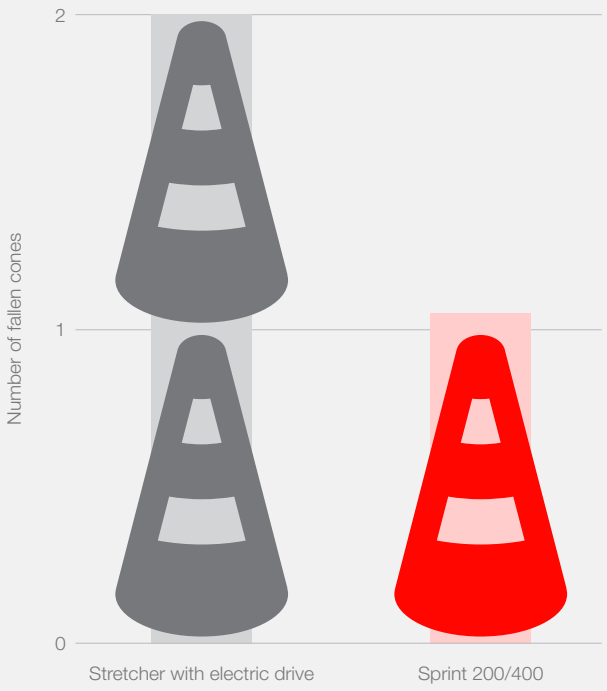
The Sprint 200/400 achieved an average total time of 49.4 seconds (GRAPH 1), demonstrating consistent and efficient performance across users. It also resulted in an average of just 1.1 displaced cones (GRAPH 2), indicating a high level of control and minimal contact with obstacles on the track.

In comparison, the standard powered stretcher performed less effectively, with a mean total time of 56.8 seconds (GRAPH 1). It also caused significantly more navigation errors, with an average of 2.0 displaced cones per run (GRAPH 2). The longer duration and higher number of displaced cones reflect lower handling precision compared to the Sprint 200/400.

GRAPH 1 | Average total time (including penalties)



GRAPH 2 | Average number of cones displaced



The fastest time recorded was 29.1 seconds (Sprint 200/400, no cones displaced). The same participant also achieved the fastest time with the standard stretcher: 37.6 seconds (no cones displaced).

Several users reported to feel more in control maneuvering Sprint 200/400, particularly because it required no manual push to activate the drive. Stopping was simpler by just releasing the button or using the SafetySense® feature halted the stretcher immediately when the user's hand left the controller.

In contrast, braking with the standard stretcher required more effort, and the stretcher did not stop immediately, often rolling forward for a few seconds. One lightweight female participant, unaware of this, overshot the finish line and the stretcher hit a wall. Sharp turns were also more difficult due to the standard stretcher's larger turning radius.

SUMMARY

Overall, the Sprint 200/400 completed the track 14% faster and hit 45% fewer cones than the common powered hospital stretcher. These findings demonstrate that the Sprint 200/400, featuring the i-Drive Power® system, ergonomic M&Drive® handles, and a centrally placed fifth wheel, offers significant advantages in speed, precision, and maneuverability for patient transport in real hospital settings.

LINET stretcher Sprint 200/400 completed the track 14% faster and hit 45% fewer cones than the common powered hospital stretcher.

(LINET lab testing)

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