stryker

Case Study

Hospital Focuses on Mobility with Big Wheel

Situation

A report in *Compensation and Working Conditions* stated that 59% of all nursing injuries were "due to overexertion."[1] And most experts were in agreement that these injuries were usually a cumulative result of several years of routine daily activity. This phenomenon is known as **Cumulative Trauma Disorder**.

Hospitals looking to trim compensation costs and lost time due to employee back injuries need to find ways to reduce clinical back strain. Baylor Medical Center at Irving, based in Texas, is one such facility putting a focus on patient transport and the effects enhanced mobility features can have on easing caregiver strain.

Rationale

Over the years, Stryker Medical has led the market with ergonomic features for its stretchers. Pop-up push handles, transfer boards, an improved caster design, permanent IV poles and IV caddies all contribute to proper ergonomic care of both clinicians and patients. Stryker Medical wanted to build on this legacy and develop the next generation in patient transport.

Seeking a solution to decrease the effort required to push and steer a stretcher, Stryker engineers started with the basic premise that a larger wheel reduces rolling resistance. They sought to design something as simple to use as fifth-wheel steering — a feature that significantly eased steering effort when introduced by Stryker in the 1960's.

Test Configuration

SM204 With Big Wheel
Standard Unit With:
- 4-in. Ultra Comfort mattress
- Four-sided brake/steer control
- Pop-up push handles
- Permanent IV pole
- Hydraulic knee gatch*

SM104 With Fifth wheel
Standard Unit With:
- 4-in. Ultra Comfort mattress
- Four-sided brake/steer control
- Pop-up push handles
- Permanent IV pole

* Hydraulic knee gatch added an additional 12 lbs to the SM204 stretcher with Big Wheel

[1] *Compensation and working conditions, "Dangerous Jobs," Summer 1997.*

Methodology

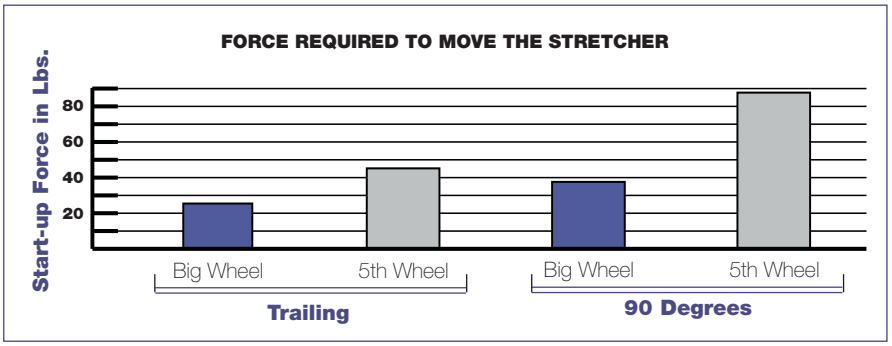
Stryker designed a mobility option that consists of two large wheels at the base of the stretcher. The wheels, when engaged by a simple pedal activation, lift the stretcher off its two foot-end casters. This places the majority of the patient's weight (80%) on the two large center wheels, providing the lowest push effort possible without sacrificing stability. The invention is known as the Big Wheel.

It is the effectiveness of this technology that Baylor set out to validate.

Results

Baylor conducted a comparative study between two similarly-configured Stryker stretchers — the SM104 with a fifth wheel and the SM204 with a Big Wheel. The Big Wheel was found to reduce the start-up effort by an average of 45% with the casters trailing and 58% with the casters perpendicular to the stretcher on carpet.

The study was conducted with a 420-pound model of a patient on both stretchers on carpeted surfaces. The results reflect an average of five tests with each product. The comparison measures push force by means of a force-gauge.



Conclusion

One way to help address the problem of **Cumulative Trauma Disorder** is to limit the effort exerted by caregivers when moving patients. Baylor concluded that the Stryker Big Wheel significantly reduces the effort to push patients.

Stryker SA
Cité Centre
Grand-Rue 90
1820 Montreux
Switzerland

t: +41 21 966 12 01
f: +41 21 966 12 00

www.stryker.eu

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