Situation
The healthcare profession continues to be a career that puts the physical health of the caregiver at risk due to its daily activities. Healthcare Professionals (HCP) perform an array of physically demanding tasks, many of which contribute to work-related musculoskeletal disorders and, even potentially, the termination of career. The New York Nurses Association reports that nurses lift an equivalent of 1.8 tons per shift. This rigorous manual lifting results in a HCP being 4.5 times more likely to sustain a back injury due to overexertion when compared to other professions.

Rationale
Understanding that nursing remains a profession where the risk of injury is high, Stryker developed its Prime Series stretcher with Big Wheel and electric lift. The electric lift is better for HCP safety as the stretcher litter is able to be raised with reduced manual exertion. Design features which minimize exertion may reduce the risk of injury and in turn may reduce the burden rate of healthcare organizations.

Methodology
In order to determine the workload that the HCP endures when lifting the litter of a stretcher, Stryker conducted a stretcher lift study which measured and compared the amount of force required to lift the stretcher. The stretchers that were used included a Prime Series stretcher with 5th wheel mobility and manual lift, a Hill-Rom P8000 with manual lift, and a Prime Series stretcher with Big Wheel advanced mobility and electric lift. The stretchers were tested with no weight and with patient weights of 250 lbs, 500 lbs and 700 lbs.

Results
Lifting a manual stretcher from low height to its highest height takes approximately 26 pumps. This exercise results in an excessive amount of force required to lift a stretcher; upwards of a metric ton with patient weights over 500 lbs. In contrast, the study revealed that a Stryker Prime Series stretcher with Big Wheel and electric lift, which requires a single pump with a force of 50 lbs to reach its highest height, can reduce the total force required to lift a stretcher.

Conclusion
Stretcher functionality has a significant impact on the well-being of caregivers. Implementing Stryker’s Prime Series stretcher with Big Wheel and with electric lift can help reduce the forces and amount of exertion required of HCPs.

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Stryker Prime Series® stretcher with Big Wheel® and electric lift reduces exertion when lifting the stretcher litter

<table>
<thead>
<tr>
<th>Stretcher Hydraulic Pump Pedal Forces in Lbs</th>
<th>Patient Weight – 0 lbs</th>
<th>Patient Weight – 250 lbs</th>
<th>Patient Weight – 500 lbs</th>
<th>Patient Weight – 700 lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stretcher Model</td>
<td>Force to pump stretcher one time</td>
<td>Total approximate lbs of force required to lift stretcher*</td>
<td>Force to pump stretcher one time</td>
<td>Total approximate lbs of force required to lift stretcher*</td>
</tr>
<tr>
<td>Prime Series Stretcher with 5th Wheel and Manual Lift</td>
<td>37 lbs</td>
<td>962 lbs</td>
<td>60 lbs</td>
<td>1560 lbs</td>
</tr>
<tr>
<td>Hill-Rom P8000 with Manual Lift</td>
<td>40 lbs</td>
<td>1040 lbs</td>
<td>61 lbs</td>
<td>1586 lbs</td>
</tr>
<tr>
<td>Prime Series Stretcher with Big Wheel and Electric Lift</td>
<td>50 lbs</td>
<td>50 lbs</td>
<td>50 lbs</td>
<td>50 lbs</td>
</tr>
</tbody>
</table>

*Approximately 26 pumps are required to lift a stretcher litter from its lowest height to its highest height

References

Testing completed by Stryker Medical.