Best Practice for Bariatric Patient Ceiling Lifts

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As Safe Patient Handling Technology has evolved, overhead ceiling lifts are recognized as a very effective and versatile safe patient handling solution. Ceiling lifts have gained in popularity due to some of the implementation issues which arise with the use of portable base patient lifts. Some of these issues related to the use of portable base patient lifts include the fact that often different devices are needed to perform various lifts, and the lifts need to be easily accessible, normally within 50 feet from the point of need. This means more devices and more storage space. In addition, the time and number of steps involved in locating the equipment and moving the patient using floor lifts are considerable. This being the case, it has been difficult to attain 100% compliance using lifts for patient-handling tasks. In comparison, patient ceiling lifts require fewer steps to accomplish the task, minimal physical effort to maneuver, and less space to operate and store, and they are available at the point of need when required.[1] Furthermore, ceiling lifts are capable of lifting heavier loads.

Because ceiling lifts are capable of lifting heavier loads and have been shown to be to be the least demanding method of patient handling, [2] they have gained popularity for application in settings where bariatric patients are frequently encountered. When designing and implementing patient ceiling lift systems for application with bariatric patients rated weight limits and design configurations become an even more important considerations than with traditional ceiling lift systems. In order to meet demands for effective patient ceiling lift systems for application in settings with bariatric patients, dual motor systems have been introduced as an alternative to single motor systems. With a dual motor system two individual ceiling lift motors have been proposed to be combined to achieve a higher rated lifting capacity. Single motor systems have one ceiling lift motor capable of lifting up to the desired rated capacity. With the availability of two distinct and different design configurations the question arises; are both equally safe and appropriate, and are there any shortcomings for one type of system?

This article is the result of research into information available to help practitioners determine level of safety and appropriate design configuration for patient ceiling lift systems for application with bariatric patients. Much of the recent information presented on this topic related to patient ceiling lifts is based on opinion and lacks an evidence base. This being the case, the technology from which patient ceiling lifts have evolved seems to be a logical knowledge base to investigate to compare single motor to dual motor patient ceiling lift systems. This technology would be that referred to as bridge, gantry or overhead cranes. These overhead cranes have been in use for many years and were manufactured in Germany as early as 1830 by Ludwig Stuckenholz company now Demag Cranes & Components GmbH.[3] There are a number of applicable standards and regulations related to the use and application of

overhead cranes. These standards include American Society of Mechanical Engineers (ASME) and International Organization for Standards (ISO) standards plus Occupational Safety and Health Administration (OSHA) regulations.

Based on these standards and regulations providers of overhead or gantry cranes have developed user manuals for crane operations which provide safety information directly applicable to the use of overhead patient ceiling lifts. A very important section of these manuals relates to "Load Capacity" and states: **"**Do not use your gantry and/or accessories to lift more than their rated capacity. Capacity ratings are based on new equipment. Age, dirt, improper maintenance, and daily wear will reduce the operating capacity of the gantry and/or accessories. Do not continue operation of any equipment damaged by overloading. Never attach a load greater than the capacity of the equipment. Never use two pieces of equipment to lift a load greater than the rated capacity of a single piece of equipment. A shifting load may place the entire load on either piece of equipment, causing one to fail. Apply the load evenly. Do not jerk or bounce a load or allow a load to swing. Avoid violent motions, shock loads, or any other loading for which the equipment is not rated. This type of loading requires equipment of greater capacity. Never exceed the rated load capacity of the smallest component being used in the system. Review the capacity of each component in the system and load the system to the smallest capacity only."[4]

Based on this accepted information from the overhead crane industry it does not seem acceptable to combine two motors to increase load capacity of patient ceiling lifts. Whether one or two motors are used the rated capacity for the system should be the highest rated capacity of any individual motor or component whether it be one or two motors applied in the system. Best practice for application of overhead patient ceiling lifts, considering accepted industry standards and regulations, for load capacity would be that the load to be lifted should not exceed the rated capacity of any single component of the system. Components include motors, rails, rail mounts, slings and any other part of the system which will bear weight. In addition a comprehensive evaluation of the supporting structure is required to insure the structure to which the system will be mounted is capable of supporting loads to be lifted.

References:

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4. Gantry Crane Owner's Manual, Contrx Industries, Inc. 1377 Kimberly Drive, Neenah, WI 54956 Phone: 920-722-0101 | Fax: 920-722-5260, Bushman AvonTec 262-790-4200, 800338-7810, Fax 262-790-4200