

# Replacing the wheelchair

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Depicted in fifth century Chinese art, the wheelchair is not a new invention. The invalid carriage, called a Bath chair, was developed in Bath, England, around 1760. The modern, steel-frame, collapsible chair dates to 1933.

The wheelchair had not changed much in all that time. Now, there is Movi.

Movi is a replacement of the old-fashioned wheelchair. It is designed for use in a hospital or skilled-nursing facility, or even in the home as a mobility aid. It stems from recognition by University of Alabama at Birmingham Health System CEO Will Ferniany that traditional chairs do not meet the needs of modern hospitals.

"We were commissioned by Dr. Ferniany at UAB to create an alternative to the conventional wheelchair," said Lloyd Cooper, designer for Movi Medical, a company created to design, build and market the new chair. "Every hospital around the world uses a conventional wheelchair that was developed as a self-propelled mobility device, and was never intended to be used in hospital applications."

A wheelchair has some drawbacks for hospital use. The big rear wheels are designed so users can move themselves, while patients in a hospital are nearly always pushed by staff. The swinging, removable footrest contraption is a nightmare—hard to use, easy to lose and not very comfortable. The sling seat stretches over time, and even at its best is not ergonomically designed to be comfortable. Getting into or out of a

conventional wheelchair is difficult for patients who are sick, old or recovering from a medical procedure.

"A [wheelchair](#) is one of the most compromised seating environments imaginable," said Cooper, who has extensive experience in automotive seating and ergonomic design. "It should be the reverse. Those who need a chair need the very best chair."

Cooper says he started without any preconceived ideas, the proverbial clean sheet of paper. He sat down with a team of experts assembled at UAB: geriatricians, nurses, transport staff, health and safety experts, exercise physiologists, physical therapists, and senior administrators. The Movi design is a blend of input from many sources.

"We had about eight key items to address, including increased maneuverability, low rolling resistance, minimizing patient falls, and improving access into and out of the chair," Cooper said. "One very important item was minimizing staff injuries from assisting patients. We also looked at integrating medical equipment, such as IV poles or catheter bags, as a way to make the chair more efficient."

Movi is a lift chair with a battery-powered motor. It pivots on its axis to raise or lower a patient up to 20 degrees. When the chair is raised, the integrated footrest lies flat on the floor. This makes it much easier for a patient to get into or out of the chair. It minimizes fall risk and the likelihood of injury to transport staff.

"We've become more aware in recent years of the number of injuries to nurses and patient care technicians, as well as family members, from lifting patients," said Cynthia Brown, M.D., director of the UAB Division of Gerontology, Geriatrics and Palliative Care and one of the consulting team for Movi. "We see back injuries and shoulder injuries, and have found that a whole segment of our workforce is at risk as they

attempt to mobilize patients."

The Centers for Disease Control and Prevention reports that the overexertion injury rate for hospital workers is twice the average across all industries and it is three times higher for nursing home workers. The single greatest risk factor for overexertion injuries in health care workers is the manual lifting, moving and repositioning of patients.

The chair is ergonomically designed for comfort, rolls easily and can carry an array of [medical equipment](#). It even has 6 cubic feet of space for a patient's belongings.

UAB has purchased 10 of the Movi chairs and has ordered 100 more. The Birmingham VA Hospital has purchased 20, and Movi Medical is also talking to other hospitals about the new chairs.

But that is only part of the story, according to Gray Shipley, CEO of Movi Medical.

"We're developing a 'one patient, one Movi' concept, in which a patient would be assigned a Movi chair upon admission to a hospital," he said. "The chair would stay with that patient throughout his or her hospitalization."

Having a designated Movi chair would make it easier for a patient to transition from lying in bed to a sitting position in the chair. There's growing awareness that getting patients up and moving is beneficial to healing. That is especially true in the elderly. Brown, who is also the director of the UAB Comprehensive Center for Healthy Aging, says research shows that older patients spend 83 percent of their time in a hospital lying in bed.

"We've gotten so worried about older patients falling that we've

minimized their out-of-bed activity," Brown said. "We now know that prolonged bed rest contributes to pressure ulcers and deep-vein thrombosis, as well as contributing to functional decline. There are all sorts of bad outcomes from encouraging people to stay in bed."

Brown thinks a lift-assist device such as the Movi chair could make a big difference.

"Ask any older adult and they will tell you they want to remain independent," she said. "They want to be able to do things for themselves. In many respects, we owe it to them to keep them as functional as possible so they can maintain their independence even after a hospital stay."

Brown suggests that Movi could also be very valuable in the skilled-nursing facility environment, and even at home for elderly individuals with mobility issues.

Movi Medical also offers Movi 2, or M2, the second-generation chair, which is designed for the home and nursing facility market. It has additional creature comforts such as an adjustable headrest, fully padded arm supports, folding side table, extended leg rests and side storage pockets. It is even available in custom colors and fabrics to match a home's décor.

Shipley says Movi is in discussions with potential partners to boost manufacturing and distribution to the marketplace. He has already seen instances where the chair has made a major difference in someone's life.

"Maybe it's somebody who couldn't stand at home before, and was going to have to go into a skilled-nursing facility," he said. "And you see the Movi chair has given them the ability to stand, be mobile and remain independent. It really does drive us and make an impact."

Provided by University of Alabama at Birmingham

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