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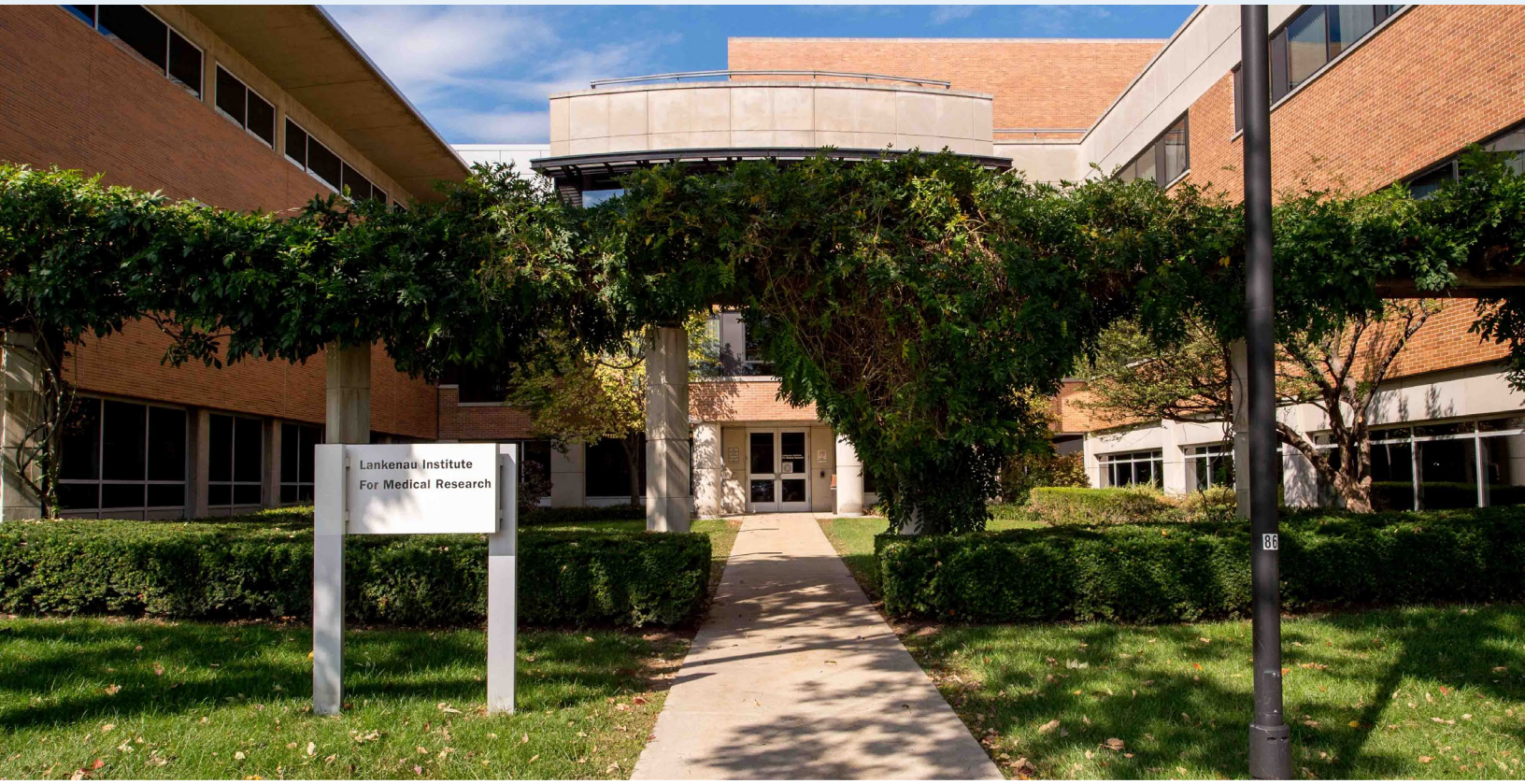

A Nurse-Invented Limb Support to Facilitate Wound Care

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Summary

Wound care on limbs, hands, and feet by nurses or other caregivers often requires assistance from a colleague. We describe the nurse-designed Rogers Limb Support, designed to elevate and stabilize a patient's limb for wound care by a single caregiver, suitable for use in hospital, senior care, and home care settings. This lightweight support has three Velcro-attached sections that allow the caregiver to quickly adjust limb elevation as needed, whether on the bed, at the bedside, or beside a chair. The Rogers Limb Support is covered in hospital-grade urethane and is easily sterilized between uses. At the patient contact site, a specially molded cradle supports the limb and enables wound access while providing a comfortable setting for the patient while care is administered. The features assembled in the Rogers Limb Support provide a simple, safe, and versatile solution for caregivers providing wound care in a variety of healthcare settings.

Introduction

The care of acute or chronic wounds in the hospital, senior care, and home care setting by nurses and other healthcare workers often requires assistance from a colleague. Manually lifting and holding a limb is necessary many times a day when caring for patients in the acute care setting, often in relation to wound care. Surgical wounds, an aging population, malnutrition, diabetes, the obesity epidemic, and other comorbid conditions predispose patients to chronic, difficult-to-heal wounds.

Healthcare workers often care for wounds that require specifically positioning an arm or leg to enable direct visualization. Healthcare workers who perform wound care — such as wound, ostomy, and continence nurses (WOCNs), inpatient clinical nurses, podiatrists, and surgeons —

are challenged and often concerned about requiring assistance to provide timely care when one or more staff members are needed but not readily available. Healthcare workers who assist may be required to lift a limb for an extended period of time, placing them at risk of musculoskeletal injury due to prolonged patient handling. Furthermore, the patient's condition, such as obesity and location of the wound, contributes to a more difficult limb support procedure.

Currently, standard of care or methods to support a limb include the use of pillows, stacked blankets, or a limb sling. While helpful, pillows are bulky and do not allow the caregiver to access or visualize the limb effectively. When a wrap dressing is needed, lifting the limb intermittently is required. Another commercially available option is a limb sling. Not all environments or organizations have limb-sling lifting devices, such as installed ceiling lifts or freestanding portable devices on wheels, due to expense, storage space, or other reasons. Other barriers include user responsibilities such as the need to charge, store, and locate the device.

Design and Design Trials of the Rogers Limb Support

The Rogers Limb Support design includes several key elements to address challenges in limb wound care by nurses or other caregivers (see **Figure 1**).

The first is a rapidly adaptable cradle to stabilize the limb. The tripartite design permits variable heights for limb elevation, whether from a bed, the floor at bedside, or the floor beside or in front of a chair (see **Figure 2**). It is lightweight — under two pounds for a fully assembled three-section tower. In design trials by caregivers, its lightness was noted as making the tool easy to handle for patient care, cleaning, and storage — singly and in bulk. The square design and dimensions provide excellent stability on a bed or floor surface, with a base of less than one

square foot at the bottom of all three sections. Comments from design trials noted an excellent combination of sufficient base for stability on a bed top or floor without being too large to maneuver. Velcro straps allow caregivers to quickly maneuver the three sections of the device to create a low, medium, or high support needed for limb elevation. Comments noted that good choices are available from the three levels available by changing the number of sections assembled for various needs. Further, it was noted that the tool provides a way to improve the reproducibility of the care and patient experience as compared to ad hoc support provided by nurse colleagues when care is administered.

The second key element of the Rogers Limb Support is its cover material and ease of sterilization (see **Figure 3**). The device is covered in medical grade urethane, identical to many other hospital supports and tools that directly contact patients during their care. The material has an established track record, including how quickly it can be sterilized between uses. For example, alcohol- and nonalcohol-based solutions widely used by hospitals and other care organizations can be used to clean and sterilize all surfaces. This aspect of the design was welcomed in design trials, where nurses could be assured that the device covering, especially the part contacting the patient, represented an established hospital standard.

A third key element is a specially molded cradle for the limb that enables wound access while providing a comfortable setting for the patient when care is administered. Clinical testing planned by our team, based on a protocol recently approved by the Main Line Health Institutional Review Board, will further explore wound access and care utility of the design along with patient-reported data regarding comfort for various periods while their limb(s) are supported for wound care.

Discussion and Conclusions

Use of the Rogers Limb Support can help improve the delivery of wound care in several ways. First, it can reduce the number of nurses needed by allowing a single caregiver to lift, support, and stabilize a limb and then complete the procedure. In addition, it can eliminate prolonged manual and repetitive lifting, reducing the risk of patient-handling-related injuries from unnecessary strains. Additionally, it provides a reproducible setting for wound care that offers a comfortable and stable approach to the patient for the procedure. The Rogers Limb Support is easy to use, clean, and store. It is also easy to carry and place into position for wound care, offering a low-cost solution for stable limb elevation and support. In summary, it offers benefits and satisfaction to users who deliver wound care (nurse, WOCN, podiatry, or other caregivers) as well as patients who require such care.

To our knowledge, the Rogers Limb Support features a combination of design elements not found together in any other patient support. In gauging the key elements of a useful limb elevation device, we created a rapidly adaptable cradle with a readily sterilizable covering of established use and safety. The specially designed limb contact point may enable reproducible safety, efficiency, and patient comfort, which is being assessed in an ongoing clinical trial. In conclusion, we propose the Rogers Limb Support as a simple and versatile solution for caregivers and wound care nurses to consider in various healthcare settings, including hospitals, senior care, home care, and hospice organizations. Further information about this device and how to purchase it can be found at the Lankenau Ventures website at lankenau.com.

Figures

Figure 1. Rogers Limb Support for Wound Care. Tripartite design of detachable sections covered by hospital-grade urethane. Limb support from bed or floor can be varied in height by using one, two, or three modules attached by Velcro strips. The top module contacting the patient is specially molded to comfortably and stably cradle a patient's limb for care.

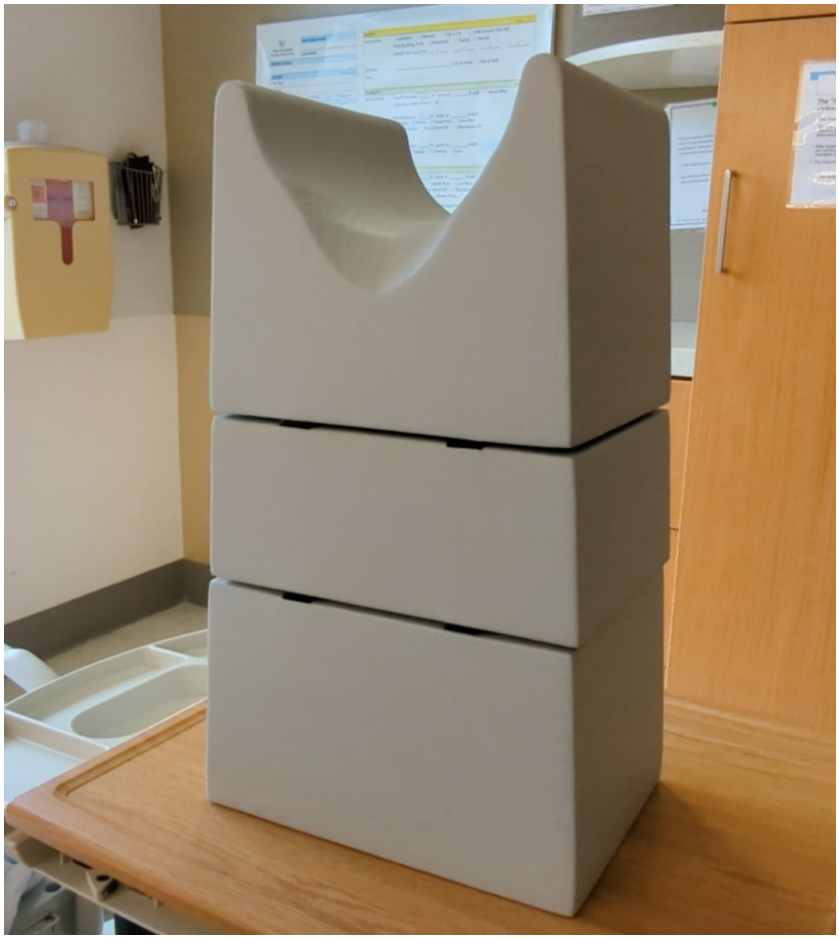

Figure 2. Applications of the Rogers Limb Support. Three modules of the device are separated by Velcro detachment. (A) Single top module cradles arm of patient in bed. (B) Single top module cradles leg of patient in bed. (C) Additional module further elevates limb to one of two different levels using middle or bottom module of different heights. (D) Full-height device using all three modules elevates a limb from the floor, from the bedside, or a chair.

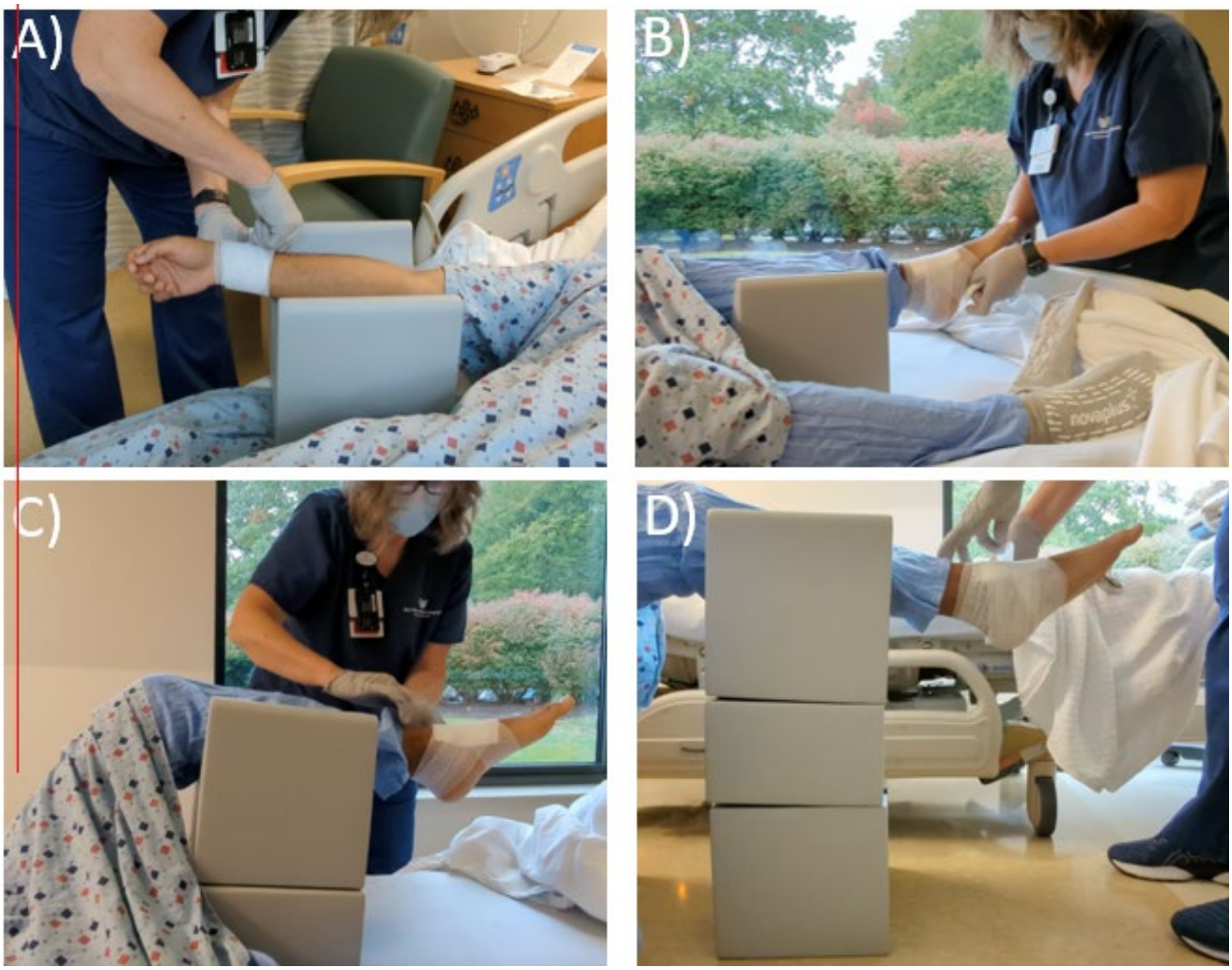

Figure 3. Sterilizing the Rogers Limb Support. The urethane covering is readily cleaned and sterilized by alcohol- or nonalcohol-based wipes that are used widely in hospital, senior care, home care, and other caregiver settings.