

# Beyond the ICU: Caring for the Critically Ill Patient

Patients with protracted critical illness and those who are difficult to wean off a mechanical ventilator need specialized care beyond that given in an intensive care unit.

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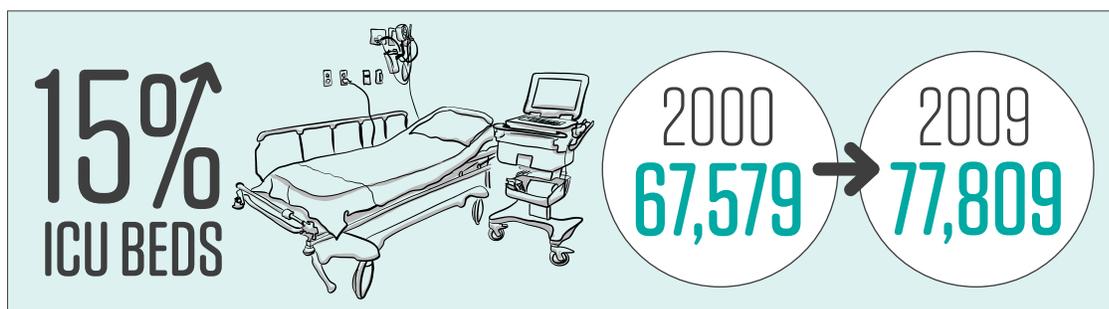
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One of the patients in your intensive care unit (ICU) has been on invasive mechanical ventilation for seven days, with two unsuccessful attempts at liberating from the ventilator.

Another patient is recovering from a liver transplant and has been in the ICU for 17 days.

The above are not rare occurrences. The volume of patients admitted to ICUs has been rising dramatically. The number of ICU beds in the United States increased 15 percent, from 67,579 in 2000 to 77,809 in 2009 [1], and consequently, almost six million admissions to an ICU occur annually [2], according to the most recent analysis of ICU bed supply.



The majority of critically ill patients stay only a few days or have a length of stay [LOS] that corresponds to what is expected based on admission diagnosis and severity of illness. [3, 4]. Yet, there are a fair number of patients whose ICU stay is indicative of protracted illness and treatment. These patients are often described as having chronic [5] or persistent critical illness [6].

## Patients with a chronic or persistent critical illness can be extremely resource-intensive.

Although the percentage of patients with chronic and/or persistent critical illness make up less than 10 percent of the ICU population, they disproportionately account for beds, require substantial nursing care and incur huge costs. On average, these patients consume 32.8 percent of all beds [6] and are expected to reach \$60 billion in the total cost of care by 2020 [7]. Further, less than half of patients with an ICU LOS of greater than 10 days are discharged home [8]. Of those alive at discharge, many end up in skilled nursing facilities (SNF), inpatient rehabilitation facilities (IRF) or hospice. All of this leads to greater patient morbidity and health systems cost.

## Fortunately, there is an alternative to keeping patients with chronic and/or persistent critical illness in an acute care hospital's ICU: discharging to a critical illness recovery hospital, also known as long-term acute care hospital (LTACH).

Critical illness recovery hospitals (CIRHs) are **specialized hospitals** that care for patients with a prolonged need for an acute level of care. Unique to the United States, these hospitals can be external to an acute care hospital (“free-standing”) or internally located, but in a distinct area of the hospital.

CIRHs have the staff and resources to maximize the chances of chronically ill patients recovering and returning home. As opposed to ICUs, whose primary mission is patient stabilization and subsequent transfer to an area of lower acuity, CIRHs focus on the patient's recovery and return to a functional life.

## **CIRHs serve patients with prolonged critical care needs: for example, long-term intravenous medication, invasive mechanical ventilation and wound care.**

CIRHs provide intensive, long-term hospital care along with appropriate ancillary services such as physical rehabilitation. Patients come from an acute care hospital's ICU where they typically have been treated for at least three days. CIRHs facilitate recovery from critical illnesses through specific processes designed to improve functional recovery. CIRHs are not equivalent to SNFs or IRFs; SNFs and IRFs serve patients of lesser acuity and treatment needs. Unlike SNFs and IRFs, CIRHs are licensed, accredited and certified as acute care hospitals, with comparable acute medical/surgical floors, telemetry and an ICU. CIRHs provide continuous acute care throughout a patient's stay, offering services like critical care infusion drips, labs and diagnostics.

One subgroup of patients found in CIRHs are on invasive mechanical ventilation for a prolonged period and are difficult to liberate. There is no consensus on what constitutes a "prolonged period," and discharge from an ICU to a critical illness recovery hospital should be based on a patient's clinical course and treatments [9-12]. CIRHs provide an ideal environment for implementing evidence-based strategies for liberation from prolonged mechanical ventilation [13], with an emphasis on reducing adverse ventilator-associated events including pneumonia and infection, ensuring personal nutrition needs and using standardized liberation protocols [5].



*"My family and I will be forever grateful to all who were involved in my case."*

## Select Specialty Hospital - Columbus South

Carolyn Fisher, 75, was at home and became short of breath. She dialed 911 and was admitted to the hospital. As she was wheeled back from the radiology department, Carolyn stopped breathing. Quickly, emergency personnel put a tube in her throat. The scans showed fluid on her lungs and congestive heart failure. The 75-year-old spent six days on mechanical ventilation while her family gathered around for support.

When she awoke doctors tried unsuccessfully to liberate her from the ventilator. Five days later, her family chose Select Specialty Hospital – Columbus South, a critical illness recovery hospital specializing in the care of complex patients like Carolyn. Before becoming sick, Carolyn prided herself on being fully independent.

"I wanted to get back to that and Select Specialty Hospital staff was just as determined as I was to get me there," she said. A physician-led team of nurses, therapists, dietitians and aides created a plan to help Carolyn reach her goals.

They began with the **mobility program**, with nurses and physical therapists helping Carolyn sit up in bed. Even simple movements can positively affect a patient's ability to be freed from a ventilator. She **gained strength** each day, moving quickly from sitting in bed, moving to its edge and finally to a chair. Respiratory therapists gradually reduced the amount of work the machine did, allowing Carolyn's lungs to take over.

Once **off the ventilator**, speech-language pathologists led Carolyn through exercises that restored her ability to chew and swallow safely. Dietitians followed closely, adjusting her diet over time to softer, thicker foods and finally, standard meals.

Carolyn also took short walks to the therapy gym, where physical and occupational therapists helped her navigate steps and self-care activities such as brushing her hair.

By the time she celebrated her birthday in October, Carolyn was able to enjoy cake and a full-blown party complete with hats, streamers and plenty of good cheer courtesy of her care team.

"It was very special. I was here to celebrate it," she said.

**"I am a survivor.** I survived breast cancer for 25 years."

A few days later, Carolyn was overjoyed to learn she didn't need inpatient rehabilitation. **She was going home.**

"My family and I will be forever grateful to all who were involved in my care," she said. "I have a new respect for those who have a calling to care for others."



## What makes a critical illness recovery hospital different from a standard ICU?

An acute care hospital's ICU focuses on stabilizing the patient allowing that individual to be sent to a unit of lesser acuity. However, there are many needs which may not be given sufficient emphasis in an ICU, particularly for patients with a chronic critical illness. Care for this population requires coordinated clinical collaboration and resources that combine critical care with innovative rehabilitation. Critical illness recovery hospitals' multidisciplinary approach utilizes intensivists, nurses, respiratory therapists, physical therapists, pharmacists, dietitians and case managers [14].

Evidence-based exercise protocols are also incorporated into a patient's treatment plan to reduce the physical and cognitive functional deficits in survivors of critical illness following ICU discharge [15, 16]. One research study demonstrated that the more a patient is mobilized and the greater the activity level of the mobilization, the better a patient is able to survive their critical illness and liberate from the ventilator, independent of the patient's age, comorbidity and length of stay in the critical illness recovery hospital [17]. Critical illness recovery hospital patients may be ready to be liberated from the ventilator much earlier than expected thanks to a focus on achieving recovery goals by aligning and coordinating care [18].

## CIRHs provide specialized care not often focused on in the ICU.

This is particularly true for managing patients with weaning failure, whom CIRHs treat with specific evidence-based protocols for ventilator liberation. An interdisciplinary team experienced in treating patients on prolonged mechanical ventilation (PMV) can aid in decreasing ventilator-associated pneumonia, maintaining adequate nutrition and promoting post-weaning functionality.

CIRHs offer facilities and treatments that aid in the recovery, not just stabilization, of CCI patients. These include technologies seen in ICUs, but accompanied by specialists in a variety of areas. While the goal of an ICU may be patient stabilization for transfer to a unit of lesser acuity, CIRHs concentrate on returning a patient to the fullest recovery possible. This includes optimizing function and cognition through early initiation of physical therapy and interventions to deter delirium; nutritional support; prevention of infection; and integration of palliative care with restorative treatment. Because of the focus on recovery, when CIRH-appropriate patients are transferred from the ICU to a critical illness recovery hospital, it increases their likelihood of returning home [19].



*"my therapists encouraged me mentally and physically."*

## Select Specialty Hospital - Hampton Roads

Helen Ausink and her husband loaded their children into the car for a trip to North Carolina, heading down Interstate 95 to a family reunion. Not far from their home in Virginia, the car hydroplaned off the road and struck a tree. By the time ambulances arrived, Helen was unconscious and not breathing. ER doctors discovered bruising and hemorrhaging across her brain. In a coma and unable to breathe on her own, Helen was placed on a ventilator.

The former Army nurse spent 17 days in intensive care, battling pneumonia and other infections, before stabilizing. While she regained the ability to breathe, she was still unable to eat, care for herself or follow commands. She was also agitated, confused and unable to use the left side of her body.

Her family chose Select Specialty Hospital – Hampton Roads to begin the first phase of her recovery. A physician-led team of nurses, therapists and dietitians created a plan to heal Helen's body and mind.

Physical, occupational and speech-language therapists guided Helen through **stimulating exercises** aimed at reconnecting her cognitive abilities. Pharmacists routinely adjusted her medication, phasing out powerful drugs that might add to her sleepiness or confusion. As the days passed, she became more alert, actively participating in **muscle-building resistance exercises**.

After 12 days, Helen was thinking, moving and eating independently. She transferred to Riverside Rehabilitation Hospital, just two elevator stops down from Select Specialty Hospital – Hampton Roads. By then, Helen's children were regular visitors and participating in her physical and occupational therapy.

After 16 more days, Helen had made an astounding transformation. She was walking independently, performing self-care and felt confident taking care of her children's needs. She was so ready to get home, she joked, she packed her room on her own.

Recently, Helen returned to Riverside Rehabilitation Hospital to express her appreciation for her care team. "You have to keep a positive attitude. You have to keep moving forward. My therapists encouraged me mentally and physically. They encouraged my children's' participation, which meant a lot."

 RIVERSIDE  
Rehabilitation Hospital  
In Partnership with Select Medical

 Select  
SPECIALTY HOSPITAL

## What are the benefits of treatment at a CIRH?

CIRHs are fundamentally different from other post-acute care venues. An approach to equating CIRHs and non-CIRH patients was developed using a proprietary dataset with detailed clinical information relevant to making a decision about the next venue of care while patients were still in the ICU. (See sidebar). The results suggest that ICU patients denied CIRH-care for non-clinical reasons had a lower proportion surviving (i.e., higher mortality) at every time point persisting up to one year later. Further, the earlier in a patient's ICU stay that they were transferred to a CIRH, the greater long-term survival. Mirroring this result, other studies have shown chronic critically ill patients have improved one-year and five-year survival, lower readmissions and better functional independence when transferred to an CIRH early rather than to a SNF [20-25].

Many studies have also concluded that CIRH care lowers hospital readmission rates [22-23, 26-28]. CIRHs may aid in reducing overall recovery costs [29]. One study found that patients discharged to CIRHs had two-thirds the cost compared to an equivalent group of patients who remained in the ICU [19]. The reason may be due to earlier and more intense post-acute care at the CIRHs. When provided early in the course of care, CIRHs can allow patients to avoid longer stays in the ICU and SNF [30-33].

## LTACH Transfer Reduces Patient Mortality

A study of 56,910 patients meeting the criteria for LTACH admission looked at whether those patients who were ultimately admitted to an LTACH (n=32,409) had better survival rates than patients denied LTACH care. For patients on a ventilator, those treated at LTACHs had a **better survival rate** at all time points throughout the year-long follow-up. This survival advantage was most pronounced for patients on prolonged mechanical ventilation and who stayed in the ICU less.

It has also been demonstrated that CIRHs can optimize care for CCI patients. One longitudinal study followed 315 ventilated patients who were in a CIRH for six- and twelve-month follow-up after discharge from a CIRH [34] (see sidebar). The study concluded that “six months after discharge, improvement in muscle function enabled patients to perform daily activities, and 84.7 percent indicated a willingness to undergo mechanical ventilation again.” Other studies have found that CIRH patients have decreased long-term disability [35-36] and a lower complication rate compared to those seen in other acute care hospitals and SNFs [37].

## When should a patient be discharged from an ICU to a CIRH?

The decision to discharge a patient from an ICU to a critical illness recovery hospital depends on many factors. Appropriate criteria should include:

- 1: Physiological stability
- 2: Multidisciplinary and specialized weaning approach to prolonged mechanical ventilation
- 3: Ongoing high acuity nursing needs



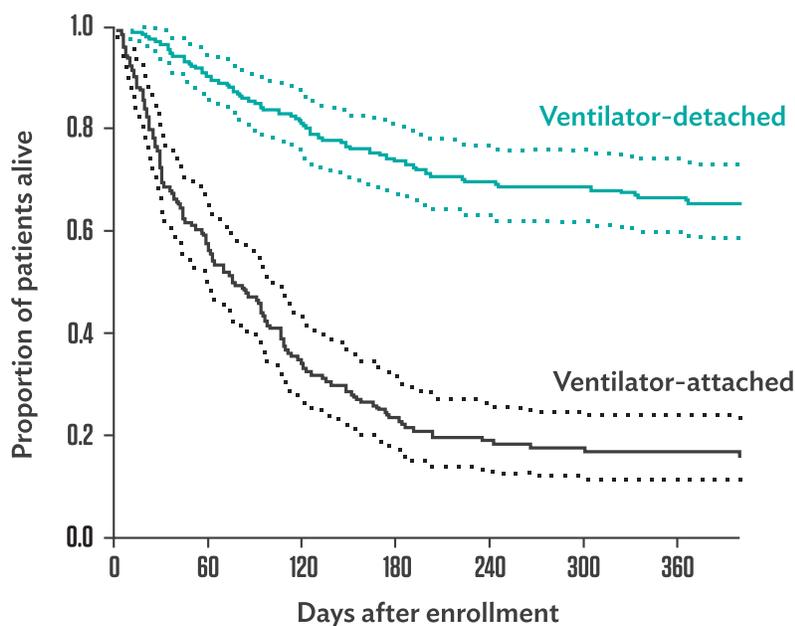
## Longitudinal Study of Outcomes After LTACH Discharge

This novel study looked at a number of long-term outcomes for patients in an LTACH who were being weaned from prolonged mechanical ventilation.

The ability to complete activities of daily living **improved by 64 percent** over six months follow-up and a quality of life indicator **improved by 32 percent**.

**Mortality was reduced** for patients successfully weaned from mechanical ventilation (see Figure 1).

**Figure 1:**  
Survival in ventilator-detached vs. ventilator attached patients in the Jubran (2019) study.



PATIENTS AT RISK		
Ventilator-detached	126	114
Ventilator-attached	34	24

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# CRITICAL ILLNESS RECOVERY HOSPITALS: *the* **RIGHT CHOICE** *at the* **RIGHT TIME**



EATING



BREATHING



WALKING



TALKING



THINKING

CIRHs concentrate on helping a patient **Eat, Breathe, Walk, Talk** and **Think** again. A multidisciplinary team works together to achieve these goals, with a single-minded focus on helping a patient go home. Sending patients to the right venue at the right time helps ensure effective care, including shorter hospital stays and a greater chance of long-term survival and functional independence.

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