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Implementation of an ICU Recovery Clinic at a Tertiary Care Academic Center

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Objectives: Post-ICU clinics may facilitate the care of survivors of critical illness, but there is a paucity of data describing post-ICU clinic implementation. We sought to describe implementation of our ICU recovery clinic, including an assessment of barriers and facilitators to clinic attendance.

Design: Adults admitted to the medical ICU of a large tertiary care academic hospital with shock and/or respiratory failure requiring mechanical ventilation were screened for participation in a newly formed ICU recovery clinic. Participant selection and attendance rates were tracked. Reasons for nonattendance were assessed by phone call in a subset of patients.

Setting: A newly formed ICU recovery clinic of a large tertiary care academic hospital.

Patients: All patients admitted to the medical ICU were screened.

Interventions: ICU recovery clinic appointments were scheduled for all eligible patients. A subset of nonattenders were called to assess reasons for nonattendance.

Measurements and Main Results: Over 2 years, we admitted 5,510 patients to our medical ICU. Three hundred sixty-two were screened into the recovery clinic. One-hundred sixty-six were not scheduled for clinic; major reasons included discharge to hospice/death in the hospital ($n = 55$) and discharge to a facility ($n = 50$). One-hundred ninety-six patients were scheduled for a visit and of those, 101 (52%) arrived to clinic. Reasons for nonattendance in a surveyed subset of nonattenders included patient's lack of awareness of the appointment (50%, $n = 9/18$), financial concerns (17%, $n = 3/18$), and transportation difficulty (17%, $n = 3/18$).

Conclusions: ICU recovery clinics may address the needs of survivors of critical illness. Barriers to clinic attendance include high mortality rates, high rates of clinic appointment cancellations and nonattendance, and discharge to locations such as skilled nursing facilities or long-term acute care hospitals. Improved communication to patients about the role of the clinic may facilitate attendance and minimize canceled appointments.

Key Words: acute respiratory distress syndrome; attendance; clinic; critical illness; nonattendance; sepsis

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There are more than 4 million Americans hospitalized with critical illness annually (1–3). Sepsis and acute respiratory distress syndrome (ARDS) are the two most common causes of critical illness. Due to advances in critical care, there are increasing numbers of survivors (3–5). However, emerging data demonstrate significant morbidity including long-term physical, cognitive, and neuropsychiatric impairments as well as mortality in survivors of sepsis and ARDS (6–13). Recent attention has been focused on improving the care of patients following critical illness in order to address these specific needs and optimize care delivery to this population (14–18).

ICU recovery clinics (also known as ICU survivor clinics, ICU follow-up clinics, and post-ICU clinics) are one potential way to improve care of survivors of critical illness. There are few published reports from ICU follow-up clinics; data from a few clinics around

the world are only now emerging (19–27). Given the need to improve recovery following critical illness, we started an ICU recovery clinic in July 2014. We report here the design and implementation of our recovery clinic over its first 2 years with an emphasis on barriers and facilitators to clinic attendance. Preliminary results from this study have been presented in abstract form at the American Thoracic Society and the Society of Critical Care Medicine (28–30).

MATERIALS AND METHODS

We implemented our recovery clinic at a large tertiary care academic medical center with a 33 bed medical ICU (MICU). Participants were recruited between July 2014 and June 2016. Patients 18 years old or older admitted to the MICU with shock and/or acute respiratory failure requiring mechanical ventilation for more than 24 hours were included. Patients who were bedbound or wheelchair bound prior to admission had active metastatic cancer or had received a palliative care/hospice consultation during their hospitalization were excluded. These groups were excluded based on consensus in our multidisciplinary group to try to enrich our recovery clinic for a population that might benefit from the clinic and to minimize clinic appointment burden in populations that are often followed closely by other physicians. Convenience sampling was used and an iterative multidisciplinary process was used to try to optimize attendance at the recovery clinic. This study was approved by the Wake Forest Institutional Review Board (IRB) with a waiver of consent (IRB 00031295).

Selected patients were identified and scheduled for a clinic appointment within 1 month following hospital discharge. The date, time of appointment and location were printed on the patient's discharge paperwork. Appointment reminders and an introductory letter regarding the clinic were sent through the mail and a phone call was made prior to their visit as well. The introductory letter regarding the clinic had three main points: 1) that survivors of critical illness often have trouble with physical, neuropsychologic, and cognitive impairments following critical illness; 2) that we wanted to try to help with their recovery process; and 3) that their medications would be reviewed at their visit. Structured clinic visits included evaluations by a clinical pharmacist and/or critical care pharmacy resident and a clinical assessment by a pulmonary/ critical care physician with or without the assistance of a pulmonary/ critical care fellow. The pharmacist component of the visit included medication reconciliation, evaluation, and counseling. Physician evaluations were then completed with an emphasis on postintensive care syndrome symptoms and other common problems following critical illness (e.g., weight loss), resolution of organ failures from their critical illness, and education about the recovery process. Clinic visits were concluded with a discussion of

recommended treatments, studies, and referrals. Finally, a copy of the clinic note was sent to the primary care physician to ensure continuity of care; typically, the patient was not followed in the recovery clinic.

Given high rates of clinic nonattendance, we also sought to better characterize reasons for nonattendance. All patients who did not attend their ICU recovery clinic appointments between January 2016 and June 2016 were contacted by phone to determine the reason for nonattendance.

For all analyses, descriptive statistics were used with mean (SD) and median (interquartile range) being reported. All statistical analyses were performed with Excel 2010 (Microsoft, Redmond, WA) and STATA SE 13.1 (StataCorp, College Station, TX).

RESULTS

Recovery Clinic Implementation

Revisions to the enrollment and scheduling process took place during the first 12 months of the project in order to try to improve our screening methodology and attendance and were based on a multidisciplinary team's ideas about potential improvements to the clinic, informal patient/family feedback, and team members' availability/ schedules. These changes included as follows: 1) timing of the clinic visit originally scheduled 7 to 10 days posthospital discharge was moved to 21 to 30 days posthospital discharge; 2) initial inclusion criteria of greater than or equal to 50 years old was modified to greater than or equal to 18; 3) initial inclusion criteria of mechanical ventilation for a minimum of 48 hours was changed to a minimum of 24 hours; 4) scheduling follow-up at the time of ICU discharge was moved to scheduling at the time of hospital discharge; 5) a pulmonary/ critical care fellow initially meeting with all patients screened into clinic was changed to no inpatient contact on the part of the ICU recovery clinic; and 6) screening responsibilities were transferred from a pulmonary/ critical care fellow to an ICU research nurse.

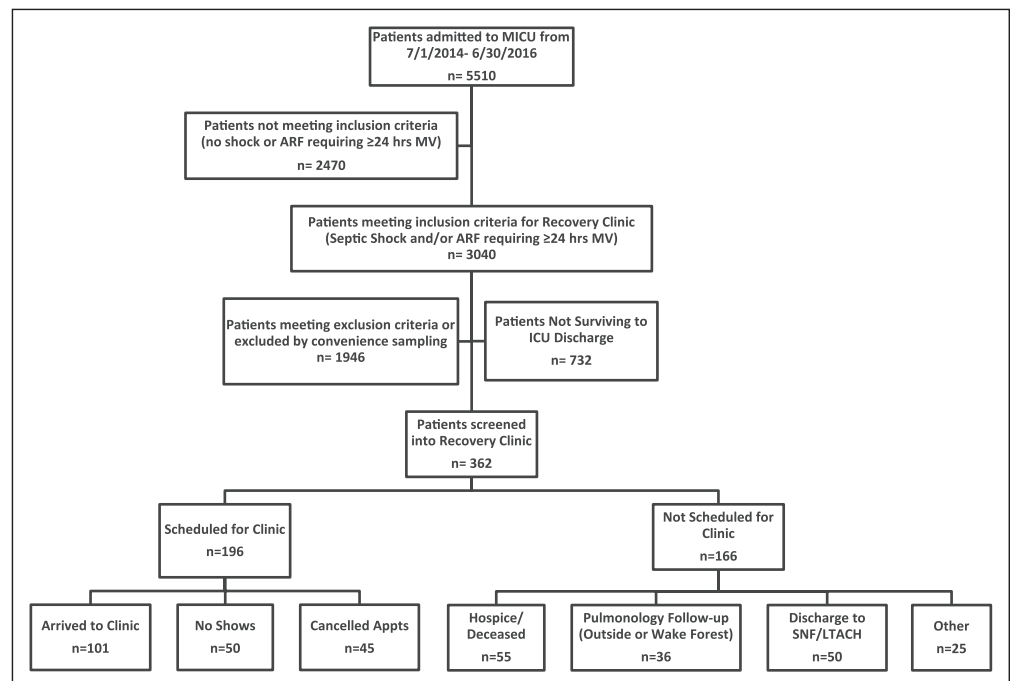


Figure 1. Flow diagram of ICU recovery clinic. ARF = acute respiratory failure, LTACH = long-term acute care hospital, MICU = medical ICU, MV = mechanical ventilation, SNF = skilled nursing facility.

Recovery Clinic Enrollment

Between July 2014 and June 2016, MICU patients were screened Monday through Friday (Fig. 1). Over 5,500 patients were admitted to the MICU over the 2-year period. Of these, 3,040 met the basic inclusion criteria for recovery clinic with shock and/or acute respiratory failure requiring invasive mechanical ventilation for at least 24 hours. Overall, 362 patients were screened into our ICU recovery clinic in its first 2 years.

Of these 362, 166 were not scheduled for clinic due to reasons including discharge to hospice/death in the hospital ($n = 55$), discharge to a facility ($n = 50$), other pulmonologist follow-up ($n = 36$), or other reasons ($n = 25$). A total of 196 patients were scheduled for ICU recovery clinic; 101 actually arrived to clinic. There were 50 nonattenders and 45 appointments that were

canceled. The patients were seen an average of 31 days following hospital discharge. The clinic's monthly attendance rate fluctuated between 14% and 100% with no discernable pattern (Fig. 2).

Recovery Clinic Nonattendance

Due to the high rates of clinic nonattendance, we sought to better characterize reasons for nonattendance in a subset of our clinic population. Between January 2016 and June 2016, 18 patients had documented nonattendance; all 18 were able to be contacted by phone. Fifty percent of patients reported that they were unaware of the ICU recovery clinic appointment. The other 50% were aware of their appointment, but did not attend due to lack of money ($n = 2$), lack of transportation ($n = 2$), concerns about insurance bills ($n = 1$), concern that the distance to travel was too far ($n = 1$), and other reasons ($n = 3$). Of nonattenders, 55.6% thought it would have been helpful to see a specialized ICU recovery clinic; 39% asked to reschedule their appointments.

DISCUSSION

Interest in ICU recovery clinics is currently high (16, 17). Care providers developing post-ICU clinics have a number of strategies to consider to optimize screening and maximize attendance. Our study demonstrates that an ICU follow-up clinic can be developed at a large, academic tertiary care hospital to provide care for this population. To our knowledge, this is one of few studies to provide details regarding implementation and facilitators and barriers to clinic attendance. As such, our study may help other sites construct a post-ICU clinic.

For other sites considering implementing post-ICU clinics, knowledge of site-specific barriers and facilitators to clinic screening and attendance will be crucial. Each site will need to develop their own methodology for enrolling patients into clinic. If a screening approach (rather than a referral-based approach) is taken, sites will need to be aware of high mortality rates, large numbers of discharges to facilities, and a high rate of clinic cancellations and nonattendance.

Our overall clinic attendance rate over these 2 years was 52%. This is on the lower side in comparison to other general clinics reported in the literature (highly variable ranging

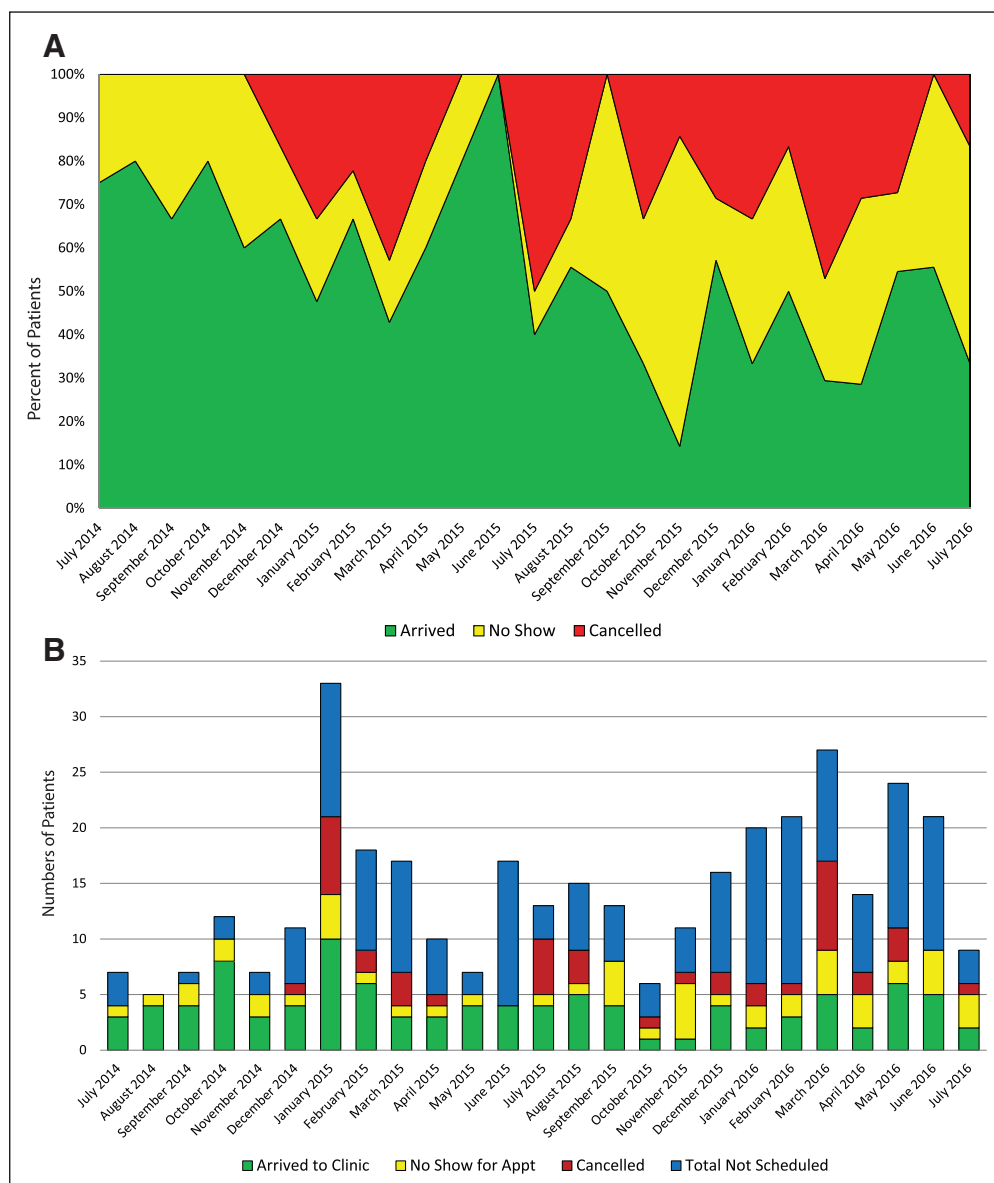


Figure 2. ICU recovery clinic attendance. **A.** Percent clinic attendance, nonattendance, and cancellations by screening month. Percentage of patients who attended clinic (green), canceled their clinic appointment (yellow), and did not attend their clinic appointment (red) is demonstrated by screening month. **B.** Numbers of patients with clinic attendance, nonattendance, cancellations, and no scheduled appointment by screening month. Numbers of patients who attended clinic (green), canceled their clinic appointment (yellow), did not attend their clinic appointment (red), and were not schedule for a clinic appointment (blue) is demonstrated by screening month.

from 50% to 95%) (31–33) and also compared with other clinics at our medical center (e.g., 82% attendance rate at gastroenterology clinic and 86% attendance rate at pulmonary clinic over the same time period). Notably though, this is similar to rates seen in other post-ICU clinics and may highlight the significant morbidity and mortality of this unique patient population (24, 34). Other studies examining transitions of care have also demonstrated variable clinic attendance rates—from 14% in a hospitalist-run transitions of care clinic, to 45% in a primary care-staffed transition clinic, to 70% following an admission for chronic obstructive pulmonary disease in Medicare patients in 2006 (35–37). It is not clear whether patients reports of being “unaware of their appointment” is a systems issue, a social desirability bias, a neurocognitive issue (whether it be memory, executive function, depression), a socioeconomic issue (e.g., truly did not have the money to drive a car to get to clinic and pay for parking), a physical function issue, or some combination of these.

It is possible that the timing of the clinic appointment, which was changed from 7 to 10 days post-ICU discharge to 21–30 days, is important as well. We made this change based on informal patient feedback that returning to the hospital for a clinic appointment a week later was difficult due to physical impairments and feeling over-burdened by appointments (e.g., physician, physical therapy, home health nurse). In other studies of posthospital follow-up interventions, the impact of the timing of the clinic appointment on readmissions and mortality has been mixed (38–42). Further studies are required to determine the impact of post-ICU clinic visit timing on attendance and long-term outcomes, including readmissions and mortality.

We have previously detailed the demographics of our 2014–2015 cohort (27), which is part of the complete cohort included in this study. It is possible that patient-level factors (e.g., presence of a caregiver, age, distance from the patient’s home to the hospital) also play a role in clinic attendance. Future studies may evaluate their effect on attendance, and thus inform implementation and future strategies to address barriers.

Potential facilitators to attendance include better communication regarding the appointment including letters more clearly detailing the rationale of the clinic and more and/or personalized reminders prior to the visit, as well as phone calls after missed appointments to allow for rescheduling of appointments (43, 44). Additionally, text messaging reminders for clinic appointments may be effective at increasing clinic attendance rates (45, 46). Potential barriers to clinic attendance include financial concerns and transportation difficulties. These barriers are well described in the literature regarding clinic attendance and are harder to address (47). Some novel approaches to transportation difficulties are currently being studied (48, 49). To address some of our barriers to attendance, our ICU recovery clinic has already implemented or is considering implementing several changes to provide better communication between the recovery clinic and patients, in addition to text message reminders for appointments, routine follow-up calls to nonattenders to determine interest in rescheduling an appointment, and addressing financial concerns by providing parking vouchers.

There are limitations to our study. First, our ICU recovery clinic used screening criteria, and these criteria changed over time. We

also used a combination of our evolving screening criteria with convenience sampling, so this may have introduced some bias in the patients screened into and/or seen in clinic. Finally, Wake Forest is a tertiary care referral center with a large geographic referral radius that results in significant travel distances; this may or may not be generalizable to other centers.

CONCLUSIONS

Our report demonstrates that creation of a post-ICU clinic for survivors of critical illness is feasible at a large U.S. academic medical center. We had a low attendance rate at our center due to death, financial concerns, and poor communication. Improved communication to patients and surrogates about the goal of ICU clinics may be a surmountable barrier to improve attendance. These data may help other centers implementing post-ICU clinics.

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