

# Bridging the Gap: A Multidisciplinary Approach to Transitions of Care

*Section Editor*

Traci Houston, RN, MS

Susanne McDevitt, MSN, ACNP-BC

*University of Michigan Pulmonary*

*Hypertension Program*

*Ann Arbor, MI*

Claire Walter, PharmD, BCPS

*University of Michigan Pulmonary*

*Hypertension Program*

*Ann Arbor, MI*

## INTRODUCTION

Pulmonary hypertension (PH) is a chronic, progressive heterogeneous disease that affects many individuals worldwide. Despite extensive research and therapeutic advances in the treatment of PH, the morbidity and mortality rates remain high, and this bears a significant economic burden on the health care system. PH-related morbidity is associated with disease progression and often requires hospitalization, which may be considered an important measure of clinical worsening.<sup>1</sup> Current US third-party reimbursement systems can penalize hospitals for hospital readmission. A coordinated multidisciplinary approach to hospital discharge is required for patients with PH.

## HOSPITALIZATION AND PH

Approximately 200,000 hospitalizations occur annually in the United States with PH as a primary or secondary diagnosis.<sup>2</sup> Using the National Inpatient Sample Database to identify PH or cor pulmonale as the primary discharge diagnosis from 2000 to 2013, the authors found increased admissions for PH in terms of absolute numbers, mean length of stay, and hospital charges.<sup>3,4</sup> In fact, the overall cost of hospital visits of a patient increased by 209.5% from \$301,324,218 in 2000 to \$932,554,725 in 2013.<sup>4</sup> These inpatient costs associated with PH contribute significantly to the total health care burden. With advances in PH treatment options and increased use of combination therapy, medication

costs are rising. However, these medication costs may be counterbalanced by reduction in hospitalizations.<sup>5</sup> Further research on cost-effective evaluation and management of PH is required.

Recent studies demonstrate that clinical worsening including all-cause hospitalization is associated with worse outcome.<sup>6</sup> Indeed, PH-related hospitalizations have been associated with a higher mortality rate in clinical care<sup>7</sup> and generally lead to higher health care costs related to diagnostic procedures and medications.<sup>8</sup> The REVEAL registry showed that a first hospital admission within 1 year of diagnosis portended a high likelihood of rehospitalization.<sup>8</sup> Another study noted 42% of hospitalized PH patients had at least 1 rehospitalization within the first year after discharge, some having numerous readmissions.<sup>5</sup> In addition, intensive care unit admission for PH has been associated with poor survival after discharge, with older age, baseline right heart failure, and severity of organ dysfunction as independent predictors of long-term mortality.<sup>9</sup> Close follow up is recommended for PH patients who survive critical illness. Moreover, particular caution should be used with PH patients hospitalized who are managed with parenteral prostacyclin therapy with regard to patient safety. Current studies demonstrate risk of serious and even fatal errors with intravenous prostacyclin therapy and recommend the development of standardized policies and treatment guidelines for each institution to reduce patient risk.<sup>10</sup>

Pulmonary arterial hypertension (PAH) treatment, including upfront combination therapy, may decrease morbidity and clinical worsening.<sup>5</sup> For example, in a post hoc analysis of the AMBITION trial, upfront combination therapy resulted in a 63% risk reduction for hospitalization related to PAH.<sup>11</sup> For every 9 patients treated with combination therapy, 1 hospitalization due to PAH may be prevented over 1 year's time.<sup>11</sup> Efforts to reduce hospital readmission rates may positively impact morbidity, mortality, and health care system financial burden. Increasing attention should be directed toward reducing PH readmissions and, importantly, identifying patients with the highest risk for readmission. By implementing individualized, multidisciplinary discharge planning early in hospital admission with a detailed plan for transitional care and close follow up, PH readmission rates may be positively impacted. The use of tools and checklists may enhance the PH team's ability to provide consistent, comprehensive posthospitalization care.

## DISCHARGE PLANNING

Transition from hospital to home is deemed a high-risk period where patients may be at risk for developing adverse events during postdischarge phase.<sup>12</sup> Generally, the information that must be relayed at hospital discharge is often complex and overwhelming. Lack of clear communication has been implicated as a common finding, and pertinent information may not be sent to outpatient pro-

viders, which may have a negative impact on follow-up plan. Strategies to support patients returning home and to facilitate communication of information to local health care providers, including educating patients to carry a record of discharge summaries to local provider visits, may improve patient self-management and reduce rehospitalization.

Studies in heart failure and other medical illnesses have demonstrated that a single intervention is not sufficient to address the multifaceted discharge needs of complex patients.<sup>13</sup> Transition of care from inpatient to outpatient care should be individualized and multidisciplinary. Discharge planning should begin at the time of admission, including assessing patient and family knowledge, adherence to medical plan, and ability to manage care regimen. Often, important discharge information, such as medication changes and self-care strategies, is discussed at the time of discharge. This is a suboptimal time for patient education. Allied health personnel including advanced practice providers, pharmacists, nurses, and discharge planners are optimally suited to develop a plan of care for each patient, including self-care education plans for the patient and family to reduce risk of readmission.

Self-management and patient education are key components of discharge planning after hospital admission. Disease self-management is described as tasks an individual undertakes to live well with a disease condition, including medical management, learning meaningful behaviors and roles, and managing emotions of having a disease such as fear, anger, depression, and frustration.<sup>13,14</sup> This requires gaining an understanding of the disease, developing skills to manage treatment regimens and problem solve, making and maintaining lifestyle changes, and coping with a myriad of emotions. This may require changes in usual activities and finding additional support such as classes, counselors, medical team consultation, and support groups. Nurses in the hospital have numerous opportunities to make an impact on self-management skills for patients and families, as they have significant expertise in disease management, medication adherence, dietary modifications,

social support, and symptom control. The inpatient PH nurse practitioner or physician assistant also plays a key role in developing and implementing the transition of care plan.

Heart failure literature has demonstrated the importance of specific education to facilitate self-care and management. A review of 35 educational intervention studies in heart failure found that disease-state knowledge, self-monitoring, medication adherence, time to hospitalization, and days in the hospital improved with patient education.<sup>15</sup> Similarly, PH patients need to learn how to monitor and report their symptoms and weight fluctuations, restrict sodium and fluid intake, adhere to medication regimens, and maintain physical activity. Clearly, education prior to discharge reduces readmissions and associated health care cost.<sup>16</sup> Nurses and allied health personnel are critical to the success of patient education.

Discharge planning and education for the PH patient should be multidisciplinary and may include cardiologists or pulmonologists, advanced practice providers, nurses, pharmacists, social workers, physical and occupational therapists, specialty pharmacy staff, and discharge planners. It is crucial to clearly define the roles that each team member will play in the patient's care. There should be a plan for close communication with members of the outpatient PH team. For patients who have initiated new PH-specific medications, discharge planning should include completion of insurance prior authorization and approval, documentation of copay amount and affordability, referral and acceptance for copay assistance programs, and identifying a specific outpatient pharmacy to provide the medication immediately upon discharge. This will avoid inadvertent discontinuation of PH-targeted medications after discharge, which can lead to clinical worsening and rehospitalization.

The development of discharge education checklists, teach-back materials, hospital television videos, and written take-home materials may be useful to support educational efforts. Implementing a process to incorporate appropriate amounts of teaching on a daily basis may affect the patient's ability to man-

age their disease more independently. Hospital discharge instructions should include standard PH-specific instructions for symptom management and contacting the outpatient PH care team. Ideally, these discharge plans are delivered to the patient by a member of the PH care team or a bedside nurse with PH expertise and training.

Psychosocial factors may also affect PH hospital readmission rates, as has been demonstrated in the heart failure population. Low health-related quality of life has been shown to be a predictor of readmission, and this may be similar in a PH population.<sup>17</sup> Review of the PAH literature demonstrates depression rates of 7.5% to 53% and anxiety and panic disorder rates of 19% to 51%.<sup>18</sup> In fact, PH-specific patient-reported outcome tools have been increasingly used in various settings and may be incorporated into hospital discharge workflow, posthospitalization follow-up visits, routine outpatient appointments, and hospitalizations to guide education and treatment. Recent European Society of Cardiology recommendations include psychological support for PH patients as a class I recommendation.<sup>19</sup> In general, patients with depression are less likely to adhere to medication regimens and lifestyle modifications, which may increase risk for hospital readmission. While addressing acute medical illnesses takes precedence during hospitalization, consideration for assessment of depression should be considered. Screening for depression is an important component of care planning, and nurses may be best suited to facilitate screening and potential interventions. While numerous tools exist for depression screening, each institution may provide guidance on a preferred screening method. Similar to patient education, a multidisciplinary approach to depression intervention is recommended. A basic understanding of depression is necessary for nurses to understand its effect on adherence to treatment and contributions to hospitalization. Nurses are able to support patients and families to alleviate symptoms and educate on the importance of social support after discharge. Given a paucity of data on treatment approaches for depression in PH, methods used

in other chronic illnesses have been suggested, including relaxation training, breathing techniques, and cognitive behavioral therapy.<sup>18</sup> Without question, mood disorders are underdiagnosed in PH, and the impact on overall morbidity and mortality are not understood.

## TRANSITIONAL CARE AND FOLLOW UP

Multidisciplinary planning for transition from inpatient to outpatient setting is imperative. Coordination and collaboration between settings is critical to improve patient outcomes and reduce readmissions. Transitional care programs include patient and family education, telephone follow up, early clinic follow up with early reassessment of medications and clinical status, while including caregivers and postdischarge providers.<sup>13</sup> Successful transitional care in heart failure patients included 8 common themes: planning for discharge; multiprofessional teamwork, communication, and collaboration; timely, clear, and organized information; medication reconciliation and adherence; engaging social and community support groups; monitoring and managing signs and symptoms after discharge; and delivering patient education, outpatient follow up, advanced-care planning, and palliative and end-of-life care.<sup>20</sup> Home nursing visits, nursing case management including structured telephone support, and follow up in specific disease management clinics have been shown to decrease readmissions compared with usual care.<sup>16</sup>

Structured telephone follow up after hospital discharge by a nurse clinician is a simple, cost-effective method of assessing patient status and wellbeing, reviewing key discharge education and instructions, and identifying issues that may lead to poor outcomes.<sup>21</sup> This may address numerous concerns in a high-risk population and should be implemented ideally within 48 hours of discharge. Studies demonstrate telephonic intervention has the greatest impact on avoiding readmission when implemented as close to discharge date as possible.<sup>20</sup> The initial phone call may include determining whether prescriptions have been filled appropriately, durable medical equipment has been obtained, daily monitoring is

occurring, disease and symptom management education may be reviewed, and any adverse events can be identified and reported to PH providers. Education regarding the purposes of each medication, dose adjustments and frequency, and how to take them appropriately are important basic areas essential to patient self-management. Consideration of a posthospital discharge telephone checklist such as the “Pulmonary Hypertension Posthospital Discharge Telephone Checklist” (Appendix 1, courtesy of the University of Michigan Pulmonary Hypertension Program) may be valuable to ensure comprehensive, consistent assessment. Ideally, a member from the PH program team completes this checklist. The length of hospital stay, acuity on admission, comorbidity, and emergency department visits (LACE) risk score identifies patients that are at risk for readmission or death within 30 days of discharge.<sup>22</sup> The PH nurse is critical in teaching patients when to contact the office related to worsening of PH symptoms. Educating PH patients and providing written information regarding “When to Call Your Doctor” (Appendix 2, courtesy of the University of Michigan Pulmonary Hypertension Program) may serve as a proactive tool to reduce need for hospitalization.

Posthospitalization follow-up clinic visits or virtual video visits may be instituted within 2 weeks of discharge. Similar to initial telephone follow up, overall disease, symptom, and medication education may be provided, while assessing clinical condition and any adverse events. Self-management strategies can be reinforced to patient and family, and consideration for additional physical and psychosocial support may be addressed. Prompt hospital discharge follow up has been linked with decreased rehospitalization rates, emergency department use, and death.<sup>23</sup>

Palliative care may be offered simultaneously with disease-oriented care to support chronic symptom management and improve quality of life for patients and families with PH. Palliative care has been demonstrated to improve communication among patient, family, and provider as it forces open discussions about disease, therapeutic challenges, and patient wishes.<sup>24</sup> Palliative care may

be underused in PH as the need is often not recognized by health care providers and may be considered much earlier in the disease trajectory to provide additional support.

Of note, PH patients may not be able to maintain employment due to chronic symptoms and lifelong illness, necessitating Social Security Disability status, affecting income and resources. As is understood in heart failure patients, those with lower socioeconomic status may be at higher rates of acute heart failure readmission, possibly related to low income and literacy rates, lack of insurance and social support, and substance abuse, which affect self-management.<sup>25</sup> These factors may also be considered higher risk findings in the PH population, as these patients may have increased likelihood to experience high readmission rates, consume high levels of resources, and may overuse emergency department visits, resulting in more fragmented health care.

## CONCLUSIONS

The hospital discharge process is a complex, multifaceted plan that should begin on the first day of admission. Just as standardized treatment protocols can improve patient outcomes, a similar plan for multidisciplinary discharge planning may enhance safe transition from hospital to home. Daily teaching provides an opportunity to assess information carried over and accurate understanding of treatment plans, as well as to review changes in care plans that may be evolving during a hospitalization. Use of checklists and documentation of patient education may be useful. Prevention of PH rehospitalization may improve patient outcomes and reduce health care system financial burden. Further study is warranted to elucidate PH patient-specific factors and interventions that may reduce rehospitalization rates.

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## APPENDIX 1.

### Pulmonary Hypertension (PH) Posthospital Discharge Telephone Checklist (To Be Completed With Patient and Caregiver)

1. Assess overall status:
  - a. Better, worse, or same since discharge? Consider for all patients and especially those with high LACE scores.<sup>a</sup>
2. Assess patient's home care:
  - a. Is the patient receiving any care at home (nursing, PT/OT, other)?
  - b. What is the phone number for organization?
3. Discuss home arrangements:
  - a. Are arrangements made at job?
  - b. Are arrangements made for caregiver support?
4. Review any follow-up appointments:
  - a. When are the next appointments (primary care physician [PCP], referrals to other specialists, pulmonary rehabilitation, etc.)?
5. Consider contacting PCP with discharge plan and instructions for continuity.
6. Discuss home medical equipment:
  - a. Did the patient receive any necessary equipment, oxygen, walker, hospital bed, bedside commode, other?
  - b. What is the phone number for provider?
7. Assess high-risk symptoms:
  - a. Explain potential symptoms, how to monitor, what to expect while at home, who to call during office hours and afterwards, and under what circumstances patient should visit the emergency department.
8. Assess medications:
  - a. Review list of all medications including dose, frequency, over-the-counter and herbal supplements.
  - b. Review name and phone number of who to call for questions.
  - c. Review new medications or changes in dosage thoroughly. Have new prescriptions been obtained? Any concerns with new prescriptions or cost?

9. Review self-management strategies:
  - a. Review daily weight monitoring (how it should be done, how to record, etc.).
  - b. Review dietary restrictions, exercise recommendations, etc.
10. Provide teach-back as appropriate.<sup>b</sup>
11. If necessary, arrange outpatient investigations (laboratory, radiology, etc.).
12. Develop method to obtain information from postdischarge providers (PCP, in-home clinical support, specialty pharmacy, other).

13. Assess for signs of stress and depression, including patient and caregiver.
  - a. Review psychosocial resources such as social work, support groups, PH peer mentors, recommended online support groups, and contact information.
14. Review recommended online resources, such as phassociation.org and phaware.org, and organizations that may provide financial support for medication access.

<sup>a</sup>LACE index is a score calculated based on 4 factors: (L) length of hospital stay, (A) acuity on admission, (C) comorbidity, and (E) emergency department visits. A score of 10+ indicates high risk for readmission to hospital.

<sup>b</sup>Teach-back is the process of explaining information to patients and asking them to restate the information to assess accuracy. The instructor then repeats the process until the patient demonstrates correct recall and comprehension.

## APPENDIX 2.

### Pulmonary Hypertension (PH) Program: “When to Call Your Doctor”

#### Call 911 for:

- Severe shortness of breath.
- Loss of consciousness (pass out).

#### Contact the PH program staff for any of the following:

- You experience a weight gain of 2 pounds in 1 day or 3 pounds in 3 days.
- You develop new or increasing swelling of the legs, feet, or abdomen.

- You develop new or increasing shortness of breath that lasts for more than 3 days.
- You experience unusually high or low urine output.
- You experience a “blackout spell” or an episode of lightheadedness.
- You experience an increase in overall fatigue.
- You develop new or increasing palpitations or heart fluttering.
- You have uncertainty or questions regarding your PH medication.

- You develop new or worsening side effects from your PH medication.
- You develop signs of a central line infection.
- You change your insurance or cannot get your PH medications.

#### Contact your primary care physician when:

- You have symptoms of upper respiratory or other infection.
- You need refills or have questions regarding non-PH medications.