The Annenberg Academy for Team-Based Care

Interprofessional Care of Patients with Hepatorenal Syndrome- Acute Kidney Injury

MANAGING PATIENTS WITH HRS-AKI: KEY CONCEPTS

Hepatorenal syndrome (HRS) represents an acute complication of decompensated cirrhosis and is a subtype of acute kidney injury (AKI).[1-4] HRS results from portal hypertension activating renal vasoconstriction and reduced kidney function.[5] The development of portal hypertension is caused by increased intrahepatic resistance and splanchnic arterial vasodilation. Splanchnic vasodilation results in decreased circulating central blood volume, causing an upregulation of the renin-angiotensin-aldosterone system, sympathetic nervous system, and anti-diuretic hormone. The results are increased sodium and water retention, augmented cardiac output, and increased renal vasoconstriction. With a mortality rate ranging from 29% to 40%,[6-9] coupled with acute hemodynamic shifts, the management of patients with HRS-AKI remains challenging.

Key concepts to keep in mind when managing patients with HRS-AKI are:

- Diagnostic criteria for HRS-AKI released in 2024 focus on an increase of serum creatinine from baseline and lack of kidney function improvement following adequate volume resuscitation when clinically indicated.[10]
- To address the pathophysiologic abnormalities of HRS-AKI, differential effects of vasoconstrictor therapy include splanchnic vasoconstriction, systemic vasoconstriction, decreased hepatic artery and portal vein flow, and increased renal perfusion pressure.[10-12]
- The 2021 American Association for the Study of Liver Diseases practice guidance and 2024 Acute Disease Quality Initiative/International Club of Ascites consensus meeting recommend first-line initiation of vasoconstrictor therapy, preferably terlipressin, to be used in combination with albumin. Additional vasoconstrictor options include the use of norepinephrine or midodrine and octreotide.[10,12]
- The administration of terlipressin does not require central venous access and may be performed on the general medical ward. An oxygen saturation level should be obtained prior to the first dose of terlipressin due to a risk of respiratory failure.[5,10,12,13]
- The administration of norepinephrine requires central venous access and admission to high level or intensive care for titration and monitoring. In a patient with respiratory failure and peripheral access, the combination of midodrine and octreotide may be considered as a treatment option.[10,12,14]
- Since patients with cirrhosis who have experienced an episode of HRI-AKI remain at increased risk of recurrence, progression to chronic kidney disease, and mortality, hepatology-nephrology follow up is recommended upon hospital discharge.[10,12]

INTERPROFESSIONAL COLLABORATION: PRINCIPLES

For the evolution in treatment to be of optimal benefit to patients, comprehensive strategies for choosing, delivering, monitoring, and modifying therapy have become especially important. As a consequence, care is typically provided by an interprofessional, multidisciplinary care team that extends beyond physicians to include nurses, nurse practitioners, pharmacists, physician associates, social workers, and others, often involving collaboration between providers in community and academic settings.

To that end, the following reflects a conversation among 3 healthcare professionals about interprofessional care and how collaborative practices and teams can strengthen our health systems.

Christopher Flores, MD: In medical school, I was taught that the patient-doctor relationship was the most critical and important dynamic in healthcare. But after 30-plus years in clinical care, I can attest that healthcare is a team sport and we deliver care in teams of individuals with different training, different skills, different talents. And we teach each other, we learn from each other, we brainstorm and solve problems to meet the needs of the patient.

I want to make a point that interprofessional refers to clinicians in different professions, such as nurses, nurse practitioners, pharmacists, physicians, and physician associates. Multidisciplinary refers to clinicians in different specialties or sub-specialties, such as cardiology, dermatology, and oncology. LaTosha, do you want to talk about interprofessional collaboration?

LaTosha Mollette, DNP: The World Health Organization defines interprofessional collaboration as when multiple healthcare workers from various backgrounds work together with patients, families, and communities to provide the best healthcare possible.[15] This is exactly what teamwork should look like, but it is important to remember that healthcare teams can vary from patient to patient.

I work in a rural setting, working together with various healthcare professionals to improve access to needed healthcare services, which helps to prevent unnecessary delays in care and treatment. Ultimately, working together as a team helps to meet the needs of others to improve health outcomes, patient care, and safety.

Christopher Flores, MD: I think all of us in healthcare are trying to figure out how to do things better, make life easier for ourselves, and make everybody happier, patients, our staff, and ourselves, to make things more sustainable. Interprofessional collaboration can accomplish this. There's a growing body of literature that shows that interprofessional collaboration can improve patient outcomes, acceptance of treatment, and satisfaction.[16-19] It can decrease costs, improve efficiency, reduce disparities, improve health equity, and make things more sustainable for providers.[16,20-27]

The Interprofessional Education Collaborative has identified 4 behavioral competencies for effective interprofessional collaboration: 1) roles and responsibilities; 2) values and ethics; 3) communication; and 4) teams and teamwork.[28] Michael, do you want to talk a little bit about the roles and responsibilities?

Michael Smith, PharmD: Certainly, it's one of these things that we don't often think about, but it's important for 2 reasons. One, understanding our own responsibility and roles that we have within our team and what our teammates can expect from us in terms of what we can deliver to them and deliver to patients.[28] The other is understanding what your team can do for you as well, so that you understand their educational background and you can help them practice at the top of their license by utilizing their skillset to the fullest extent.

It is increasingly common for clinicians, even those within a profession, to take different educational and practice paths leading to clinical practice. As an example, there are various differences in training a pharmacist. Nowadays, all pharmacists graduate with a Doctor of Pharmacy degree (PharmD), but some of us have done 1 or 2 years of residency training or postdoc fellowships. So, getting to know your teammates and what you can expect from them and what they can expect from you can really help your team function at a high level.

Christopher Flores, MD: We talk about values and ethics as well.[28] In medicine, we're constantly required to make very difficult and complicated treatment decisions for our patients. We really are missing a great opportunity if we don't involve the opinions of all the members of our team. What does the nurse think about this plan or what does the social worker who has talked to the family members think about this plan? Or what does the physical therapist think, who has been working with the patient for the last 3 days? LaTosha, what do you think about communication?

LaTosha Mollette, DNP: Communication is essential in everything we do, and it's how we're able to effectively achieve goals, as well as improve relationships and interactions with others.[28] The healthcare system is often described as being fragmented with little communication and collaboration, but when healthcare professionals communicate responsibly and respectfully, this allows them to overcome differences and work together to accomplish a shared goal, including learning from each other, to better improve patient outcomes and safety.[21,29-31]

Christopher Flores, MD: We're talking a lot about teams and teamwork. Michael, do you have any other points you want to make about teamwork?

Michael Smith, PharmD: Most of us are members of various teams during the course of a typical day. Think about the team members that you work with to take care of patients, but also think about a team from a networking standpoint. Do you have a network of like colleagues? As an example, other pharmacists in our healthcare system may reach out to me for advice about a patient with pain, whether or not I'm actually seeing the patient. We can make our team small, we can make them big, but we should be making our teams in ways that everybody's functioning at a high level and putting the patient at the center of the team.

Christopher Flores, MD: Michael, LaTosha talked about the fragmented healthcare system and how interprofessional collaboration can help with that. Do you have any examples from your experience?

Michael Smith, PharmD: Think about the patient's experience through our healthcare system. Even if a patient receives all of their healthcare within 1 system, they often have to travel to many different places just to access care. From a primary care clinic to a hospital, to a specialty clinic, to a pharmacy. We can fill these gaps by using our interprofessional framework, our education, and allowing our collaborative practice teammates to step in and fill that.

Christopher Flores, MD: In conclusion, I just want to summarize that medicine is a team sport and that there is a growing body of evidence that supports the various benefits of interprofessional collaboration. LaTosha, Michael, do you have any final thoughts?

LaTosha Mollette, DNP: I think just being willing to change is crucial. I think sometimes we have become complacent in clinical practice, but our healthcare system is ever evolving. So, learning how to be a team player always benefits everyone involved.

Michael Smith, PharmD: I've learned a great deal from my interprofessional colleagues, and I hope that I've helped them learn as well, with the ultimate goal of really improving patient care.

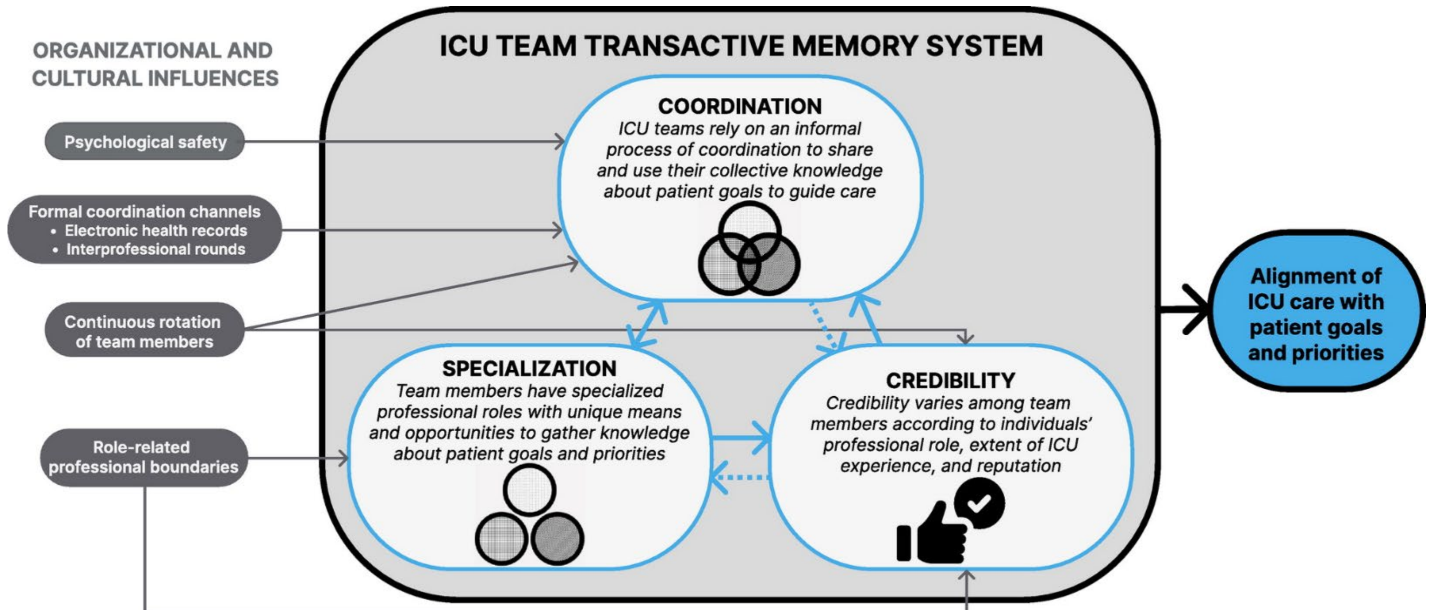
INTERPROFESSIONAL CARE OF PATIENTS WITH LIVER DISEASE

The importance of relationships among the interprofessional, multidisciplinary healthcare team was recently demonstrated by an ethnographic study of 4 intensive care units in 2 community hospitals and 1 academic medical center.[32] Investigators found that team members became familiar with other team members through: 1) time spent working together; 2) social interactions allowed teams to become more familiar; 3) trust and respect supported familiarity and, in turn, effective team function; and 4) open communication. Both time spent together and open communication were foundational.

Beyond relationships and open and effective communication, the Interprofessional Education Collaborative also identified teams and teamwork as a core behavioral competency for effective interprofessional collaboration.[28] However, less is known about how and to what extent different professions on an ICU team work together to deliver care that is aligned with patient goals and priorities. While conducting a study to map ICU care processes for acute respiratory failure, Kruser et al found evidence of latent knowledge-sharing processes among the interprofessional ICU care team to deliver goal-aligned patient care.[33] Further analysis suggested that collaboration within ICU teams resembles transactive memory system (TMS) theory. First observed in successful long-term marriages, TMS explains how high-performing teams develop a group mind with a shared memory system, extending the cognitive capacity of any individual team member.[34] Based on their analysis, Kruser et al organized their findings by the three major components of TMS, ie, specialization, credibility, and coordination **(Figure)**. They found that, when ICU team members recognize and value the specialized role of each team member, they view other team members as credible. In turn, credibility promotes sharing of knowledge through an informal coordination process, often side conversations which, when successful, enables each team member to carry out their specialized role. Conversely, if these specialized roles are not recognized or valued by other team members, care coordination is disrupted. Organizational and cultural factors found to negatively influence TMS within the ICU setting included role-related professional boundaries or hierarchy, continuous rotation of team members, limited psychological safety, and inadequate formal channels of coordination, eg, electronic health records and interprofessional rounds.

As for patients in the ICU, interprofessional, multidisciplinary care clinics are increasingly being introduced in the outpatient setting to streamline complex care and improve patient outcomes and the patient care experience. Lim et al recently provided their recommendations to navigate the complex logistics of establishing and maintaining an interprofessional, multidisciplinary hepatology outpatient clinic.[35]

Figure. A model of transactive memory systems in the intensive care unit.[33]



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