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Promoting Sustainable Kidney Health: The Asia-Pacific and Beyond

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Volume Measurement and Management in AKI

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In the realm of acute kidney injury (AKI) management, both hypovolemia and hypervolemia bear significant clinical implications. Hypovolemia, characterized by a reduction in extracellular fluid (ECF), diminishes organ perfusion, thereby precipitating dysfunction. Conversely, hypervolemia induces organ edema, further exacerbating dysfunction. The dichotomy between these conditions dictates disparate therapeutic strategies, determining whether fluid resuscitation or fluid removal is warranted. However, prior to formulating treatment plans, it is imperative to grasp the nuanced concept of the four phases: rescue, optimization, stabilization, and de-escalation. Treatment modalities are contingent upon the phase in which the patient resides. During the optimization-stabilization phase, meticulous evaluation of fluid responsiveness is paramount, guiding therapeutic interventions. Assessment of tissue hypoperfusion can be conducted through comprehensive physical examination and monitoring of urine output. Meanwhile, the precise evaluation of stroke volume can be achieved utilizing sophisticated methodologies such as echocardiography or arterial waveform analysis. Moreover, less invasive techniques including fluid challenge or passive leg raising may be employed to assess fluid responsiveness. In addressing hypervolemia, medical interventions or ultrafiltration may be warranted to effectuate fluid removal. The utilization of VExUS (venous excess US) presents a non-invasive means of evaluating venous congestion, thereby informing therapeutic decisions. Undoubtedly, the assessment of volume status in critically ill AKI patients is of paramount importance, necessitating a multifaceted approach encompassing diverse methodologies. It is incumbent upon clinicians to tailor treatment strategies according to the patient's clinical status, thereby optimizing therapeutic outcomes.

Keywords: Four phases, Fluid responsiveness, Venous excess US, Fluid resuscitation, Fluid removal