The physiology–profile–plan framework: a physiology-based, ultrasound-guided approach to individualized shock resuscitation

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Background: Shock is a complex condition where similar vital signs at the bedside can actually reflect very different underlying physiology. While protocol-driven management helps stabilize early, it can sometimes mismatch treatment to the patient's actual physiology, especially in undifferentiated shock. This can lead to avoidable harm, such as fluid overload or using the wrong vasoactive medications.

Objective: To introduce a practical, physiology-based framework that uses bedside ultrasound to help tailor early assessment and treatment for patients in shock.

Methods/Framework: After reviewing the subject, we introduce the Physiology–Profile–Plan (3Ps) framework, a quick, repeatable clinical process that complements Airway, Breathing, and Circulation resuscitation. The first step, Physiology, is to identify the main cause of shock, such as pump failure, vasodilation (pipe failure), volume loss, obstruction, or a combination of these. Profile creates a real-time picture of the patient's hemodynamics by combining clinical exams with various types of monitoring, with a focus on point-of-care ultrasound. Important ultrasound checks include evaluating left- and right-ventricular function, assessing volume status with venous findings and dynamic tests such as the passive leg raise with Doppler, and assessing fluid tolerance using lung ultrasound for signs of interstitial syndrome and markers of high filling pressures or venous congestion, when possible. Plan then uses this information to guide targeted treatment and ongoing reassessment.

Clinical Application: Fluid management is guided by three main questions: Does the patient need fluid? Will they benefit from fluid (will it increase blood flow)? Can they handle the fluid safely? Based on these answers, the framework helps choose the right treatment for each type of shock. For example, it suggests early vasopressors with careful fluid use in vasoplegic shock, avoiding too much fluid and using inotropes or diuretics in cardiogenic shock, giving small fluid boluses with frequent checks if the patient is fluid responsive, using minimal fluids with specific vasoactive or inotropic support in right ventricular failure, and combining these approaches for mixed shock types.

Conclusion: The 3Ps framework puts precision resuscitation into practice by clearly connecting the cause of shock, bedside hemodynamic assessment, and flexible treatment. It could help improve decision-making and reduce the risk of treatment-related harm, but it requires skill with ultrasound and needs further testing.

Keywords: Shock, ultrasound, resuscitation.