

Supplemental references (S1 – S4)

1. Darmon M, Vincent F, Dellamonica J, et al. Diagnostic performance of fractional excretion of urea in the evaluation of critically ill patients with acute kidney injury: a multicenter cohort study. *Crit Care*. 2011 Jul 27;15(4):R178. doi: 10.1186/cc10327.
2. Kato R, Pinsky MR. Personalizing blood pressure management in septic shock. *Ann Intensive Care*. 2015;5(1):41. doi: 10.1186/s13613-015-0085-5.
3. Chen CY, Zhou Y, Wang P, Qi EY, Gu WJ. Elevated central venous pressure is associated with increased mortality and acute kidney injury in critically ill patients: a meta-analysis. *Crit Care*. 2020;24(1):80. doi: 10.1186/s13054-020-2770-5.
4. Beaubien-Souligny W, Rola P, Haycock K, et al. Quantifying systemic congestion with Point-Of-Care ultrasound: development of the venous excess ultrasound grading system. *Ultrasound J*. 2020 Apr 9;12(1):16. doi: 10.1186/s13089-020-00163-w.

VExUS grading

Grade 0

No congestion; IVC < 2 cm

Grade 1

Mild congestion
IVC ≥ 2 cm + any
combination of normal or
mildly abnormal waveforms

Grade 2

Moderate congestion
IVC ≥ 2 cm + at least
one severely abnormal
pattern

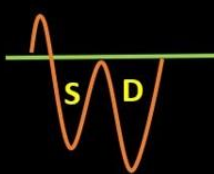
Grade 3

Severe congestion
IVC ≥ 2 cm + two or
more severely
abnormal waveforms

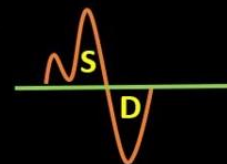
Hepatic vein



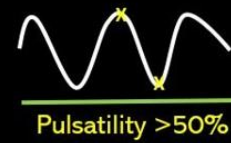
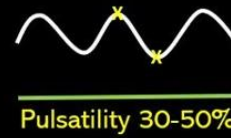
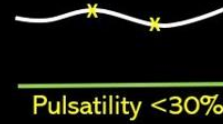
Mildly
abnormal



Severely
abnormal



Portal vein



Intra-renal

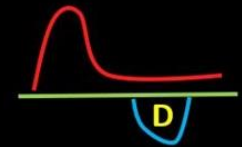
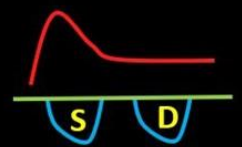
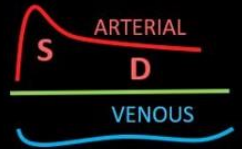


Figure legend

Figure S1: Venous excess ultrasound (VExUS) grading. When the diameter of IVC is more than 2cm, three grades of congestion are defined based on the severity of abnormalities on hepatic, portal, and renal parenchymal venous Doppler. Hepatic vein Doppler is considered mildly abnormal when the S wave is < D wave, but still below the baseline; it is considered severely abnormal when the S wave is reversed. Portal vein Doppler is considered mildly abnormal when the pulsatility is 30-50%, and severely abnormal when it is $\geq 50\%$. Asterisks represent points of pulsatility measurement. Renal parenchymal vein Doppler is mildly abnormal when it is pulsatile with distinct S and D components, and severely abnormal when only D-wave is seen below the baseline.

Figure adapted from NephroPOCUS.com with permission.