



5.2 Guiding the administration of intravenous fluid volume

The purpose of fluid resuscitation in shock is to improve oxygen delivery to vital organs. Briefly, shock may be **hypovolemic** (loss of intravascular volume, with resulting low cardiac preload), **distributive** (pathological reduction in systemic vascular resistance due to vasodilatation), **cardiogenic** (reduction of systolic or diastolic cardiac function), **obstructive** (physical obstruction of the great vessels or the heart, either internally within the vessels themselves or through extrinsic compression). ([63](#),[64](#))

Dengue and plasma leakage

Some patients with dengue experience a clinically significant degree of plasma leakage due to increased vascular permeability, which manifests as fluid accumulation and intravascular fluid depletion, during the critical phase. This typically occurs around day 4–6 of illness and often coinciding with defervescence([65](#)). This phase typically improves spontaneously after 48–72 hours ([66](#)).

Differences in management between arboviruses

Pathophysiological differences between arboviral diseases require adaptation of clinical approaches. For example, plasma leakage in dengue may be profound and require significant initial volumes of intravenous fluid, with subsequent de-escalation to minimise accumulation of interstitial fluid. In contrast, chikungunya can lead to myocarditis and cardiac insufficiency, especially in infants and older adults, making iatrogenic pulmonary oedema more likely; although myocarditis can occur in dengue, this is rare in comparison with the rate of dengue related shock. In each case, monitoring of the effect of intravenous fluid administration should be performed to maximise benefit and minimise harm.

Patient monitoring

Routine patient monitoring for fluid balance includes regular and frequent monitoring of physiological variables, urine output, and laboratory values (notably haematocrit) ([5](#)). Clinical measures of response include blood pressure (including pulse pressure and mean arterial pressure), heart rate, urine output and mental status. Imminent or worsening respiratory compromise, such as pulmonary oedema, may be detected by rising respiratory rate and/or decreasing oxygen saturation.

Fluids should be given to improve targets of perfusion, at volumes and rates which may be modified based on age, weight, clinical and biological conditions (such as acid-base balance) and concomitant therapy. Careful monitoring is essential.