

Conduct of resuscitation

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Resuscitation should not be delayed in order to definitively diagnose the source of the shocked state. However, the timing and nature of resuscitation will depend on the type of shock and the timing and severity of the insult. Rapid clinical examination will provide adequate clues to make an appropriate first determination, even if a source of bleeding or sepsis is not immediately identifiable. If there is initial doubt about the cause of shock, it is safer to assume the cause is hypovolaemia and begin with fluid resuscitation, and then assess the response. Correction of shock is important in the pre- and peri-operative period for all cases of urgent surgery. For example, a patient with bowel obstruction and hypovolaemic shock must be adequately resuscitated before undergoing surgery. If not, the additional surgical injury and hypovolaemia induced during the procedure will increase the physiological demand on the heart, increasing the risk of myocardial infarction; will exacerbate the inflammatory activation and thus the incidence and severity of organ damage (especially acute kidney injury); will increase susceptibility to infection and venous thromboembolism; and will prolong the period of gut dysfunction and overall recovery from surgery. In all cases of shock, regardless of classification, hypovolaemia and inadequate preload must be addressed before other therapy is instituted. Administration of inotropic or chronotropic agents to an empty heart will rapidly and permanently deplete the myocardium of oxygen stores and dramatically reduce diastolic filling and therefore coronary perfusion. Correction of preload by ensuring adequate volume resuscitation should be prioritised before introducing vasopressors or inotropic agents. First-line therapy, therefore, is intravenous access and administration of intravenous fluids. Access should be through short, wide-bore catheters that allow rapid infusion of fluids as necessary. Long, narrow lines, such as central venous catheters, have too high a resistance to allow rapid infusion and are more appropriate for monitoring than fluid replacement therapy. Type of fluids As a general rule, the ideal replacement fluid is one that approximates the fluid lost by the underlying cause of shock. If blood is being lost, the replacement fluid is whole blood or its equivalent in components although crystalloid therapy may be required while awaiting blood products. Other causes of shock will require crystalloid resuscitation with appropriate electrolyte supplementation. In most studies of shock resuscitation there is no overt difference in response or outcome between crystalloid solutions (normal saline, Hartmann's solution, Ringer's lactate) and colloids (albumin or commercially available products). Furthermore, there is less volume benefit to the administration of colloids than had previously been thought, with only 1.3 times more crystalloid than colloid administered in blinded trials. On balance, there is little evidence to support the administration of colloids, which are more expensive and have worse side-effect profiles. Hypotonic solutions (e.g. dextrose) are poor volume expanders and should not be used in the treatment of shock unless the deficit is free water loss (e.g. diabetes insipidus) or patients are sodium overloaded (e.g. cirrhosis).

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