

Reference (include title, author, journal title, year of publication, volume and issue, pages)	Evidence level (I-VII)	Key findings, outcomes or recommendations
Ainsworth S, McGuire W. Percutaneous central venous catheters versus peripheral cannulae for delivery of parenteral nutrition in neonates. Cochrane Database of Systematic Reviews 2015, Issue 10. Art. No.: CD004219. DOI: 10.1002/14651858.CD004219.pub4	I	There is no significant difference between extravasation injuries from peripherally inserted catheters compared to central venous catheters. Both are equally capable of causing injuries.
Al-Benna, S., O'Boyle, C., & Holley, J. (2013). Extravasation injuries in adults. ISRN dermatology, 2013, 856541. doi:10.1155/2013/856541	V	Aetiology and definition of extravasations Frequent assessment of the peripheral site is required, watching for signs of redness or swelling
Beall, V., Hall, B., Mulholland, J. T. and Gephart, S. M. (2013) Neonatal Extravasation: An Overview and Algorithm for Evidence-based Treatment. Newborn and Infant Nursing Reviews, 13(4), pp. 189-195	IV	Neonatal risk factors for extravasation including skin and vein fragility. Extravasation management using hyaluronidase Mechanism of vesicant injuries due to pH, osmolarity and chemical compositions
Casanova D, Bardot J, Magalon G. (2001). Emergency treatment of accidental infusion leakage in the newborn: report of 14 cases. British Journal of Plastic Surgery. 54(5):396-39	VI	Despite there being no consensus on the management of extravasation injuries, high importance is placed on early infiltration to ensure the best results.
Ching, D. L. H., Wong, K. Y. and Milroy, C. (2014) Paediatric extravasation injuries: A review of 69 consecutive patients. International Journal of Surgery, 12(10), pp. 1036-1037.	IV	Early referral to the plastic surgery team was shown to be effective in minimising injury. This study used hyaluronidase (injected within an hour) and saline wash outs as per the Gault method and none of the cases required surgical intervention.
Corbett, M., Marshall, D., Harden, M., Oddie, S., Phillips, R. and McGuire, W. (2019) Treating extravasation injuries in infants and young children: a scoping review and survey of UK NHS practice. BMC Pediatr, 19(1), pp. 6	V	The most common treatments with beneficial results are saline washouts with and without hyaluronidase. This review highlights the importance of having a standardised grading scale for extravasation injuries. The need for randomised controlled trials to determine the most effective method of treatment is highly warranted.

Davies J, Gault D, Buchdahl R. (1994). Preventing the scars of neonatal intensive care. Archives of disease in childhood. 70(1):F50-F5	VI	This study describes the success in using hyaluronidase and saline flush outs to prevent major scarring and plastic surgery involvement in neonatal total parental nutrition extravasation injuries When performed early, these interventions resulted in no soft tissue damage.
Amjad, I., Murphy, T., Nylander-Housholder, L. and Ranft, A. (2011) A New Approach to Management of Intravenous Infiltration in Pediatric Patients: Pathophysiology, Classification, and Treatment. Journal of Infusion Nursing, 34(4), pp. 242-249.	V	Highlights the need for hourly insertion site inspections to ensure no adverse event has occurred. Importance of infiltration or extravasation prevention through taping and securing of the peripheral intravenous catheter. Infusion pump pressures alone shouldn't be used as a method of extravasation detection.
Gault DT. (1993). Extravasation injuries. British Journal of Plastic Surgery. 46(2):91-9	III	Early flush outs (within 24hours of the injury) were shown to avoid complications associated with extravasation injuries Hyaluronidase shown effective in preventing soft tissue necrosis after total parental nutrition extravasation
Gopalakrishnan PN, Goel N, Banerjee S. Saline irrigation for the management of skin extravasation injury in neonates. Cochrane Database of Systematic Reviews 2017, Issue 7. Art. No.: CD008404. DOI: 10.1002/14651858.CD008404.pub3	I	Found no randomised controlled trials comparing the effects of saline irrigation with or without hyaluronidase. Saline irrigation has been frequently documented, in case studies, as a successful intervention in neonates.
Hadaway, L. C. (2010) Preventing Extravasation. Oncology Times, 32(8), pp. 5-6	VII	Management and prevention of extravasation injuries with vesicant drugs and solutions.
Lim, E. Y. P., Wong, C. Y. W., Kek, L. K., Suhairi, S. S. B. M. and Yip, W. K. (2018) Improving the Visibility of Intravenous (IV) Site in Pediatric Patients to Reduce IV Site Related Complications – An Evidence-based Utilization Project. Journal of Pediatric Nursing, 41, pp. e39-e45	VI	Infrequent checks of intravenous sites prevents early detection of extravasation/signs of phlebitis/infiltration Intravenous sites should be observed 1-2hourly when continuous infusions are running
Maly, C., Fan, K. L., Rogers, G. F., Mitchell, B., Amling, J., Johnson, K., Welch, L., Oh, A. K. and Chao, J. W. (2018) A Primer on the Acute Management of Intravenous Extravasation Injuries for the Plastic Surgeon. Plastic and reconstructive surgery. Global open, 6(4), pp. e1743 doi:10.1097/GOX.0000000000001743	IV	Paediatric dosing on 15units of hyaluronidase has been shown effective in resolving extravasation injuries when done within 3 hours of the injury. appropriate immediate management of extravasation injuries may reduce further damage and limb loss
Murphy, A., Gilmour, R. and Coombs, C. (2017) Extravasation injury in a paediatric population: Extravasation injury. ANZ Journal of Surgery, 89	VI	Early recognition and prompt treatment reduces injury related morbidity

Odom, B., Lowe, L. and Yates, C. (2018) Peripheral Infiltration and Extravasation Injury Methodology: A Retrospective Study. <i>Journal of Infusion Nursing</i> , 41(4), pp. 247-252	VI	Paediatric and neonatal risk factors for extravasations. Severe injuries occur after insult to the insertion site. Signs of classifying 'severe' extravasation injuries
Park, H. J., Kim, K. H., Lee, H. J., Jeong, E. C., Kim, K. W., & Suh, D. I. (2015). Compartment syndrome due to extravasation of peripheral parenteral nutrition: extravasation injury of parenteral nutrition. <i>Korean journal of pediatrics</i> , 58(11), 454–458. doi:10.3345/kjp.2015.58.11.454	VI	The risk of extravasation is higher when TPN is administered via a peripheral intravenous catheter compared to a central venous catheter. Insertion sites should be monitored closely for signs of extravasation Pressurised infusion pumps do not always alert staff of extravasation injuries in progress resulting in greater risks of injuries going unnoticed for longer periods of time.
Paquette, V., McGloin, R., Northway, T., Dezorzi, P., Singh, A., & Carr, R. (2011). Describing Intravenous Extravasation in Children (DIVE Study). <i>The Canadian journal of hospital pharmacy</i> , 64(5), 340–345. doi:10.4212/cjhp.v64i5.1069	IV	Risk factors and causes of extravasation injuries in paediatric and neonatal populations Hourly checks of the site, cannula securement and monitoring infusion pump pressures are key to preventing extravasation injuries. Peripheral intravenous catheters have a higher incidence of extravasation compared to central venous catheters.
Phelps SJ, Tolley EA, Cochran EB. (1990). Inability of inline pressure monitoring to predict or detect infiltration of peripheral intravenous catheters in infants. <i>Clinical Pharmacy</i> . 9(4):286-29	VI	There was no significant difference in intravenous pressures between peripheral intravenous catheters in infants that infiltrated compared to those that did not. Monitoring of intravenous pressures alone is not useful in predicting or detecting infiltration of peripheral intravenous catheters.