



Plan for Success: Reducing Vascular Access Device Injuries

Patient Story

Dylan, a 3-week-old boy, presented to the Emergency Department at 11 pm with a fever, runny nose, irritability and poor feeding. His heart rate was 178, temperature was 38.9°C and O₂ saturations 91% in room air. He was breathing fast, was mottled and had a full fontanelle. He was given oxygen via face mask and the sepsis pathway was initiated.

A Resident Medical Officer and Registrar had four unsuccessful attempts at IV cannulation before a Senior Medical Officer inserted a peripheral IV cannula (PIVC) into his left hand. A fluid bolus and IV Cefotaxime, Ampicillin and Aciclovir were given via the cannula. The site was secured and covered with a bandage. Dylan fell asleep in his mother's arms. The IV line was not checked for several hours as there was a reluctance to unsettle Dylan.

After arrival in the ward, Dylan awoke screaming. The bandage was removed and Dylan's left hand and wrist were swollen, red and tender. A red, ulcerated lesion was noted on the dorsum of his hand. A new cannula was inserted. Dylan was referred to the surgical/burns team and required several procedures to address reduced flexion of his wrist.



Infiltration⁽¹⁾: inadvertent administration of non-vesicant solutions from an IV into surrounding tissues.

Extravasation⁽¹⁾: inadvertent administration of vesicant and irritant solutions from an IV into the surrounding tissues.

In the 22 incidents where infiltration/extravasation injuries occurred, contributing factors included:

- Insertion (23%) - position of device, type of device, multiple attempts required;
- Inadequate securement (41%) - reduced visibility of site due to tape/bandages;
- Medications used (36%); and
- Frequency/adequacy/documentation of IV site checks (59%).

Lessons learnt

1 Early escalation of children with Difficult IV Access (DIVA).
Always assess patients prior to attempting PIVC insertion. If a child is identified as DIVA (age <18 months; limited visible/palpable peripheral veins; needle phobia; or previous high-risk cannulation) early escalation to an experienced clinician should occur. Ask the family about the child's IV access history.

2 Hourly IV site checks during continuous infusions should ALWAYS be done (even if it means disturbing the child). Always use "Touch, Look and Compare" procedures. Document site checks and include in all clinical handovers.

3 PIVC dressing and securement should allow easy inspection of site. Secure by a transparent, semi-permeable dressing, with a strong border, so insertion site is visible, and the cannula is immobilised. Items that obscure the site should be removed during checks.



4 Extravasation and infiltration injuries are NOT inevitable. Injuries should be reported, reviewed and processes implemented to prevent recurrence.

5 Identify and treat extravasation injuries early. ⁽¹⁾ If suspected:

- cease and disconnect infusion fluids/injections;
- aspirate residual solution from IV device;
- seek medical advice prior to device removal;
- elevate affected limb; and
- escalate to treating medical, surgical or burns team.

QPQC Review

The QPQC reviewed all serious paediatric clinical incidents involving complications from vascular access devices in Queensland from 2017 to 2019 (n=43). This included 3 incidents of permanent harm (SAC 1) and 40 incidents of temporary harm (SAC 2).

Key findings included: *

67% reported in infants (< 12 months old)

65% involved PIVCs

51% resulted in infiltration/extravasation injuries

*Findings are based on reported clinical incidents only and may not reflect full range of incidents that occurred.

Useful Links

Queensland Health Internal Resources

1. [Infiltration and Extravasation: Prevention/Recognition, Management and Treatment.](#)
2. [Venous Access Device: Insertion & Management of Peripheral & Central Venous Access Devices.](#)
3. [Peripheral Intravenous Cannula \(PIVC\) Insertion.](#)

Other resources

4. Ulman, A.J., Bernstein, S.J., Brown, E., et al. [The Michigan Appropriateness Guide for Intravenous Catheters in Paediatrics: miniMagic.](#) Paediatrics, June 2020, 145 (Supplement 3) S269-S284, DOI: 10.1542/peds.2019-34741
5. [miniMagic App](#) (available on Google Play, App Store and App Factory)
6. Clark, E; Giambra, B; Hingl, J; et al. [Reducing Risk of Harm from Extravasation.](#) Journal of Infusion Nursing: Jan/Feb 2013, Vol 36, Issue 1, p 37-45 doi: 10.1097/NAN.0b013e3182798844