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Audit of peripheral intravenous cannulation practises in paediatric patients at a pheripheral hospital srilanka : indications, documentations and unit based variability

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Abstract

Background: Peripheral intravenous cannulation (PIVC) is common in paediatric care but may cause pain and complications when inappropriate or poorly documented. This audit evaluated PIVC indications, aseptic technique, documentation, monitoring, and removal timing in paediatric ward and emergency unit settings at Base Hospital Dehiaththakandiya.

Methods: Prospective clinical audit over 4 weeks (1 May–1 June 2026). Included paediatric patients aged 0–14 years with peripheral cannulas inserted during the period (n=42). Data were abstracted from patient records, nursing charts, medication charts, procedure notes, and ward observation charts using a standardized proforma. Outcomes were assessed against predefined standards: Indication documented (100%), Aseptic technique documented (100%), Cannula site/date/time recorded (100%), Regular site monitoring documented (≥90%), Cannula removed promptly (100%).

Results: Of 42 cannulations, 33 (78.6%) occurred in Ward 1 and 9 (21.4%) in the ETU. Age ranged 6 months–13 years (mean 4 years 7 months); 23 (54.8%) were male. Indications: therapy requiring IV access (20/42, 47.6%), dehydration (11/42, 26.2%), inappropriate (6/42, 14.3%), emergency treatment (5/42, 11.9%). Compliance: Indication documented 23/42 (54.8%), Aseptic technique documented 17/42 (40.5%), Cannula site/date/time recorded 33/42 (78.6%), Regular site monitoring documented 20/42 (47.6%), Cannula removed promptly 42/42 (100%). No immediate complications observed. Ward vs ETU showed unit-specific differences; ETU higher in aseptic technique documentation, Ward 1 higher in site/date/time documentation.

Conclusion: The audit identifies opportunities to improve patient safety and care quality through standardized documentation, explicit justification of cannulation indications, reinforced aseptic technique, and regular site monitoring. The absence of observed immediate complications should be interpreted in light of the short audit window and documentation gaps. A re-audit is recommended within 3–6 months after targeted improvements.

Keywords: Peripheral intravenous cannulation; paediatric; documentation; aseptic technique; audit; quality improvement; ward vs. emergency unit

Introduction

Rationale: PIVC is a frequently performed procedure in paediatric care but carries risks (pain, infection, infiltration) when used inappropriately or without robust documentation.

Objective: Assess whether cannulation in paediatric patients at a peripheral hospital is performed for appropriate indications, using aseptic technique, with proper documentation and monitoring, and removal when no longer required.

Methods

Design and setting: Prospective clinical audit in the paediatric ward and emergency unit at Base Hospital Dehiaththakandiya.

Population and sampling: All paediatric patients (0–14 years) with peripheral cannulas inserted during 1 May 2026–1 June 2026 (n=42). Data collection: Standard proforma capturing demographics, ward/unit, clinical indication, indication documentation, cannula size/site, date/time of insertion, aseptic technique documentation, site monitoring, complications, date/time and reason for removal, and overall compliance.

Standards:

- Indication documented: 100%
- Aseptic technique documented: 100%
- Cannula site/date/time recorded: 100%
- Regular site monitoring documented: ≥90%
- Cannula removed promptly: 100%
- Analysis: Descriptive statistics (frequencies, percentages). Ward-level subgroup analyses (Ward 1 vs ETU).

Results

Demographics: N=42; Ward 1: 33 (78.6%), ETU: 9 (21.4%); Age mean 4 years 7 months (range 6 months–13 years); sex: male 23 (54.8%), female 19 (45.2%).

Indications: Therapy IV access 20 (47.6%), dehydration 11 (26.2%), inappropriate 6 (14.3%), emergency 5 (11.9%).

Compliance (overall): Indication 23/42 (54.8%), Aseptic technique 17/42 (40.5%), Cannula site/date/time 33/42 (78.6%), Regular site monitoring 20/42 (47.6%), Cannula removed promptly 42/42 (100%).

Complications: 0% immediate complications observed.

Ward vs ETU: Ward 1 higher site/date/time documentation (84.8%) vs ETU (55.6%), ETU higher aseptic technique documentation (55.6%

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vs 36.4%). Indication documentation: Ward 1 60.6% vs ETU 33.3%. Documentation completeness per patient: 0/4 in 1 patient (2.4%); 1/4 in 9 (21.4%); 2/4 in 15 (35.7%); 3/4 in 14 (33.3%); 4/4 in 3 (7.1%).

Table 1: *Demographic Characteristics of the Study Population.*

Demographic Characteristic	Frequency (n)	Percentage (%) / Value
Total Sample Size (N)	42	100%
Age		
Average (Mean) Age	-	4 years, 7 months
Age Range	-	6 months – 13 years
Sex		
Male	23	54.8%
Female	19	45.2%
Ward / Unit		
Ward 1 (Pediatric Ward)	33	78.6%
ETU (Emergency Treatment Unit)	9	21.4%

Table 2: *Clinical Indications for Cannulation..*

Clinical Indication	Frequency (n)	Percentage (%)
Therapy requiring IV access	20	47.6%
Dehydration requiring IV fluids	11	26.2%
Inappropriate (No valid clinical need)	6	14.3%
Emergency treatment	5	11.9%
Total	42	100%

Table 3: *Audit compliance results.*

Audit Criterion	Target Standard	Compliant (n)	Missing / Non-Compliant (n)	Observed Compliance (%)
Indication Documented	100%	23	19	54.8%
Aseptic Technique Documented	100%	17	25	40.5%
Cannula Site, Date & Time Recorded	100%	33	9	78.6%
Regular Site Monitoring Documented	90%	20	22	47.6%
Cannula Removed Promptly	100%	42	0	100.0%

Table 4: *Clinical Indications by Ward vs. ETU*

Clinical Indication	Ward 1 (Paediatric Ward)	ETU (Emergency Unit)
Total Insertions	33	9
Therapy requiring IV access	17 (51.5%)	3 (33.3%)
Dehydration requiring IV fluids	11 (33.3%)	0 (0.0%)
Emergency treatment	3 (9.1%)	2 (22.2%)
Inappropriate (No valid need)	2 (6.1%)	4 (44.4%)

Table 5: *Clinical Indications by Ward vs. ETU*

Audit Criterion	Ward 1 Compliance	ETU Compliance
Aseptic Technique Documented	36.4% (12/33)	55.6% (5/9)
Regular Site Monitoring Documented	51.5% (17/33)	33.3% (3/9)
Indication Documented	60.6% (20/33)	33.3% (3/9)
Cannula Site, Date & Time Recorded	84.8% (28/33)	55.6% (5/9)
Cannula Removed Promptly	100.0% (33/33)	100.0% (9/9)

Table 6: *Pain Relief Administration by Age Group.*

Age Group	Total Patients (n)	Pain Relief Administered (n)	Pain Relief Rate (%)
Infant (< 1 year)	7	4	57.1%
Toddler (1 – 3 years)	10	4	40.0%
Child (> 3 years)	25	7	28.0%

Table 7: *Overall Documentation Completeness per Patient.*

Number of Documents Completed (Out of 4)	Number of Patients (n)	Percentage of Total Sample (%)
0 out of 4 (Completely Undocumented)	1	2.4%
1 out of 4	9	21.4%
2 out of 4	15	35.7%
3 out of 4	14	33.3%
4 out of 4 (Perfect Documentation)	3	7.1%

Table 8: *Pain Relief Administration by Clinical Indication.*

Clinical Indication	Total Patients (n)	Received Pain Relief (n)	Pain Relief Rate (%)
Dehydration requiring IV fluids	11	7	63.6%
Emergency treatment	5	2	40.0%
Therapy requiring IV access	20	5	25.0%
Inappropriate	6	1	16.7%

Figure 1: *Distribution of ward/unit and indications.*

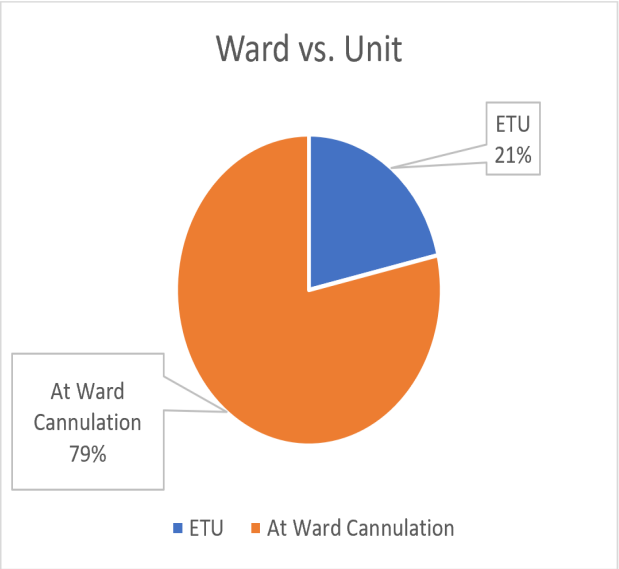
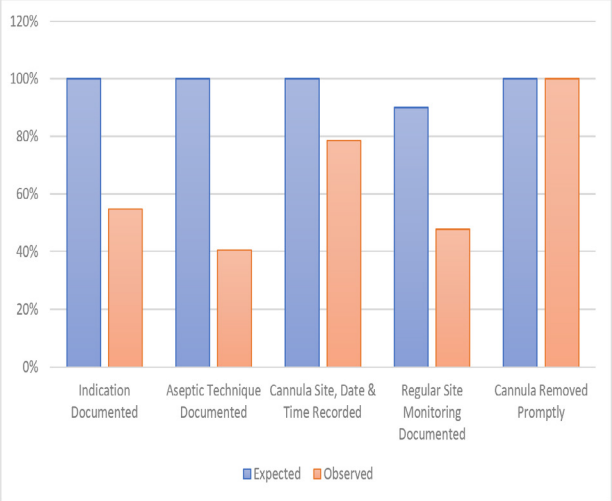


Figure 2: *Compliance by standard (Indication, Aseptic technique, Site/Date/Time, Monitoring, Removal).*



Discussion

Strengths: Clear audit framework; unit-level analyses highlighting actionable gaps; no immediate complications observed in the short window.

Limitations: Short observation window; reliance on documentation may underrepresent actual practice; sample size limits generalizability.

Implications: Documentation improvement, explicit indication criteria, reinforcement of aseptic technique, and standardized monitoring to reduce unnecessary cannulations and potential pain/infection.

Limitations

Audit window limited to 4 weeks; longer-term complications may not have been captured.

Documentation quality may not perfectly reflect clinical practice; observer bias possible.

Conclusion

The audit demonstrates substantial opportunities to improve patient safety through standardized documentation, explicit justifications for cannulation indications, robust aseptic technique, and regular monitoring. Unit-level differences require tailored interventions and ongoing monitoring.

Recommendations

- Implement a standardized cannulation documentation checklist integrated into the medical record/electronic system.
- Develop concise indications guidelines and require sign-off for non-emergent cannulations.
- Mandate ANTT refreshers and periodic competency assessments.
- Establish a standardized site-monitoring schedule with prompts.
- Create ward-specific improvement plans and appoint ward champions.
- Conduct a re-audit at 3–6 months post-intervention.