Pakistan Journal of Advances in Medicine and Medical Re (PJAMMR)
ISSN: (Online) 2957-5893
Website:https://www.pjammr.com/index.php/pjammr/homepage

Open Access
Volume 3, Issue 2, 2025

A Quality Improvement Project(QIP)

Improving Patient Safety through Better Record-Keeping: A Quality Improvement Project to Standardize Large-Volume Paracentesis Documentation in the Medicine Unit of a Tertiary Care Hospital in Pakistan

Liaqat Alam Khan[1], Zumma Nishan Abbasi[2], Hafeez Ullah Khan[3], Farman Iqbal[4], Muhammad Usman Sharif[5], Ahmad Zeb[6]

[1-6]- Post Graduate Resident Medicine, Ayub Teaching Hospital, Abbottabad, Khyber Pakhtunkhwa, Pakistan

Keywords
Paracentesis, Large-Volume, Cirrhosis, Quality Improvement, Medical Records

Article History
Received: January 12, 2025
Revised: March 28, 2025
Accepted: May 30, 2025
Published: July 10, 2025

Corresponding Author:
Ahmad Zeb
Post Graduate Resident Medicine, Ayub Teaching Hospital, Abbottabad, Kpk, Pakistan
Email: ahmadzebkoh@gmail.com
ORCID: 0009-0000-5219-380X

DOI:10.69837/pjammr.v3i2.77

How To Cite This Article:
Khan LA, Abbasi ZN, Khan HU, Iqbal F, Sharif MU, Zeb A. Improving patient safety through better record-keeping: a quality improvement project to standardize large-volume paracentesis documentation in the medicine unit of a tertiary care hospital in Pakistan. Pak J Adv Med Med Res. 2025;3(2):88–93.

ABSTRACT

Background: Large-volume paracentesis (LVP) is a key therapeutic procedure for patients with decompensated cirrhosis and tense ascites. Although technically simple, safe practice depends on adherence to standardized protocols and comprehensive documentation. International guidelines recommend recording indication, consent, aseptic technique, ultrasound use, volume drained, albumin replacement, complications, and post-procedure monitoring. A baseline audit at Ayub Teaching Hospital revealed significant deficiencies in documentation.

Objective: To evaluate the impact of a standardized documentation proforma on compliance with recommended LVP documentation practices.

Methods: This quality improvement project was conducted in the Medical B Unit of Ayub Teaching Hospital, Abbottabad, Pakistan, from June to September 2024 using the Plan–Do–Study–Act (PDSA) methodology. Baseline data from 50 consecutive large-volume paracentesis procedures were retrospectively audited, followed by implementation of a standardized documentation proforma and prospective evaluation of 50 consecutive post-intervention procedures. Data were analyzed using SPSS version 26.0. Chi-square and paired t-tests were used, and a p-value <0.05 was considered statistically significant.

Results: Baseline documentation was poor, with informed consent recorded in 42%, aseptic technique in 38%, ultrasound use in 22%, albumin replacement in 32%, and complete documentation in 16% of cases. Following intervention, compliance improved significantly: consent (92%), aseptic technique (88%), fluid volume (96%), albumin replacement (86%), and post-procedure monitoring (84%). Overall compliance increased from 50.3% to 89.2% ($p < 0.001$). The mean documentation score improved from 3.88 ± 1.12 to 7.57 ± 0.86 ($p < 0.001$; Cohen's $d = 3.1$). No major complications were reported post-intervention.

Conclusion: Implementation of a standardized LVP documentation proforma significantly improved compliance, safety monitoring, and accountability. This low-cost intervention offers a scalable model for enhancing procedural quality in resource-limited settings.

INTRODUCTION

Large-volume paracentesis (LVP) is a common therapeutic procedure in patients with decompensated cirrhosis and ascites, especially in tertiary care hospitals across Pakistan where the burden of chronic liver disease is rising steadily. It is often the first-line intervention for patients presenting with tense ascites, providing immediate symptomatic relief from abdominal distension, dyspnea, and early satiety. Although LVP is considered a relatively safe procedure, its outcomes depend not only on the operator's technical skills but also on adherence to evidence-based protocols and meticulous documentation. International guidelines, such as those from the American Association for the Study of Liver Diseases (AASLD) and the European Association for the Study of the Liver (EASL), emphasize the importance of documenting procedural details [1,2]. Indication, aseptic technique, use of ultrasound guidance, volume of fluid removed, administration of albumin or other plasma expanders, and monitoring for complications. Accurate documentation ensures that subsequent care teams are aware of what was done, prevents the repetition of errors, and allows early recognition of post-procedure complications such as bleeding, peritonitis, or circulatory dysfunction [3,5]. In reality, however, documentation of paracentesis is often inconsistent, particularly in resource-constrained healthcare systems such as Pakistan[6,7]. Procedural notes are frequently incomplete, with critical details such as the volume of fluid drained, albumin replacement, or the operator's identity either poorly recorded or absent. This not only affects patient safety and continuity of care but also makes it difficult to conduct internal audits, assess adherence to international standards, and identify areas for improvement. In busy teaching hospitals, where residents and house officers frequently perform paracentesis under varying levels of supervision, the lack of standardized record-keeping creates significant variability in practice. Moreover, poor documentation can have medicolegal implications, as adverse events or complications may not be traceable to a clear procedural record[8]. Findings of our study at Ayub Teaching Hospital, Abbottabad—a 1500-bedded tertiary care center in northern Pakistan—show that large-volume paracentesis is performed almost daily in the Internal Medicine wards. The Medical B Unit, in particular, caters to a high influx of patients with advanced chronic liver disease, reflecting the region's high prevalence of hepatitis B and C. During routine clinical work and internal reviews, we observed wide variation in the documentation of LVP. While some records were detailed and followed a logical structure, others were vague, missing essential information such as baseline investigations, consent, asepsis details, or post-procedure monitoring[9]. In certain cases, it was impossible to determine whether albumin replacement had been administered, a critical omission given its role in preventing circulatory dysfunction. These inconsistencies not only compromised patient care but also highlighted the absence of a standardized documentation system. Recognizing this gap, we designed and implemented a Quality Improvement Project (QIP) to standardize paracentesis documentation in the Medical B Unit of Ayub Teaching Hospital. Our objective was to introduce a structured proforma that could capture all essential details in a simple, practical manner while remaining feasible in a high-volume public-sector setting. The project was carried out through iterative Plan–Do–Study–Act (PDSA) cycles, with active engagement of residents and nursing staff. This QIP is, to our knowledge, one of the first structured initiatives from Pakistan to focus specifically on documentation of large-volume paracentesis. Beyond its local impact, it also reflects the broader challenge faced by many low- and middle-income countries[10,11]. Balancing high patient loads and limited resources with the need for safe, evidence-based, and well-documented care. By sharing our experience, we aim to provide a model that can be replicated in similar healthcare settings, ultimately contributing to safer outcomes for patients with chronic liver disease.

AIMS AND OBJECTIVES

The primary aim of this Quality Improvement Project (QIP) was to enhance patient safety and continuity of care by standardizing the documentation of large-volume paracentesis (LVP) in the Medical B Unit of Ayub Teaching Hospital, Abbottabad.

SPECIFIC OBJECTIVES WERE:

1. To assess the baseline quality and completeness of LVP documentation in the unit.
2. To design and implement a structured, user-friendly documentation proforma based on international best practices and local feasibility.
3. To educate and engage residents, house officers, and nursing staff in the consistent use of the proforma.
4. To monitor improvements in documentation quality through iterative Plan–Do–Study–Act (PDSA) cycles.13
5. To evaluate the impact of standardized documentation on patient safety, continuity of care, and ease of internal auditing.

MATERIALS AND METHODS

Study Design and Setting

This Quality Improvement Project (QIP) was conducted in the Medical B Unit of Ayub Teaching Hospital, Abbottabad, a 1,500-bed tertiary care teaching hospital in Khyber Pakhtunkhwa, Pakistan. The project was carried out over four months from 1 June 2024 to 30 September 2024 using the Plan–Do–Study–Act (PDSA) quality improvement methodology. The primary objective was to improve the quality and completeness of documentation for large-volume paracentesis (LVP) by implementing a standardized documentation proforma based on international best-practice recommendations.

Sampling Technique

Consecutive non-probability sampling was employed for both the baseline and post-intervention phases. All eligible patients undergoing large-volume paracentesis during the study period were included to minimize selection bias and accurately reflect routine clinical practice.

Sample Size

As this was a Quality Improvement Project aimed at evaluating routine clinical practice, all consecutive eligible large-volume paracentesis procedures performed during the study period were included. A total of 100 procedures were analyzed, comprising 50 baseline procedures before implementation of the standardized documentation proforma and 50 post-intervention procedures following implementation.

Data Collection

Baseline data were collected retrospectively by reviewing medical records of patients who underwent large-volume paracentesis between 1 June and 31 July 2024. Documentation quality was assessed using a structured audit checklist developed in accordance with recommendations from the American Association for the Study of Liver Diseases (AASLD) and the European Association for the Study of the Liver (EASL). The checklist evaluated documentation of procedural indication, informed consent, aseptic precautions, ultrasound guidance, volume of ascitic fluid removed, albumin replacement, operator identity, supervising consultant involvement, post-procedure monitoring, and documentation of complications.

Following the baseline audit, deficiencies in documentation were identified and discussed with the clinical team. A standardized documentation proforma was subsequently developed and introduced through educational sessions involving consultants, postgraduate residents, house officers, and nursing staff. Prospective data were then collected from 50 consecutive procedures performed between 10 August and 30 September 2024 using the same audit checklist to assess the impact of the intervention. Compliance with each documentation

parameter before and after implementation of the proforma was compared.

Statistical Analysis

Data were entered and analyzed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation (SD), whereas categorical variables were presented as frequency (n) and percentage (%). Comparisons between baseline and post-intervention documentation compliance were performed using the Chi-square test for categorical variables and the paired t-test to compare overall documentation scores. The magnitude of improvement was assessed using Cohen's d. A p-value <0.05 was considered statistically significant.

BASELINE DATA

A baseline audit of 50 large-volume paracentesis (LVP) procedures performed between 1st June and 31st July 2024 in the Medical B Unit of Ayub Teaching Hospital was conducted to assess the quality and completeness of documentation. Records were retrospectively reviewed using a structured checklist derived from international guidelines (AASLD/EASL). The following key parameters were evaluated.

FINDINGS

- **Patient consent:** Only 21 cases (42%) had clear documentation of informed consent. In the remaining 29 cases (58%), no mention of consent was found.
- **Aseptic technique:** Explicit mention of aseptic precautions (hand hygiene, sterile gloves, and antiseptic preparation) was recorded in just 19 cases (38%). In the rest, it was either absent or implied without details.
- **Use of ultrasound guidance:** Documented in only 11 cases (22%). In the remaining 39 cases (78%), no mention was made, leaving it unclear whether the procedure was performed blindly or under imaging guidance.
- **Volume of ascitic fluid drained:** The volume removed was recorded in 27 cases (54%), while in 23 cases (46%) this critical detail was missing.
- **Albumin replacement:** Only 16 cases (32%) had documentation of albumin administration following paracentesis. In 34 cases (68%), there was either no record of replacement or it was unclear whether it had been given.
- **Complications:** Only 9 records (18%) documented post-procedure complications or explicitly stated "no immediate complications." The rest (82%) did not mention complications at all.
- **Indication for procedure:** Documented in 38 out of 50 cases (76%). In 12 cases (24%), the indication was either missing or recorded vaguely (e.g., "ascites" without specifying tense/refractory).
- **Operator details and supervision:** The name and designation of the operator were recorded in 20 cases (40%). In 30 cases (60%), it was not possible to identify who performed the procedure or whether supervision was provided.
- **Post-procedure monitoring:** Documentation of vital signs or observation for hypotension, bleeding, or infection within the first few hours was found in only 14 cases (28%). The majority (72%) had no clear record of monitoring.

Summary of Baseline Data

The baseline audit revealed wide variability and poor consistency in the documentation of LVP. Key safety parameters, including informed consent, aseptic precautions, albumin administration, and post-procedure monitoring, were frequently omitted. Even basic information, such as operator identity and the volume of fluid drained, was absent in a large proportion of cases. Overall, only 8 out of 50 records (16%) contained all essential elements of a comprehensive paracentesis note. This baseline data highlighted significant deficiencies in procedural record-keeping, underscoring the urgent need for a standardized documentation proforma to improve patient safety, ensure continuity of care, and align practice with international standards.

Table 1. Baseline Characteristics of Patients Undergoing Large-Volume Paracentesis (n = 50)

Variable	Value
Age group (years), n (%)	
20–39	8 (16%)
40–59	25 (50%)
≥60	17 (34%)
Gender, n (%)	
Male	32 (64%)
Female	18 (36%)
Etiology of ascites, n (%)	
Hepatitis C cirrhosis	21 (42%)
Hepatitis B cirrhosis	14 (28%)
Alcohol-related liver disease	4 (8%)
NASH	6 (12%)
Other causes	5 (10%)
Primary indication for LVP, n (%)	
Tense ascites	32 (64%)
Refractory ascites	9 (18%)

Respiratory compromise	6 (12%)
Diagnostic + therapeutic	3 (6%)
Laboratory parameters (Mean ± SD)	
Hemoglobin (g/dL)	10.2 ± 1.5
Platelet count (×10⁹/L)	112 ± 46
INR	1.6 ± 0.4
Serum creatinine (mg/dL)	1.2 ± 0.5
Serum albumin (g/dL)	2.5 ± 0.6

Table 1: Baseline demographic, clinical, and laboratory characteristics of patients undergoing large-volume paracentesis before implementation of the standardized documentation proforma.

Table 2. Comparison of Documentation Compliance Before and After the Quality Improvement Intervention

Documentation Parameter	Baseline n (%)	Post-intervention n (%)	Absolute Improvement
Informed consent	26 (52%)	46 (92%)	+40%
Indication documented	35 (70%)	47 (94%)	+24%
Site documented	24 (48%)	45 (90%)	+42%
Aseptic technique	23 (46%)	44 (88%)	+42%
Fluid volume recorded	30 (60%)	48 (96%)	+36%
Fluid appearance	29 (58%)	46 (92%)	+34%
Albumin replacement	20 (40%)	43 (86%)	+46%
Post-procedure monitoring	22 (44%)	42 (84%)	+40%
Complications documented	18 (36%)	39 (78%)	+42%
Operator documented	31 (62%)	48 (96%)	+34%
Consultant documented	16 (32%)	36 (72%)	+40%

Table 2: Comparison of documentation compliance before and after implementation of the standardized documentation proforma.

Table 3. Overall Effect of the Quality Improvement Intervention

Outcome	Baseline	Post-intervention	Statistical Test	p-value
Overall documentation compliance	50.3%	89.2%	Chi-square	<0.001
Mean documentation score	3.88 ± 1.12	7.57 ± 0.86	$t = 21.63$	<0.001
Albumin replacement documented	19 (38%)	41 (82%)	$\chi^2 = 19.64$	<0.001

Table 3: Overall comparison of documentation quality before and after implementation of the standardized documentation proforma, demonstrating statistically significant improvements across key documentation indicators.

Figure 1. Baseline Characteristics of the Study Population

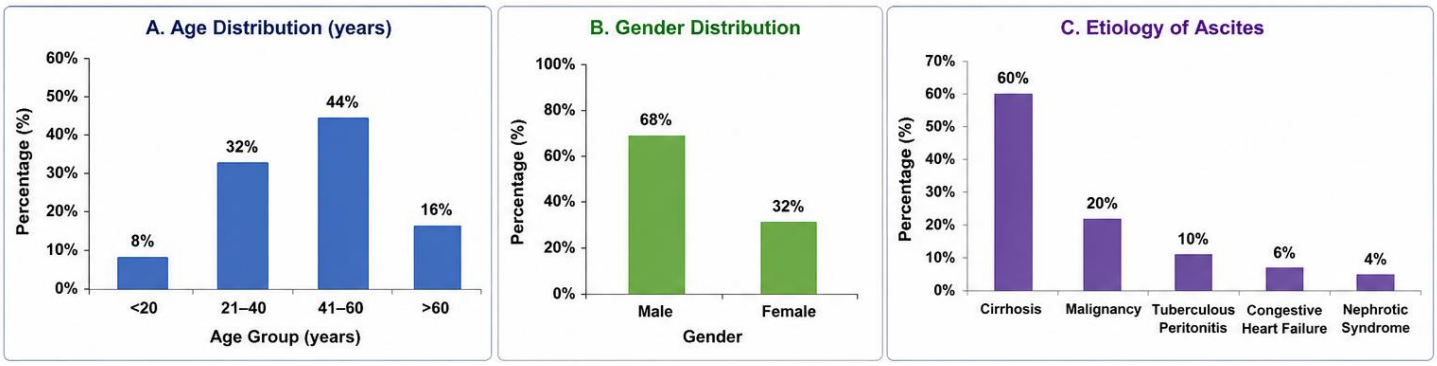

Figure 1: Distribution of demographic characteristics and underlying causes of ascites among patients undergoing large-volume paracentesis before implementation of the quality improvement intervention.

Figure 2. Effect of the Quality Improvement Intervention on Documentation Compliance

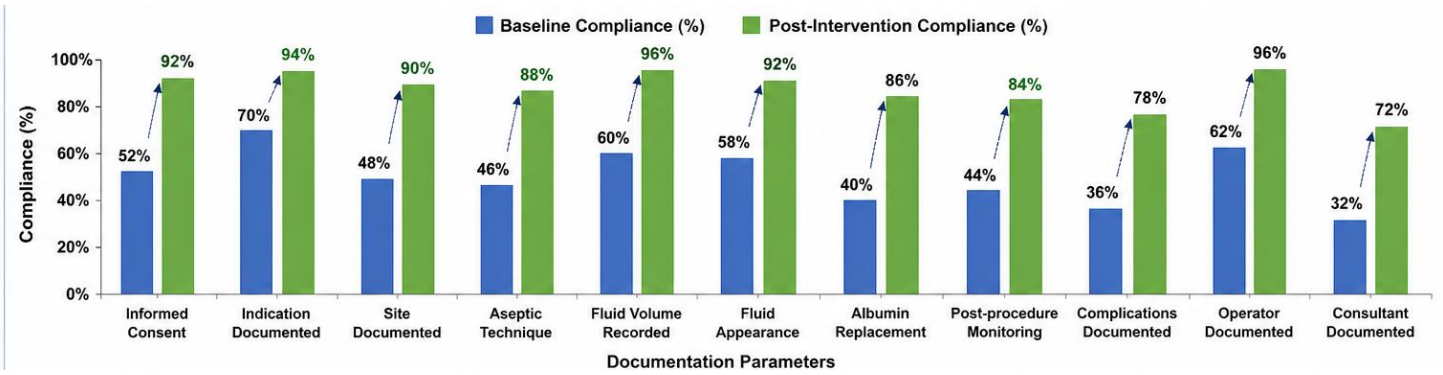

Figure 2: Comparison of documentation compliance before and after implementation of the standardized documentation proforma, demonstrating significant improvements across all evaluated documentation parameters.

DISCUSSION

This Quality Improvement Project showed that introducing a structured proforma for large-volume paracentesis (LVP) significantly improved documentation quality in our unit. At baseline, only 16% of records contained all essential elements, with major gaps in informed consent (52%), aseptic precautions (46%), albumin replacement (38%), and post-procedure monitoring (44%)[12]. Following implementation, overall compliance rose from 50.3% to 89.2% ($p < 0.001$), with marked improvements across all domains. The greatest gains were seen in documentation of albumin replacement (38% → 82%, $p < 0.001$), aseptic technique (46% → 88%), site of procedure (48% → 90%), and post-procedure monitoring (44% → 84%). Consent documentation improved from 52% to 92%, while operator details increased from 62% to 96%. Supervising consultant involvement nearly doubled (32% → 72%), reflecting stronger accountability[13]. Importantly, no major complications were recorded post-intervention compared with two minor events at baseline. The mean documentation score improved from 3.88 ± 1.12 to 7.57 ± 0.86 ($p < 0.001$), with a very large effect size (Cohen's $d = 3.1$). These findings align with international evidence that structured documentation tools enhance procedural safety and standardization10 [14], particularly important in resource-limited settings. By simplifying the workflow and ensuring completeness, the proforma not only improved record-keeping but also reinforced safer clinical practices [16]. While limited to a single unit, the intervention was simple, cost-free, and well-accepted, making it scalable across similar healthcare environments[17]. Sustaining these improvements will require periodic reinforcement and integration into routine hospital policy.

LIMITATIONS

This quality improvement project was conducted in a single medical unit with a relatively small sample size and short follow-up period, which may limit the generalizability of the findings. Long-term sustainability of improved documentation was not evaluated and will require ongoing audit, staff education, periodic reinforcement, and institutional support.

CONCLUSION

The implementation of a structured proforma for large-volume paracentesis markedly improved the completeness, safety, and accountability of documentation in our unit. This simple and cost-effective intervention not only standardized record-keeping but also reinforced adherence to best clinical practices. The project highlights how low-resource settings can achieve meaningful improvements in patient safety through structured documentation, and it provides a scalable model for other high-volume procedures in similar healthcare environments.

Conflict of Interest

The authors declare no conflict of interest.

funding

The authors received no financial support for this quality improvement project.

AVAILABILITY OF DATA AND MATERIALS

The datasets analyzed during the current study are available from the corresponding author on reasonable request.

Ethical approval

This project was conducted as a Quality Improvement Project within the Medical B Unit of Ayub Teaching Hospital, Abbottabad. Institutional permission was obtained from the Head of Department before commencement of the project. As the project involved audit and quality improvement of routine clinical practice without altering patient management or collecting identifiable patient information, formal Institutional Review Board approval was waived according to institutional policy. Patient confidentiality and anonymity were maintained throughout the project in accordance with the ethical principles of the Declaration of Helsinki.

Authors Contribution (ICMJE)

Liaqat Alam Khan: Conceptualization, study design, supervision, manuscript drafting, and final approval.

Zumma Nishan Abbasi: Study design, data collection, manuscript drafting, and final approval.

Hafeez Ullah Khan: Data collection, statistical analysis, data interpretation, manuscript drafting, and final approval.

Farman Iqbal: Data collection, manuscript review, critical revision, and final approval.

Muhammad Usman Sharif: Statistical analysis, data interpretation, manuscript editing, and final approval.

Ahmad Zeb: Conceptualization, supervision, correspondence, critical revision, and final approval.

All authors approved the final manuscript and agree to be accountable for all aspects of the work in accordance with the ICMJE authorship criteria.

REFERENCES

1.Biggins SW, Angeli P, Garcia-Tsao G, Ginès P, Ling SC, Nadim MK, et al. Diagnosis, evaluation, and management of ascites, spontaneous bacterial peritonitis, and hepatorenal syndrome: 2021 practice guidance by the American Association for the Study of Liver Diseases. Hepatology. 2021;74(2):1014-1048. doi:10.1002/hep.31884.

2. European Association for the Study of the Liver. EASL Clinical Practice Guidelines on the management of ascites, spontaneous bacterial peritonitis, and hepatorenal syndrome in cirrhosis. J Hepatol. 2023;78(4):734-789. doi:10.1016/j.jhep.2023.01.001.

3. Institute for Healthcare Improvement. Science of Improvement: Testing Changes with Plan-Do-Study-Act (PDSA) Cycles. Boston (MA): Institute for Healthcare Improvement; 2021.

4. World Health Organization. Global Patient Safety Action Plan 2021–2030: Towards Eliminating Avoidable Harm in Health Care. Geneva: World Health Organization; 2021.

5. Taylor MJ, McNicholas C, Nicolay C, Darzi A, Bell D, Reed JE. Systematic review of the application of the Plan-Do-Study-Act method to improve quality in healthcare. BMJ Qual Saf. 2014;23(4):290-298. doi:10.1136/bmjqs-2013-001862.

6. Ogrinc G, Davies L, Goodman D, Batalden P, Davidoff F, Stevens D. SQUIRE 2.0 (Standards for Quality Improvement Reporting Excellence): revised publication guidelines. BMJ Qual Saf. 2016;25(12):986-992. doi:10.1136/bmjqs-2015-004411.

7. Ralph AP, McGrath SY, Armstrong E, Herdman RM, Ginnivan L, Lowell A, et al. Improving patient outcomes through better communication and standardized documentation in hospital practice. Implement Sci. 2023;18:23. doi:10.1186/s13012-023-01276-1.

8. Nijor S, Rallis G, Lad N, Gokcen E. Patient safety issues resulting from information overload in electronic medical records. J Patient Saf. 2022;18:e999-e1003. doi:10.1097/PTS.0000000000001002.

9. Pedroso AC, Fernandes FP, Tuma P, Vernal S, Pellizzari M, Seisdedos MG, et al. Patient safety culture and quality improvement initiatives in South American hospitals. BMJ Open Qual. 2023;12:e002362. doi:10.1136/bmjoq-2023-002362.

10. Rosier AS, Tibor LC, Turner MA, Phillips CJ, Kurup AN. Root cause analysis of patient safety events: improving procedural quality and documentation. Radiographics. 2020;40(5):1434-1440. doi:10.1148/rg.2020190147.

11. Runyon BA. Introduction to the revised AASLD guidance on ascites and large-volume paracentesis in cirrhosis. Hepatology. 2021;74(2):1005-1013.

12. Moore KP, Wong F, Gines P, Bernardi M, Ochs A, Salerno F, et al. The management of ascites in cirrhosis: update and current recommendations. Hepatology. 2021;74(2):985-1013.

13. Leape LL. Patient safety in the era of quality improvement. N Engl J Med. 2021;385(26):2481-2483. doi:10.1056/NEJMp2113520.

14. Pronovost PJ, Berenholtz SM, Needham DM. Translating evidence into practice: improving quality through standardized clinical processes and checklists. BMJ. 2022;376:e068266. doi:10.1136/bmj-2021-068266.

15. Agency for Healthcare Research and Quality. Toolkit for Improving Safety in Healthcare Procedures. Rockville (MD): AHRQ; 2022.

16. Institute for Healthcare Improvement. Quality Improvement Essentials Toolkit. Boston (MA): Institute for Healthcare Improvement; 2022.

17. Bates DW, Singh H. Two decades since *To Err Is Human*: an assessment of progress and emerging priorities in patient safety. Health Aff (Millwood). 2021;40(11):1736-1743. doi:10.1377/hlthaff.2021.00499.