

# A nursing tool to improve the flow and safety of patients receiving a lumbar puncture

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## Background:

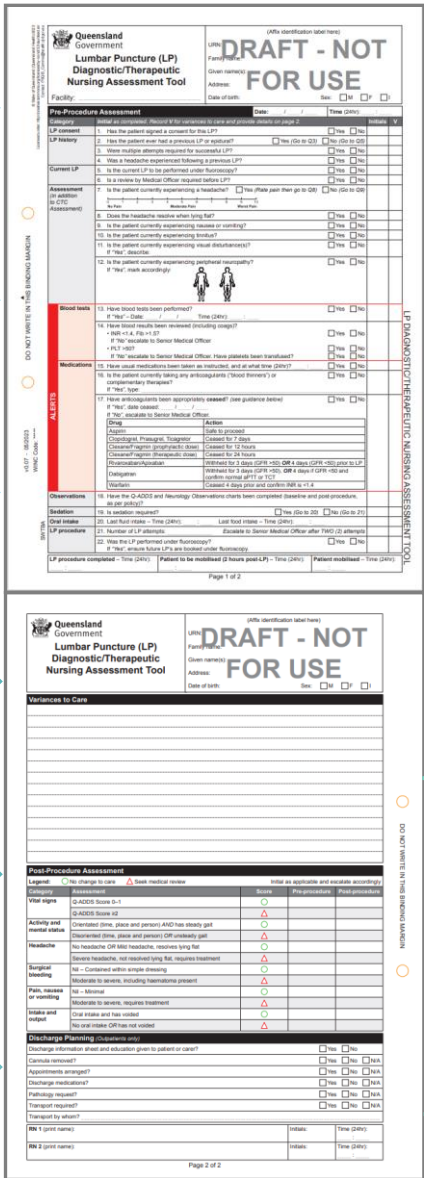
- Lumbar Puncture (LP): A diagnostic and therapeutic procedure used in the treatment of haematological malignancy.
- Despite the benefits, LP-complications can include severe post-dural puncture headache (PDPH), bleeding, pain, neurological changes, and infection<sup>1</sup>.
- In a randomised controlled trial into PDPH and time spent lying flat post-LP, clinicians from the Royal Brisbane and Women’s Hospital (RBWH) developed an LP Nursing Assessment Tool (“the tool”) for data collection<sup>2</sup>.
- The tool was found to support Oncology Day Therapy Unit (ODTU) staff in managing patients receiving an LP.
- However, audit data revealed inconsistent tool completion and > 66% of surveyed nurses reported it as “not at all user-friendly” or “needing improvement”.
- The results highlighted that the tool could be of significant value for the ODTU, but was limited by its design.

## Method:

- The tool was redesigned using an iterative co-design approach. This included consultation cycles and process mapping with nursing, medical, pharmacy, consumers, organisational psychology, and patient safety stakeholders.
- The revised tool was evaluated against validated tools and National Safety and Quality Health Service Standards<sup>3</sup>.
- The tool’s content, language, logic, and flow of information were evaluated against heuristics and usability design principles to assess ease of use and function.

## Results:

-  **Pre-procedure check:**
  - Patient history of LP (to establish if follow-up post-procedure, fluoroscopy, or medical review are required)
-  **Pre-procedure review:**
  - Recent blood pathology
  - Current medications (with focus on antithrombotic therapies)
-  **Procedure check:**
  - Procedure details
  - Prompt to escalate to senior medical officer after two LP attempts
-  **Variance check:**
  - Space to document variances to care or procedure to allow flexibility and provide context.
-  **Post-procedure review:**
  - Scale to show if escalation for a medical review is required.
-  **Discharge plan:**
  - Checklist of actions required before discharge.



## Usability Analysis:

- Clarity**  
Questions are clear and succinct to prevent ambiguity.
- Consistency**  
Information is formatted in the same way to increase efficiency and flow.
- Effort**  
Critical checks are highlighted and rely on recognition (not recall) to reduce workload.
- Order**  
Questions and checks reflect the natural progression of tasks to increase efficiency.
- Flexibility**  
Space is provided to allow for adaptation and change.
- Legibility**  
Information is easily read and presents limited visual noise to reduce workload.
- Value**  
Only relevant information is presented to support users’ tasks.

## Key Points:

- Heuristic evaluation and usability testing of clinical tools can inform more effective and functional support measures.
- Results from a 3-month trial in Outpatient and Inpatient settings across Cancer Care Services, RBWH, will be used to inform further iterative changes for the LP Nursing Assessment Tool’s improvement.

### References:

1. Bezov, D., Ashina, S., & Lipton, R. (2010). Post-dural puncture headache: Part II – Prevention, Management, and Prognosis. *Headache*, 50(9),1482-1498
2. Percival, V.H., Gavin, N.C., Curley C., Leutenegger, J., Partridge G., & Button, E. (2021). Supporting nursing staff to care for people with a haematological malignancy who receive a lumbar puncture via development of an assessment tool. *CNSA Conference (Poster)*. Retrieved from: <https://cnsa2022.paperlessvents.com.au/list/2021>
3. Australian Commission on Safety and Quality in Health Care. (2021). *National Safety and Quality Health Service Standards, 2nd Edition*. [https://www.safetyandquality.gov.au/sites/default/files/2021-05/national\\_safety\\_and\\_quality\\_health\\_service\\_nsqs\\_standards\\_second\\_edition\\_-\\_updated\\_may\\_2021.pdf](https://www.safetyandquality.gov.au/sites/default/files/2021-05/national_safety_and_quality_health_service_nsqs_standards_second_edition_-_updated_may_2021.pdf)