Inpatient Lumbar Puncture Services: Improving Efficiency Through Medical Education

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Background

Lumbar punctures (LPs) are a commonly performed invasive procedure, used in the diagnosis of acute neurological illnesses. They are traditionally performed by the medical team, however infrequent trainee exposure, combined with a growing cohort of technically challenging patients (frailty, obesity), has resulted in an increase in patients booked to the emergency (CEPOD) theatre list for anaesthetic support.

These procedures are often delayed due to higher priority emergency cases, resulting in management delays and prolonged hospital stays. This quality improvement project aimed to evaluate current utilisation of CEPOD for LPs, its impact on patient care and Internal Medicine Trainee (IMT) desire for further LP training.

Methods

CEPOD theatre logs were screened October 2023 to April 2024, with data collected including LP indication, ward attempt history, reason for CEPOD referral, and time between booking and completion. A questionnaire was sent to all Foundation Doctors and IMTs, regarding number of LPs performed in the previous year, confidence performing LPs independently, and if further practical training was desired.

Inclusion and Exclusion Criteria

All adult patients listed for an emergency theatre LP were included. Paediatric and therapeutic or elective LP procedures were excluded.

Initial Results

19 patients were listed for LP on CEPOD: 8 investigated for SAH, 10 for meningitis, 1 for Guillain-Barre Syndrome. 13 had had an LP attempted on the ward: 67% performed by a Medical Registrar or above, average of 2.9 attempts. Reason for CEPOD referral included procedural support (74%) where an anaesthetist performed the LP, and sedation (26%).

The average time from medical plan for LP to completion was 3.3 days. 69% of patients waited 1 day whilst listed for CEPOD.

27 clinicians responded to the questionnaire. 56% had not completed an LP in the previous year, 48% said lack of experience hindered performance, and 56% had listed a patient for LP on CEPOD. 78% said they did not feel comfortable performing LPs independently, and 100% said they would like further training.

Intervention

A practical training session was delivered to 6 IMTs (30% of IMTs). This allowed practical experience using different spinal needle gauges, on a mannequin with varying spinal inserts to simulate obese or elderly patients (Fig. 1). A “top tips” information leaflet for guidance on patient positioning, needle technique and special circumstances such as scoliosis and severe obesity was also provided.

Fig. 1 LP mannequin with spinal inserts

Post-Intervention Results

Theatre logs were screened in May 2024 following the training session, during which no LP cases were listed. Feedback from IMTs who attended training was positive, with 100% stating they found the

training session useful, and they felt confident performing an LP unsupervised.

Limitations and Recommendations

Post-intervention data collection showed an apparent reduction in LP bookings to CEPOD but covered a shorter period than initial data collection. LP procedures completed by the CEPOD anaesthetist on the ward are not documented in theatre logs. Data collected may be an under-representation of anaesthetic time use.

Questionnaires were sent to Foundation Doctors and IMTs. These results do not include Trust Grade Doctors, also involved in ward LP provision.

LP is not designated a core skill for Foundation Doctors therefore we were unable to provide them with a training session.

Minimal IMTs attended the training session. Further training sessions are required before clinical impact can be accurately assessed. IMT teaching sessions are not offered to Trust Grade Doctors. Additional training sessions for all doctors will be offered and CEPOD utilisation reviewed between October and April 25.

Conclusions

Initial data collection showed a potential 43% delay to LP whilst listed on CEPOD. 74% of cases were listed because of technical difficulties, with doctors expressing a desire for training. Following intervention, data collection showed an apparent reduction in the number of LPs listed on CEPOD with an improvement in clinician confidence. If this is maintained and additional IMT's and Trust doctors attend training this will result in a reduction in time to LP results, definitive management, and discharge with an associated positive impact on patient care, wellbeing, and resource management.