

00341 Comparison of Pleural Pressure Measuring Instruments

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Purpose: To compare the accuracy of a handheld digital manometer with an electronic transducer manometer and U-tube water manometer during thoracentesis and diagnosing non-expandable lung.

Methods: Thirty-three consecutive patients undergoing thoracentesis were enrolled in the study. Pleural pressure (Ppl) measurements were made by using a disposable handheld digital manometer (DM, Mirador Biomedical, Seattle, WA), electronic transducer system (ET), and a U-tube water (UT) manometer. End expiratory Ppl was recorded after catheter insertion, after every 240 mL of fluid aspiration, and prior to catheter removal. Volume of fluid removed, symptoms during thoracentesis, pleural elastance, radiographs, and fluid chemistries were also evaluated.

Results: 594 Ppl measurements were made in thirty patients during their thoracentesis. There was a strong correlation between elastance for the DM and ET ($R^2=0.9582$, $P<0.001$). Correlation was poor for UT and ET ($R^2=0.0448$, $p=0.84$). Among the 15 patients with cough, recorded transducer manometer pressures ranged from -9 to +9 cmH₂O at the time of symptom development, with a mean (SD) = -2.93 (4.89) cmH₂O. Nine patients developed chest discomfort and had recorded transducer manometer pressures that ranged from -26 to +6 cmH₂O, with a mean (SD) = -7.89 (9.97) cmH₂O.

Conclusion: The digital manometer provided a valid method to measure pleural pressures during thoracentesis.

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Estimated Slopes for All three instruments

