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# Pressure relief technique to achieve endotracheal tube cuff pressures within the recommended range

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**2021**
https://hdl.handle.net/10539/33684

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# Abstract

### Study Objective

The complications of both high and low endotracheal tube (ETT) cuff pressure have been well documented. A number of ETT cuff pressure estimation techniques have been employed by practitioners in the absence of a manometer, particularly in resource-limited settings. These techniques have largely been shown to be unreliable. The pressure relief technique (PRT) has been described, with variations in the exact method. This study aims to determine if PRT can achieve ETT cuff pressures within the recommended range.

### Design

A cross-sectional study was performed.

### Setting

The study took place in the theatre complex of Chris Hani Baragwanath Academic Hospital in Johannesburg, South Africa.

### Patients

Included in the study were 146 adult surgical patients undergoing general anaesthesia.

### Interventions

The PRT, using a predetermined, standardised volume of air, was performed by over-inflating the ETT cuff and then allowing the plunger of the syringe to recoil until it stopped moving.

### Measurements

ETT cuff pressure was measured with a manometer and recorded. The volume of air remaining in the ETT cuff was calculated and recorded.

## Main Result

A statistically significant number, 93 (63.7%), of ETT cuff pressures fell within the recommended range. A minimum ETT cuff pressure of 12 $cmH_2O$ and a maximum of 42 cmH2O was recorded. ETT brand had a significant impact on ETT cuff pressure ($p=0.001$). The volume of air remaining in the ETT cuff, after the PRT was performed, was significantly impacted by the brand ($p<0.0005$) and size ($p<0.0005$) of ETT.

## Conclusions

While the manometer remains the gold standard in ensuring ETT cuff pressures within the recommended range, in the absence of a manometer, the PRT yields a statistically significant number of ETT cuff pressures within the recommended range.