INTRODUCTION: The endotracheal tube (ETT) and laryngeal mask airway (LMA) have found widespread use in the operating room (OR) but are also linked to potential complications including trauma to the lips, teeth, tongue, and laryngeal structures [1]. More specifically, high cuff pressures (>30cm H2O for ETT, >60cm H2O for LMA) have been shown to be associated with sore throats, mucosal ulcers, tracheal stenosis, and vocal cord paralysis [2,3]. Studies have shown decreased incidence of these events with use of a cuff manometer [4,5]. The 2015 Canadian Anesthesiologists’ Society (CAS) “Guidelines to the Practice of Anesthesia” added a cuff pressure manometer to the list of “immediately available” monitors[6]. As such, our department acquired two cuff manometers in each operating room sterile core. The objective of this quality improvement (QI) study was to measure ETT and LMA cuff pressures and survey resident and staff anesthesiologists about their use of the cuff manometer.

METHODS: Following institutional research ethics opinion that this QI initiative did not constitute human participant research, we performed an observational study at two tertiary health care centres between April and May 2016. All operating rooms were visited once a day. When present, ETT or LMA cuff pressures were measured in adults (>18 years) having elective, non-cardiac surgery. An anonymous survey regarding cuff measurement practices was also completed at the same time. Exclusion criteria included use of nitrous oxide, previous tracheal, laryngeal, or neck surgery.

RESULTS: 129 ETT and LMA cuff measurements revealed 28.7% of ETT and 57% of LMA pressures (Figure 1) were higher than the recommended maximum. 66 individual survey responses were recorded. Palpation was the most popular method to determine appropriate ETT cuff pressure (43.1%) compared to minimum occlusive pressure for LMA (44.3%). Over half (51.5%) of respondents were aware of the presence of cuff manometers; over three-quarters (75.8%) reported using the manometer once a month or less. 87.9% of respondents would use a manometer more often if more readily available.

DISCUSSION: Following the addition of cuff manometer use to CAS Guidelines, over a quarter of ETT and half of LMA cuff pressures were found to be higher than recommended. Most users surveyed reported rarely or never using the cuff manometer. More frequent use of the manometer would occur if it was more accessible. Due to the wide range of potential adverse effects from cuff over-inflation, one could consider a simple system-wide solution of providing cuff manometers in every operating room.
Histogram of cuff pressure measurements. Maximum recommended pressure for ETT is 30cm H2O and LMA is 60cm H2O