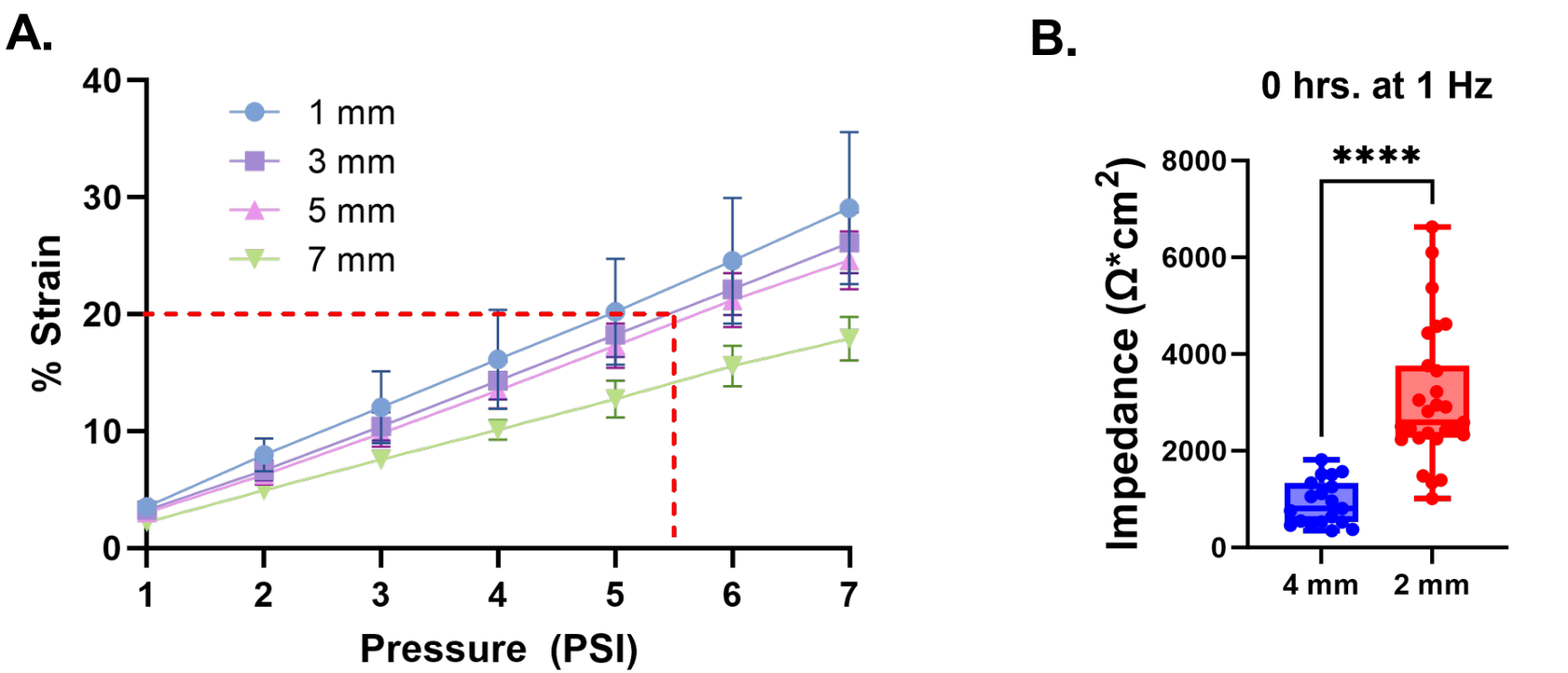
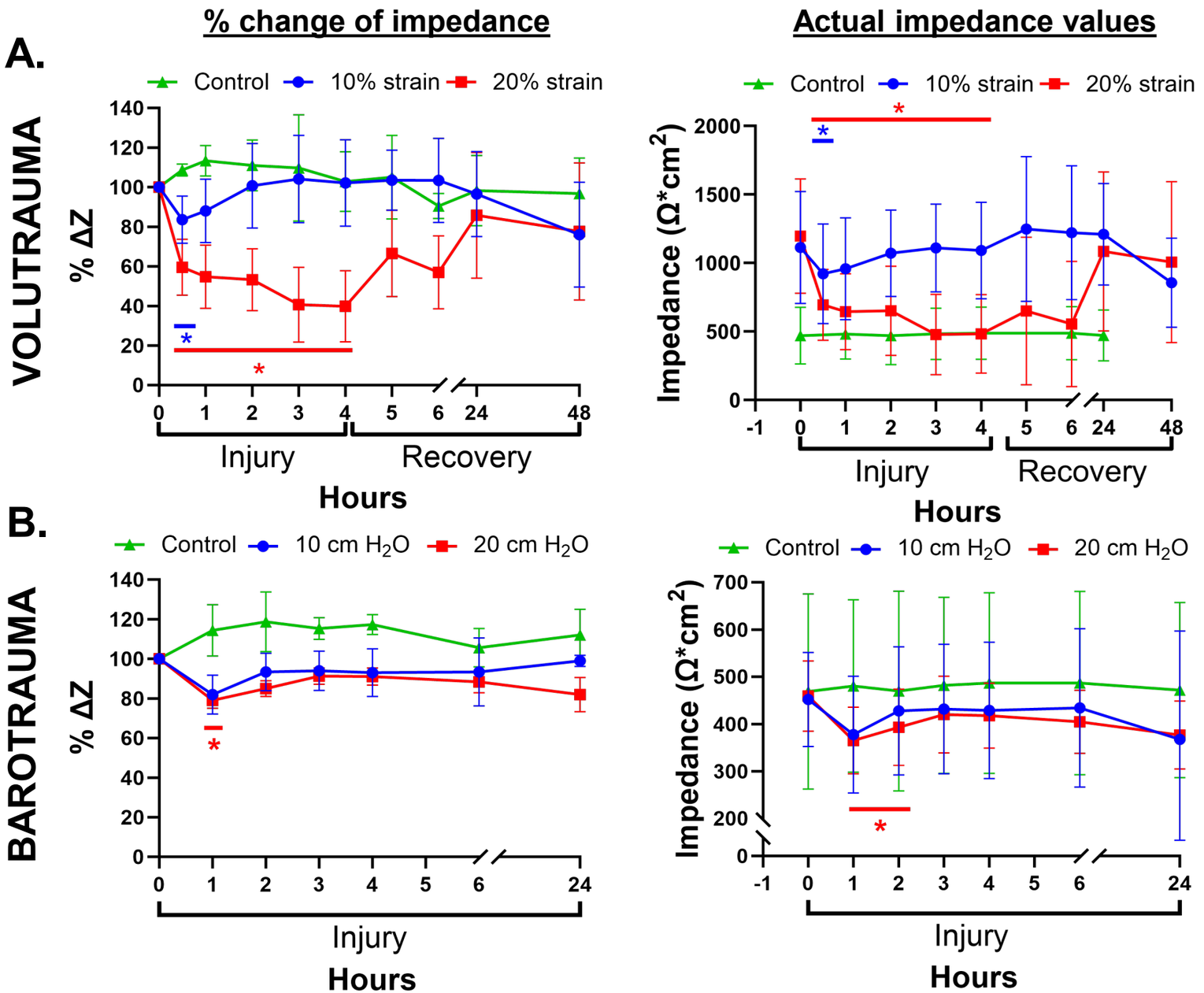
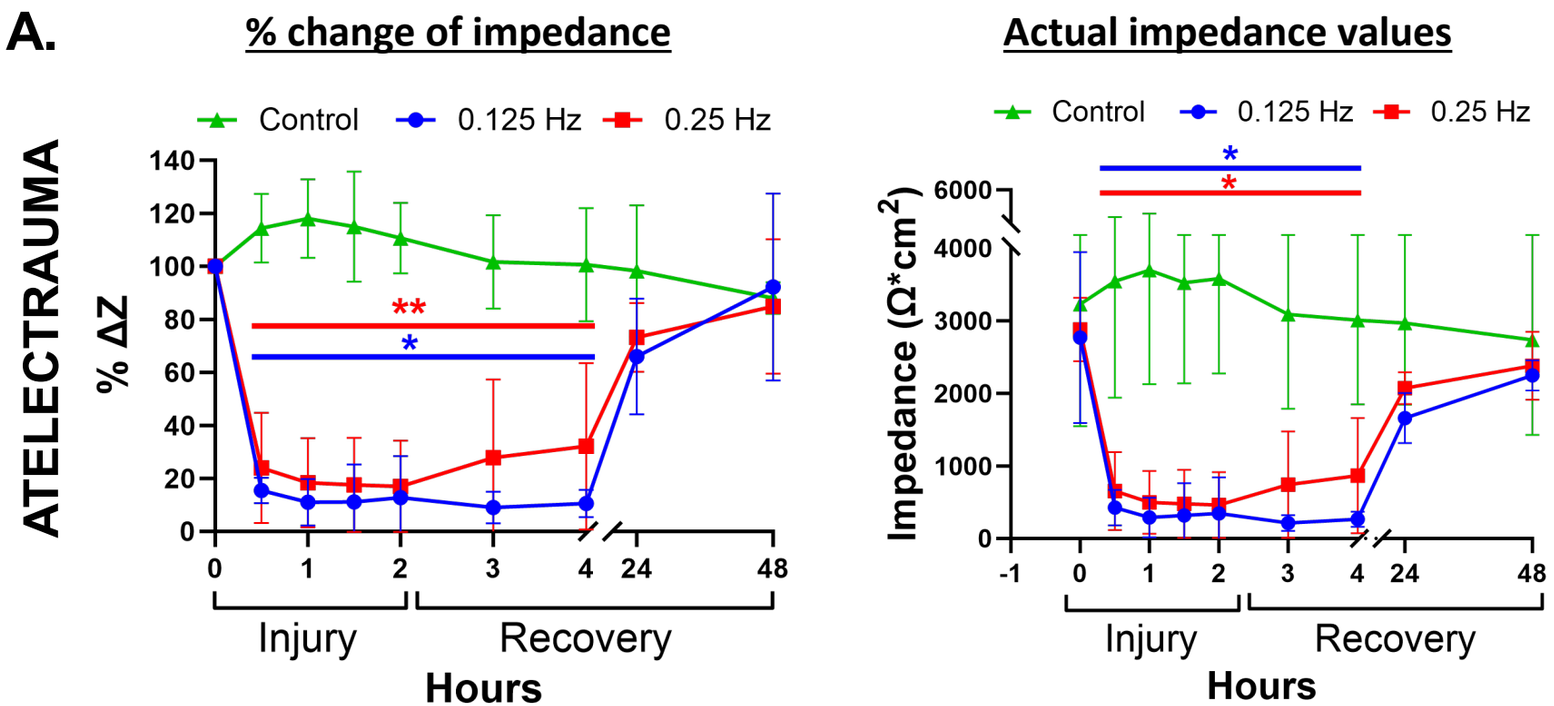


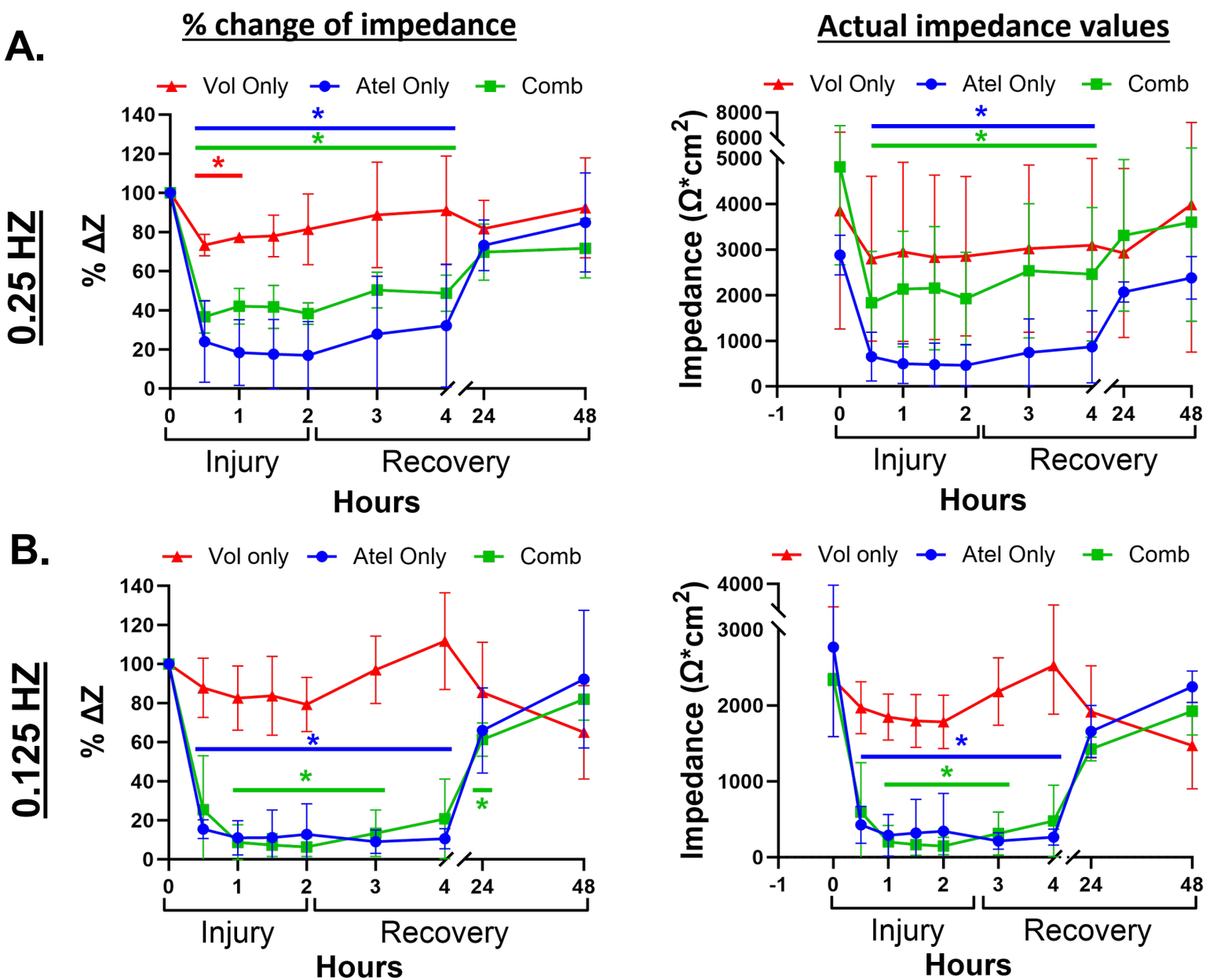

**Supplementary Figure 1. A) Calibration of membrane stretch (% strain) with applied vacuum pressure (PSI). B) Channel geometry alters zero-hour timepoint impedance measurements.** Geometry analysis was performed for all zero-hour impedance measurements at 1 Hz for 2 mm and 4 mm apical channel heights. Data was not normally distributed as tested by Shapiro-Wilk's test. Data were analyzed by Mann-Whitney nonparametric test. ****p<0.0001. Data presented as box and whisker plot. Min to max with all points shown.




**Supplementary Figure 2. Actual impedance values vs. the reported % change of impedance for all volutrauma and barotrauma show similar trends and statistical significance.** Percent change of impedance and actual impedance values at 1 Hz were plotted for **A.** volutrauma and **B.** barotrauma. Statistical analysis was performed as described in Figure 4.




**Supplementary Figure 3. Actual impedance values vs. the reported % change of impedance for atelectrauma show similar trends and statistical significance.** Percent change of impedance and actual impedance values at 1 Hz were plotted for **A.** atelectrauma. Statistical analysis was performed as described in Figure 5.




**Supplementary Figure 4. Actual impedance values vs. the reported % change of impedance for our combined injury model show similar trends and statistical significance.** Percent change of impedance and actual impedance values at 1 Hz were plotted for our combined injury model at **A.** 0.25 Hz and **B.** 0.125 Hz. Statistical analysis was performed as described in Figure 6.