Laparoscopic Post-Operative Pain: A Basic Scientific Approach Investigating the Removal of Carbon Dioxide Gas from the Abdominal Cavity

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Problem: Post-operative pain exists following laparoscopic surgery due to trapped carbon dioxide gas. Purpose: Design a system to simulate the abdomen and test multiple methods that have the potential to expedite reduction of carbon dioxide gas in the chamber. Hypothesis: Creation of an air-tight chamber able to maintain a gas is feasible. It is likely that methods exist that will decrease the presence of carbon dioxide gas in a sealed chamber. Procedure: Create an air-tight chamber. Assess decreases in carbon dioxide gas presence in the chamber with the concurrent application of natural dissapation, water, algae, activated carbon, heat and suction. Simulate intestines with packing peanuts and oiled spaghetti in the suction experiments. Results: Suction experiments produced the largest decrements in carbon dioxide gas. Suction apparatus equipped with a molded mesh screen was the most successful method overall. the other methods employed showed no decreases in carbon dioxide presence even with extrapolated time. Conclusion: Expedited carbon dioxide removal can be achieved with suction. Suction methods are most successful when a molded mesh screen is used to minimize known issues with clogging due to simulated abdominal contents.

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