

CO2 versus Air Insufflation in Routine Screening Colonoscopy in the Outpatient Setting

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Background/Framework

- The American Cancer Society estimates that 101,420 new cases will be colon cancer, the second most common cause of cancer deaths and the third most common cancer (American Cancer Society, 2019)
- Adequate colon distention for full gastrointestinal visualization is achieved via air insufflation or carbon dioxide (CO₂) insufflation.
- Air is associated with increased discomfort/abdominal pain and increased length of procedure time (LPT), when compared to CO₂ (De-Quadros et al., 2017)
- CO₂ insufflation has been shown to reduce procedure related pain and discomfort during colonoscopy (Idia et al., 2013)
- At the outpatient Endoscopy Center at Hackensack University Medical Center, approximately 800 patients undergo routine screening colonoscopy annually (unit statistics, 2018)
- The use of CO₂ to insufflate the gastrointestinal tract for routine colonoscopy screening is not standard practice. Therefore, the goal of this project is to compare abdominal discomfort, as defined by pain scores, and procedural length of time among adult patients receiving routine screening colonoscopy with insufflation by air and CO₂.



Significance/Purpose

- The Endo nurses conducted a retrospective chart review comparing patient outcomes in air vs CO2 insufflation.
- Promoting the implementation of CO2 insufflation with the intention of sharing results with the endoscopists.
- The eventual practice change with the best evidence available.



EBP Question

Is there a difference in the procedural, recovery, room, and total length of time (LOT) and Stanford Pain duration, when comparing air versus CO2 insufflation during routine screening colonoscopy in patients in the outpatient setting?

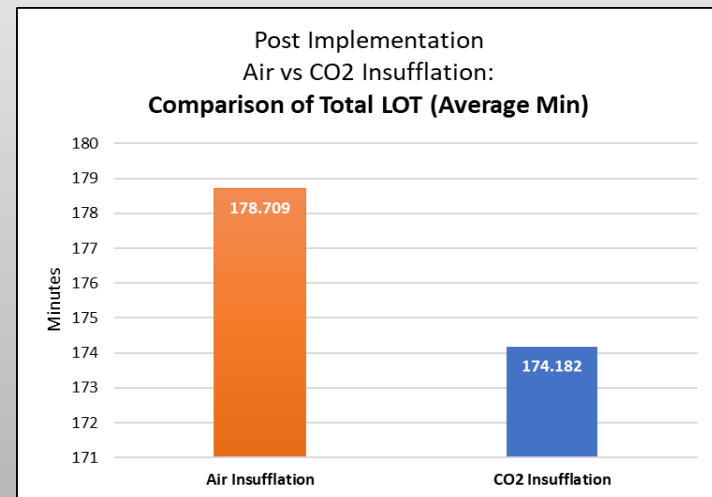
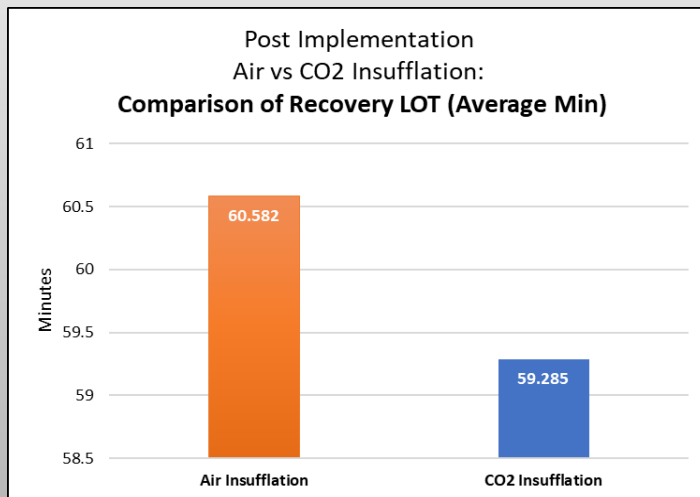
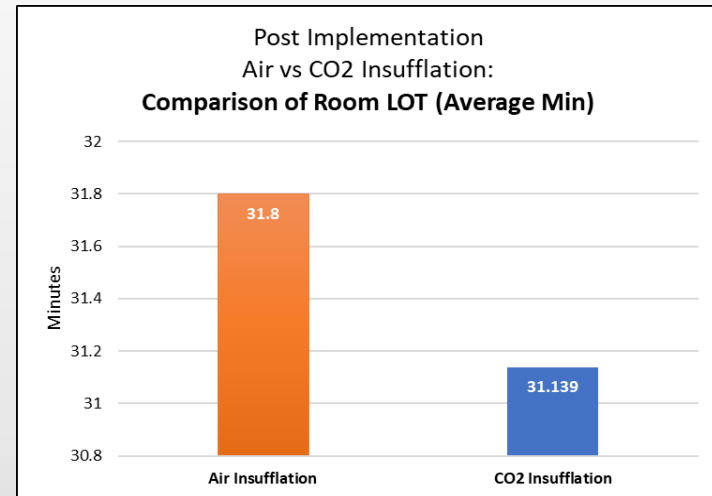
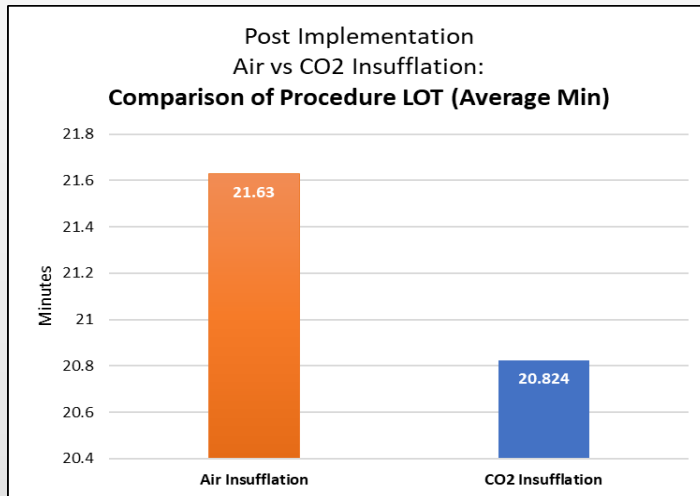


Methodology

- In 2019, patient outcomes for random sampling of 296 patients (148 Air, 148 CO₂) were compared using T-Tests for Two-Sample Assuming Unequal Variances.
- PICOT
 - **Patient/Population:** Adult patients (40 years or older) undergoing routine screening colonoscopy with air or CO₂ insufflation in the outpatient Endoscopy unit.
 - **Intervention:** Insufflation by CO₂
 - **Comparison:** Insufflation by Air
 - **Outcomes:**
 - Procedure LOT – duration of endoscopic procedure
 - Room LOT – duration of time patient is in procedure room
 - Recovery LOT – duration of time patient is in recovery
 - Total LOT– duration of time in outpatient unit from admission to discharge
 - Stanford pain scale duration (min) – measured from documented time of patient's pre-procedural pain score equaling zero till documented time of patient's post-procedural pain score equaling zero.
 - **Timeframe:** 6 months implementation (June 15, 2019 – December 15, 2019)



Results

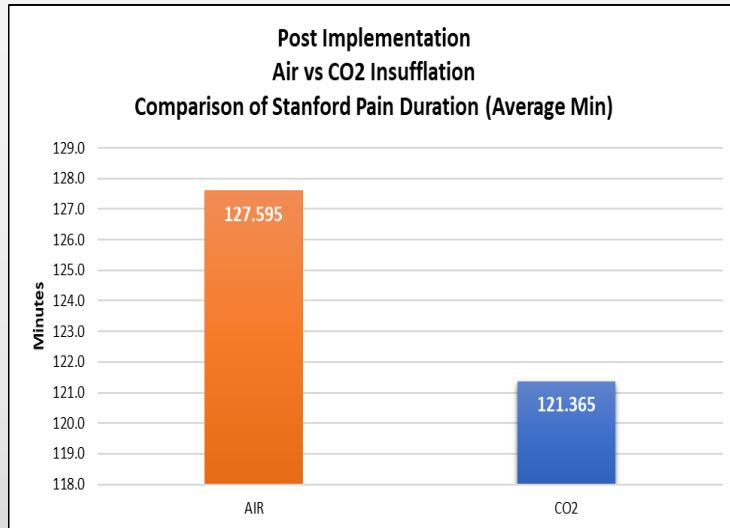


Results (cont'd)

	Average Time AIR (N = 165)	Average Time CO ₂ (N = 165)	Difference in Average Time	P Value	Aggregate Difference in Avg Time (Difference x N)
Procedure LOT	21.6 minutes	20.8 minutes	0.8 minutes	0.4749	132 minutes (2 hrs, 12 min)
Room LOT	31.8 minutes	31.1 minutes	0.7 minutes	0.5788	115.5 minutes (1 hr, 55.5 min)
Recovery LOT	60.6 minutes	59.3 minutes	1.3 minutes	0.6360	214.5 minutes (3 hrs, 34.5 min)
Total LOT	178.7 minutes	174.2 minutes	4.5 minutes	0.2849	742.5 minutes (12 hrs, 22.5 min)



Results – Pain



- Stanford Pain Duration for CO₂ insufflation averaged 121.4 minutes, 6.2 minutes less than Air averaged 127.6 minutes
- Clinically significant but not statistically significant (p-value >0.05)

	Average Time AIR (N = 148)	Average Time CO ₂ (N = 148)	Difference in Average Time	P Value	Aggregate Difference in Avg Time (Difference x N)
Stanford Pain Scale Duration	127.6 minutes	121.4 minutes	6.2 minutes	0.1926	917.6 minutes (15 hrs, 17.4 min)



Conclusions

The clinical significance demonstrated improved patient outcomes and made the case for a practice change.



Discussion/Implication

- While the average differences in LOT for CO₂ Insufflation was clinically significant, they were not statistically significant.
 - Statistical significance was impacted by the size of the samples. A larger sample size could provide a more precise analysis and thereby impact the statistical significance.
 - Although Recovery LOT indicated the largest difference in time duration, it may have been as a result of factors not specific to the procedure. Extraneous variables/ factors could not be isolated in the analysis.



References

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