A 4-arm randomized controlled trial of Fuse, EndoCuff, EndoRings and standard colonoscopy for improving adenoma detection rates.

Protocol:

Introduction:

ADR (Adenoma detection rate or percentage of patients with at least one adenoma among all colonoscopies performed by a doctor) was first proposed as a quality indicator 12 years ago. It has now been validated as an excellent marker for the risk of interval colorectal cancer (cancer occurring after colonoscopy). Although colonoscopy offers protection from colorectal cancer for at least a decade and more, this protection has been shown to vary depending on the location and type of pre-cancerous lesions and the training and skill of the doctor performing the procedure. A recent large study of more than 200,000 colonoscopies found that every 1% increase in ADR resulted in a decrease of interval CRC by 3% and fatal interval CRC by 5%. Although the increase was linear the effect was more pronounced once the ADR reaches 28% and continued beyond till 52%.

Measures to improve ADR are therefore a worthy goal to study. Recent studies indicate that continuing medical education, time of colonoscopy during the day, forced longer withdrawal time, use of high definition colonoscopes all result in improving ADR although the gains have only been modest. To this end, adding novel devices to the tip of colonoscope may improve the ability of doctors to perform a better procedure. We therefore propose to identify the increase in ADR with 3 of these devices compared to standard colonoscopy. Fuse colonoscopy (2 cameras embedded at the side of the colonoscope tip providing an increased angle of view), EndoCuff (a plastic cap to fit the tip with flexible arms which hold the mucosa back aiding in inspection), EndoRings (similar to EndoCuff but the arms are wider) have been shown in tandem colonoscopy studies to improve the adenoma miss rates to 7-15%

instead of the miss rates seen with standard colonoscopy which is usually about 40%. All these devices are FDA approved and are distributed in the United States.

Methods:

Persons scheduled for a standard screening, surveillance or diagnostic colonoscopy at the Glen Lehman Endoscopy Suite will be invited to participate in the study after a member of the research team explains the risks, benefits and the choice of not participating in research.

If the patient qualifies after being screened for exclusion criteria as listed below, they will be given an informed consent document and an authorized HiPAA form to sign. Once both documents are signed, a copy will be provided to the patient and then the patient is randomized to undergo a standard colonoscopy, a Fuse colonoscopy, colonoscopy with EndoCuff or a colonoscopy with EndoRings.

Study procedures:

Patients will undergo a split dose bowel preparation starting the evening before the procedure day and ending at least 4 hrs. prior to the procedure. Patients with medical indicators of inadequate bowel preparation are given a more intensive regimen sometimes doubling the dose of preparation drug. Patients agreeing to participate will be randomized to one of the four study arms prior to initiation of colonoscopy.

A colonoscope will be introduced and advanced to the cecum at which time a research assistant will note the time taken to achieve this. Once the withdrawal starts, the same assistant will start a stop watch which will be stopped for any cleaning of the bowel or polypectomy procedures. In this way inspection time can be monitored for all arms of the study.

After randomization, a patient can be withdrawn due to condition discovered during colonoscopy which places the patient in the exclusion criteria, an inadequate bowel preparation as determined by the performing doctor or a request from the patient to be withdrawn.

Inclusion criteria:

Screening colonoscopy, Surveillance colonoscopy or diagnostic colonoscopy and >=50 years of age

Exclusion criteria:

Any personal h/o large bowel resection, inflammatory bowel disease, or polyposis syndromes

Any family h/o polyposis syndromes

Referral for an incomplete exam or polyp clearance

Referral for a FOBT+ testing in the last 6 months

Anticipated difficult colonoscopy

Statistical analyses:

We will perform analyses on the data after randomization and prior to withdrawal (intention to treat) and on data of patients completing the study (excluding the withdrawal patients, per protocol).

The primary aim of increased ADR detection will be tested using a chi-square test among the four groups.

The secondary aims of cecal intubation rates, cecal insertion time and detection of serrated and flat lesions will be tested using chi-square, t-test, and chi-square respectively.

All analyses will be performed on SPSS Version 20 (IBM, NY).

Sample size:

The ADR of the principal investigator has averaged about 40% in published studies. We hope to achieve a 10% increase in the ADR with these newer devices when compared to standard colonoscopy.

Using a 4-arm RCT, to detect a 10% increase from a baseline of 40%, we require 388 patients in each arm at an ά level of 0.05 with 80% power (n=1552). To account for the withdrawals after randomization, which would amount to an average of 6% per our recent studies, we will need to enroll 412 patients in each arm (n=1648).

Ethical considerations:

All protocols will be approved by the local IRB before starting the research study. An informed consent document will be provided to each patient to review for participating in the study. An express authorization to review medical data for research purposes will be obtained before randomizing any patient. All patients will be provided with a contact number in case of questions or if they wish to inform of their intent to be withdrawn.

Adverse events:

The primary investigator will monitor any adverse event reported to the study staff and determine if it's related to the study procedures including standard colonoscopy. All adverse events will be monitored until a satisfactory resolution and will be reported to the IRB within 5 days of knowledge.

A table will be maintained for the adverse events in each arm and in case of any statistically significant adverse event rate in any arm, the primary investigator will make the decision to remove the treatment arm or stop the study.

Data integrity and safety:

All paper charts pertaining to the patient will be kept under lock and key in coordinators office away from the endoscopy area. The data entry will be performed into an excel file which will be stored on an internal network drive with encryption and password security. Only approved personnel by the IRB will have access to the file storage. This file will also not have any identifiable information (name, DOB or mrn). A study log with the identifiable information will be kept in a separate folder (also encrypted) to enable the investigators to assist in any research audit. No procedural data except the date of examination will be entered into this log.