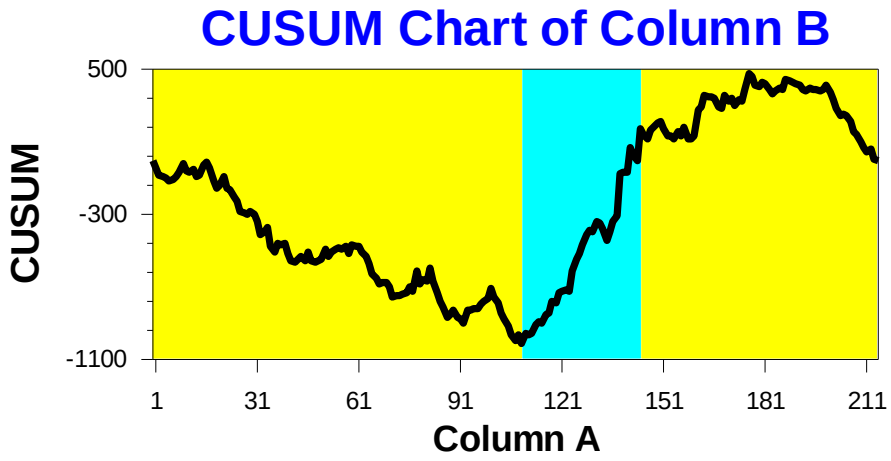
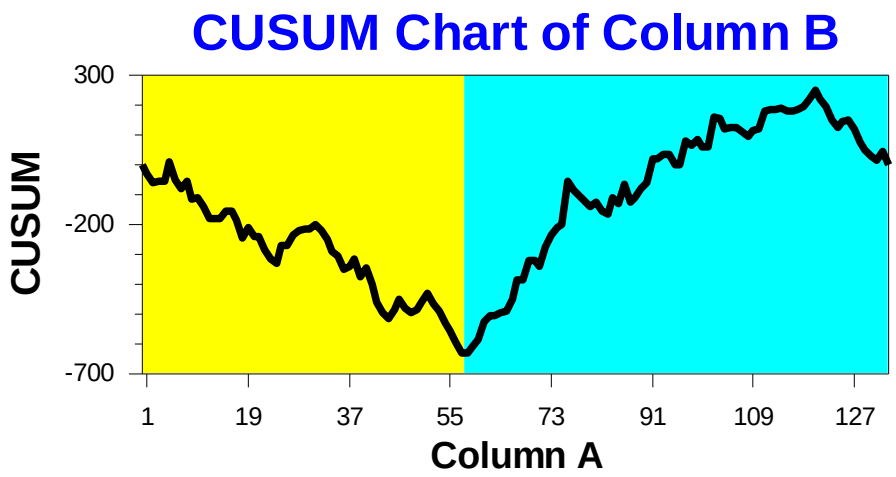
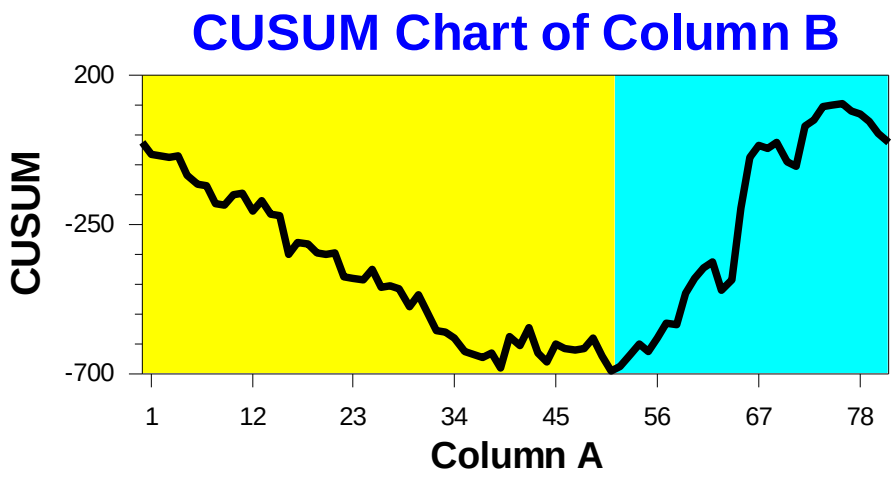


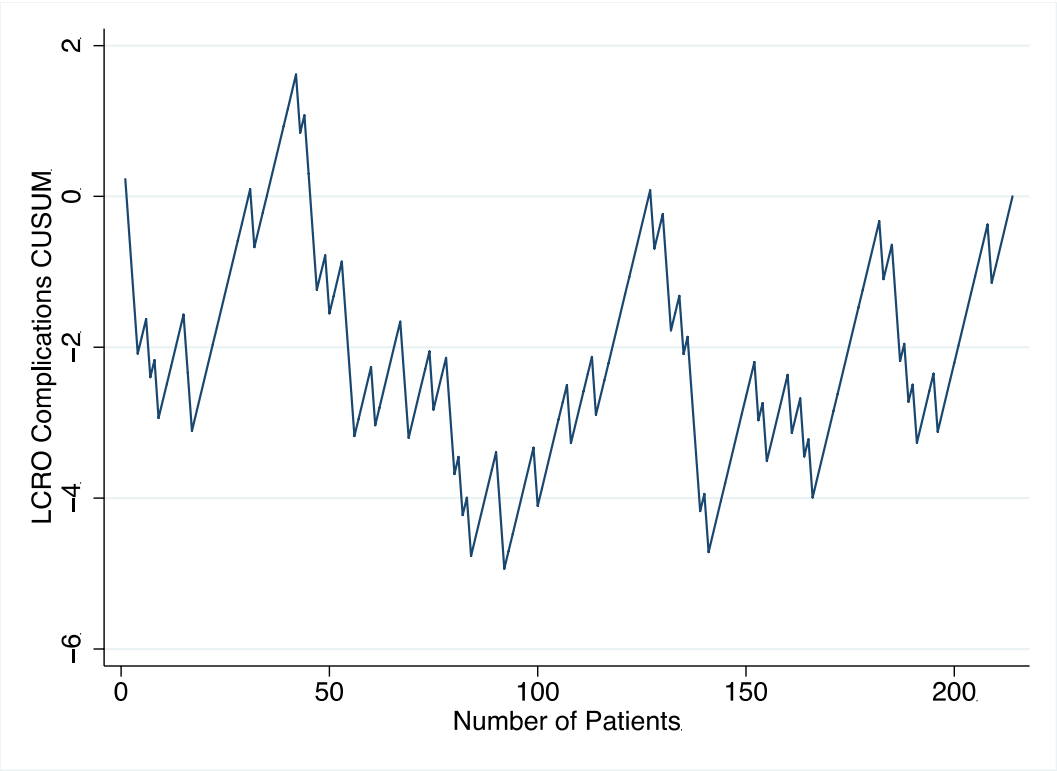
Supplementary Material Figure 1. LCRO operation duration CPA analysis



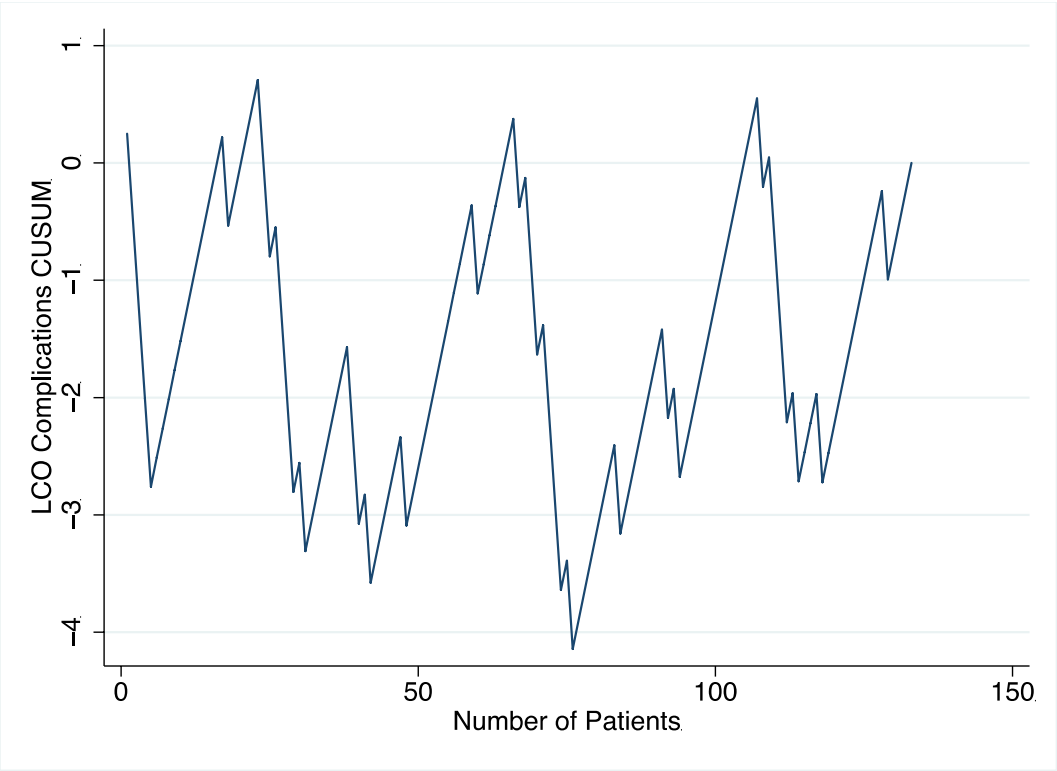
Supplementary Material Figure 2. LCO operation duration CPA analysis



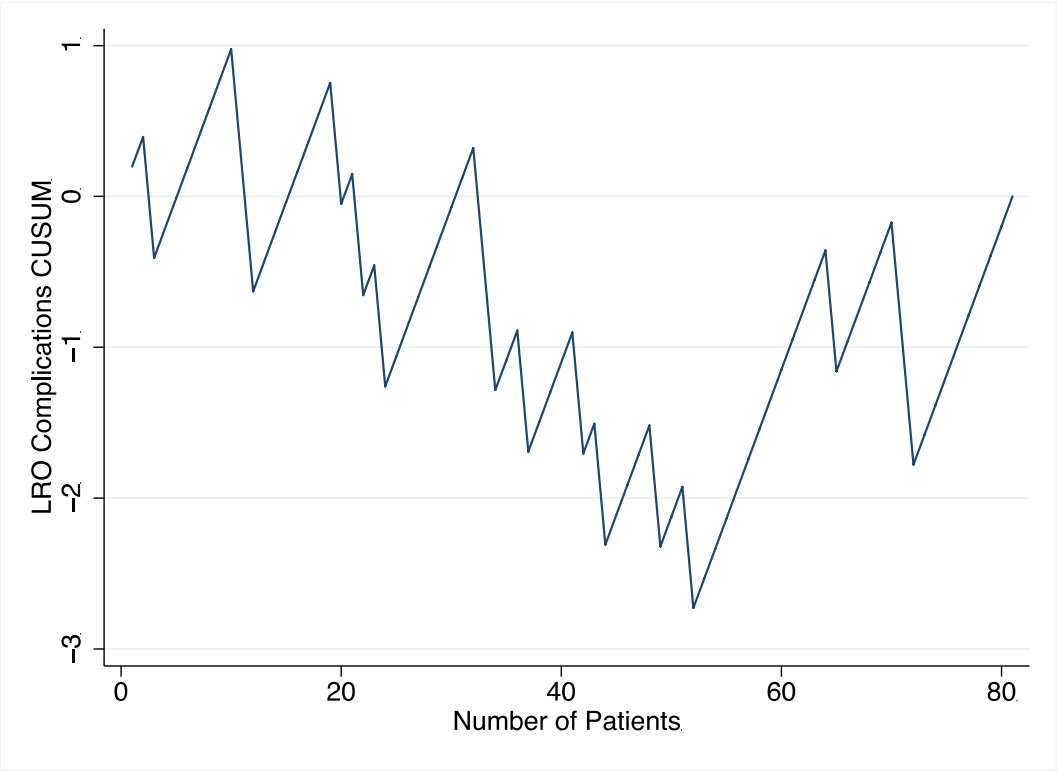
Supplementary Material Figure 3. LRO operation duration CPA analysis



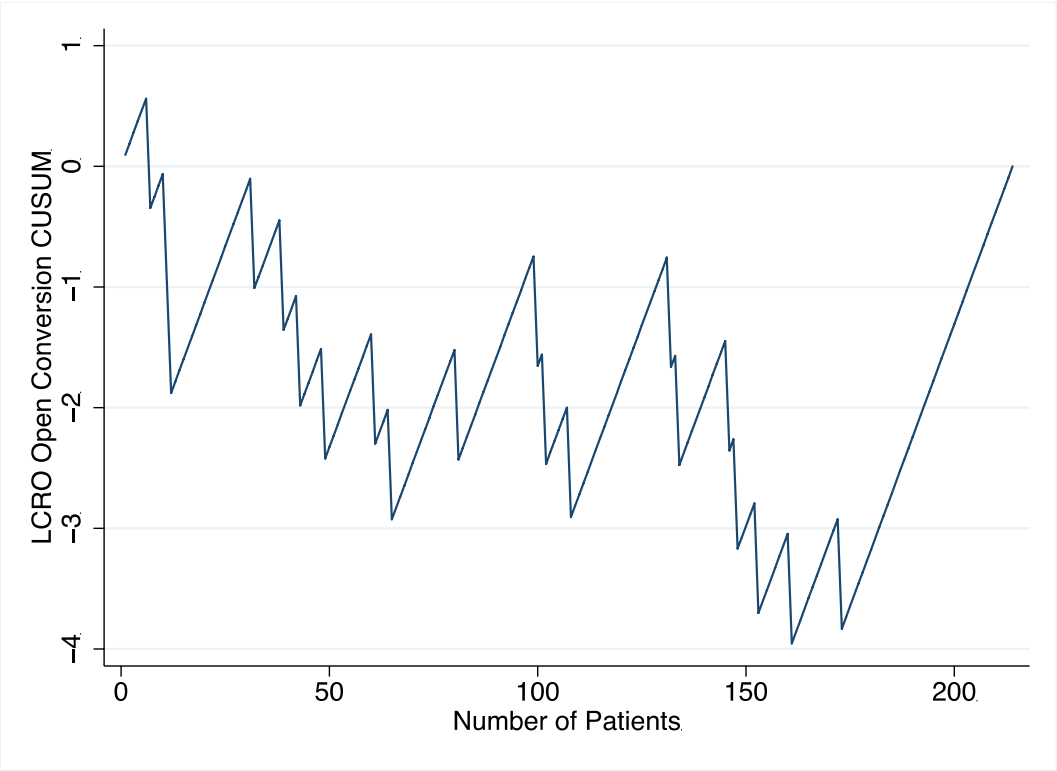
Supplementary Material Figure 4. LCRO complication rate CUSUM analysis



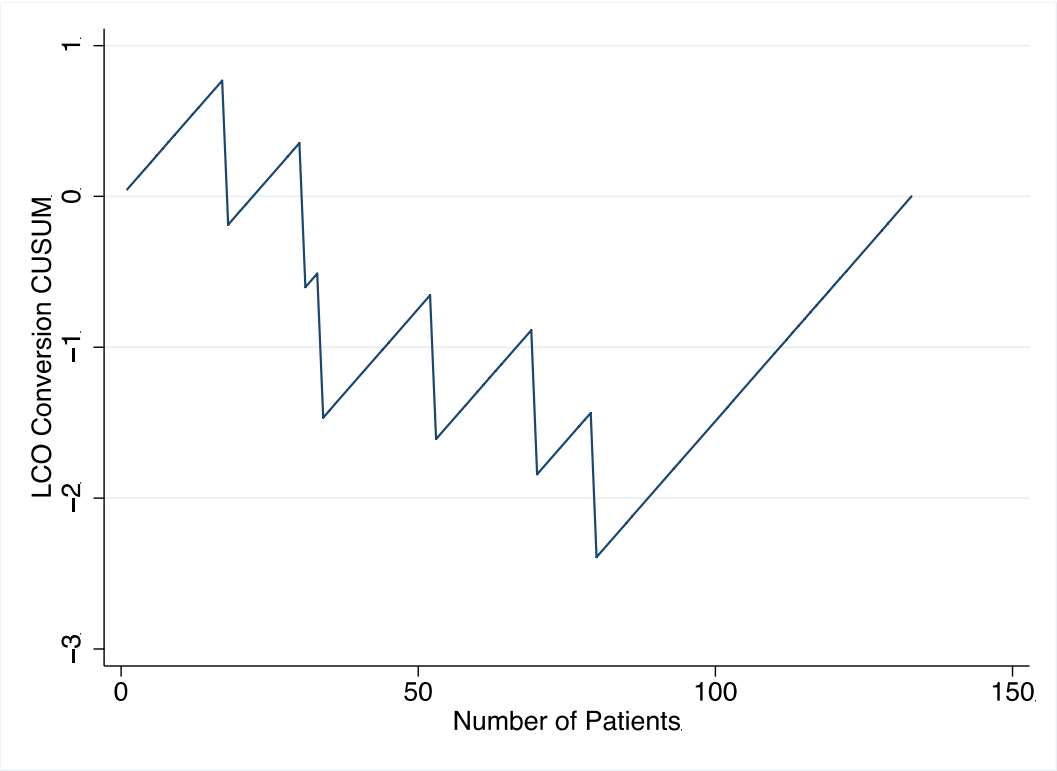
Supplementary Material Figure 5. LCO complication rate CUSUM analysis



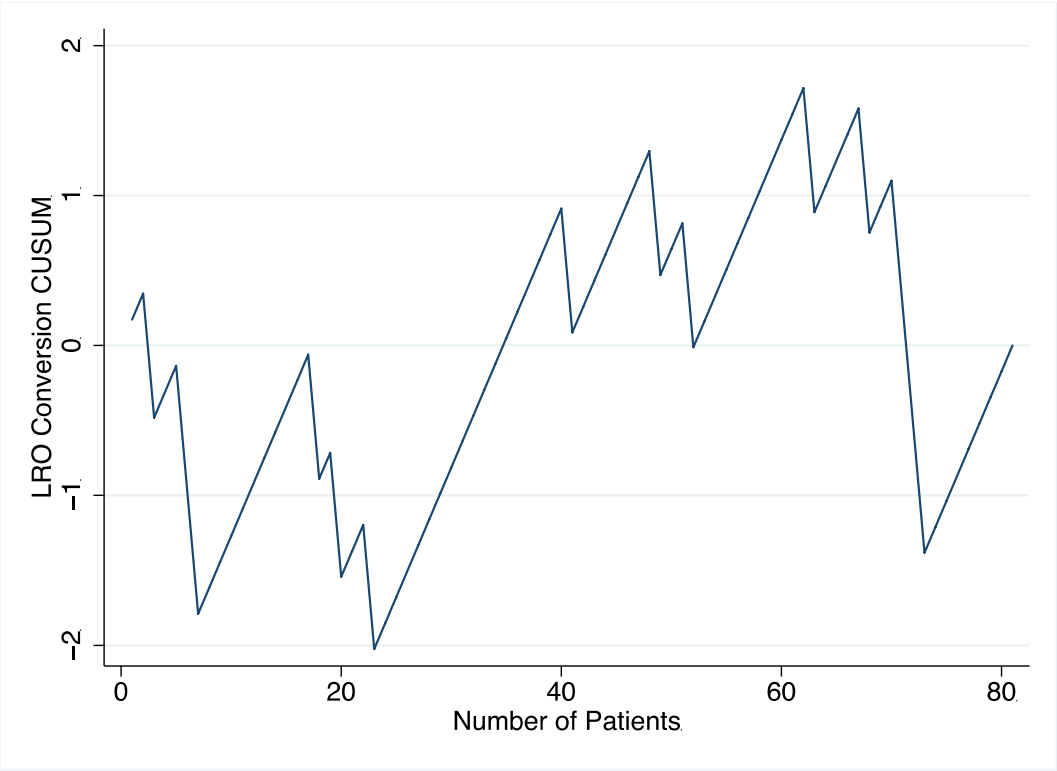
Supplementary Material Figure 6. LRO complication rate CUSUM analysis



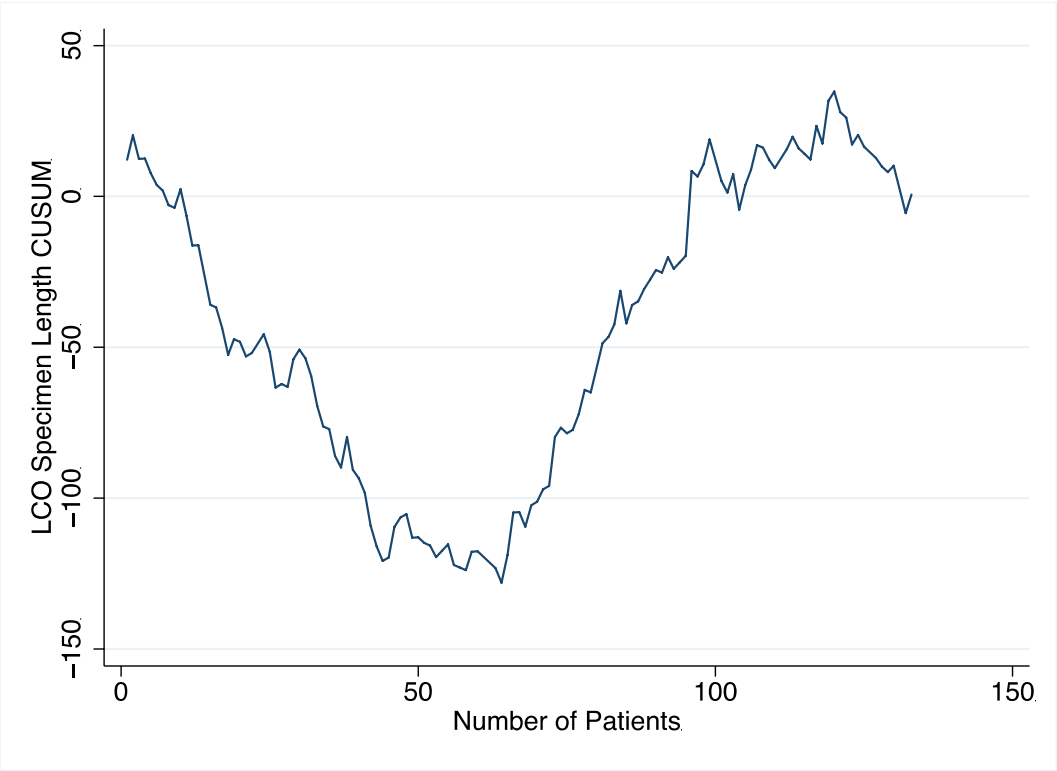
Supplementary Material Figure 7. LCRO open conversion rate CUSUM analysis



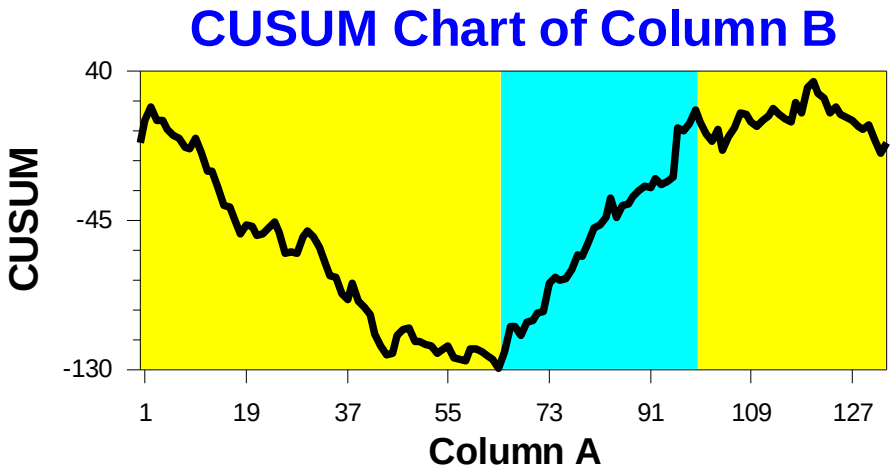
Supplementary Material Figure 8. LCO open conversion rate CUSUM analysis



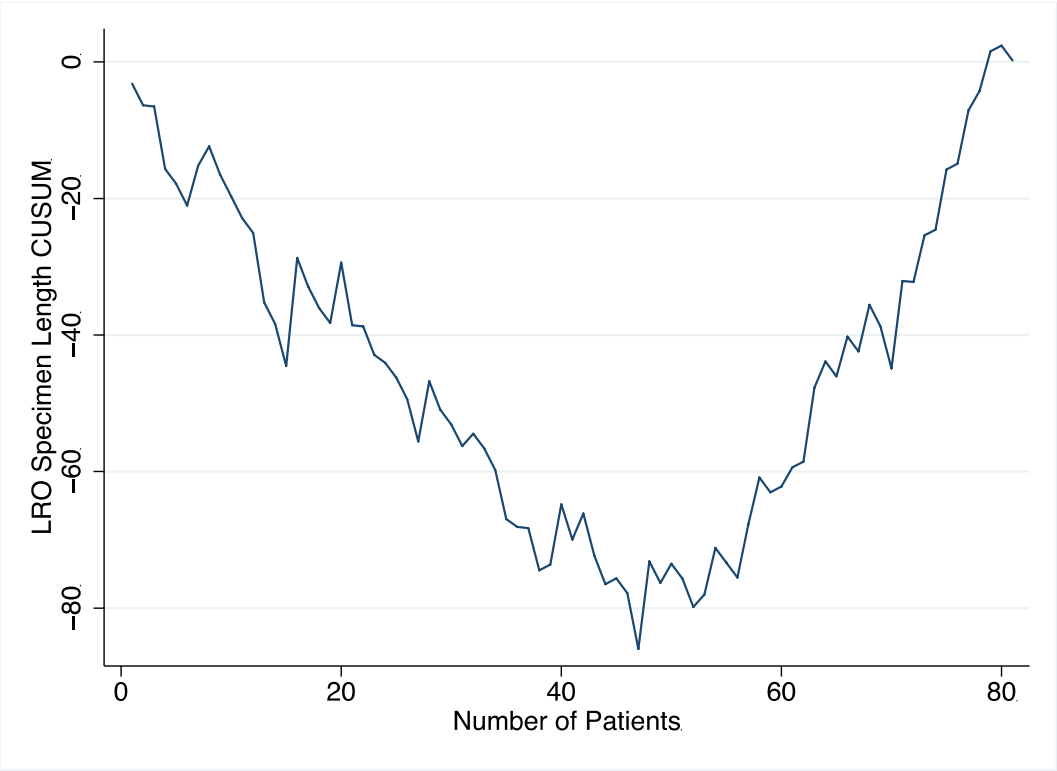
Supplementary Material Figure 9. LRO open conversion rate CUSUM analysis



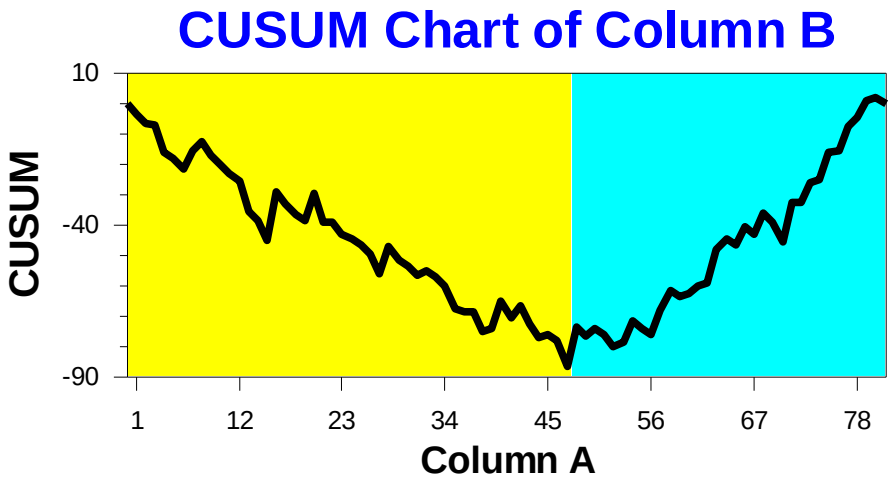
Supplementary Material Figure 10. LCO specimen length CUSUM analysis



Supplementary Material Figure 11. LCO specimen length CPA analysis

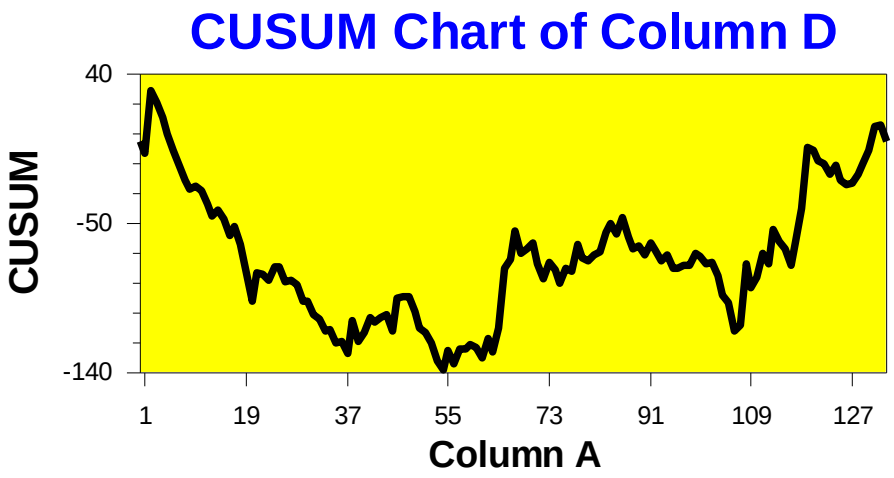


Supplementary Material Figure 12. LRO specimen length CUSUM analysis

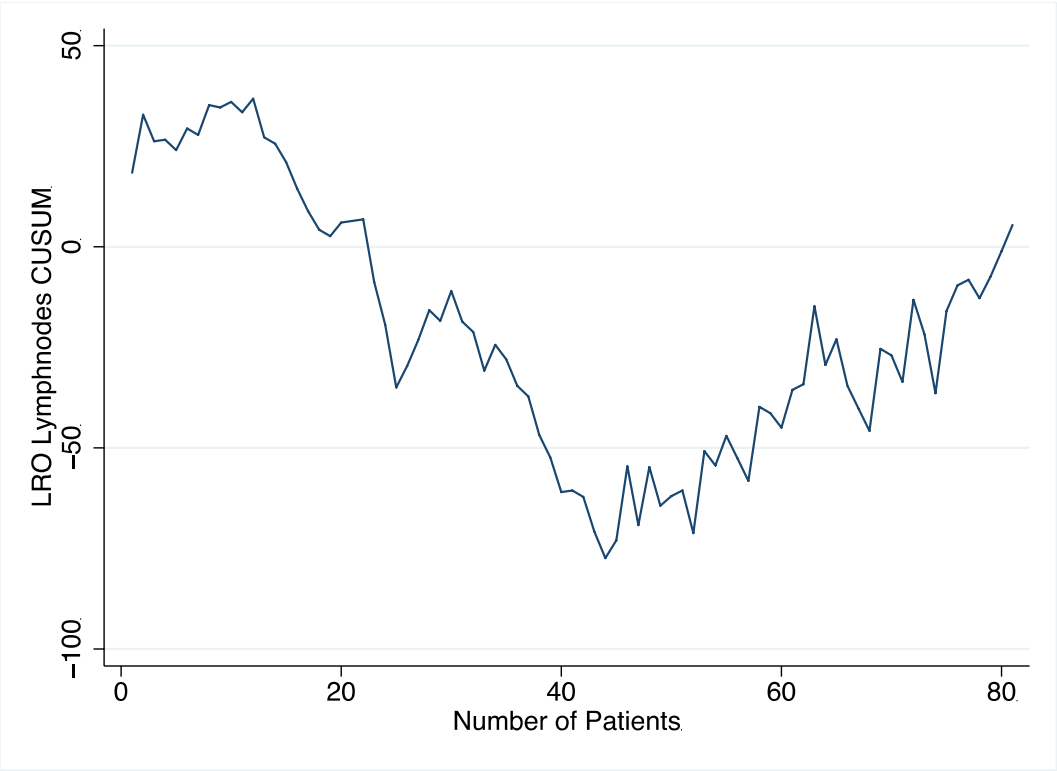


Supplementary Material Figure 13. LRO specimen length CPA analysis

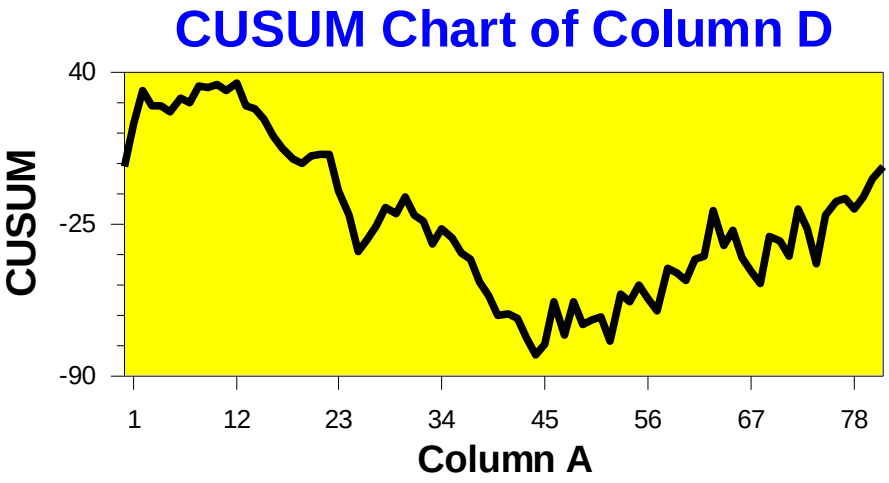
Supplementary Material Figure 14. LCO lymphnodes CUSUM analysis



Supplementary Material Figure 15. LCO lymphnodes CPA analysis



Supplementary Material Figure 16. LRO lymphnodes CUSUM analysis



Supplementary Material Figure 17. LCR lymphnodes CPA analysis

	Overall				Colon				Rectal		
	Spearman's P	*Subgroups*	*Operation Duration*		*Spearman's P*	*Subgroups*	*Operation Duration*		*Spearman's P*	*Subgroups*	*Operation Duration*
Sex	0.002	Male	192.5(49)	**Sex**	0.015	Male	180(40)	**Sex**	0.015	Male	205(50)
		Female	180(50)			Female	160(40)			Female	180(40)
Diagnosis	0.01	Malignancy	180(50)	**Diagnosis**	0.04	Malignancy	180(50)	**Laparoscopic approach**	0.005	Totally laparoscopic	200(40)
		Diverticulitis	160(33)			Diverticulitis	160(33)			Laparoscopy assisted	220(50)
Distance from anal verge (cm)	<0.001			**Laparoscopic approach**	0.001	Totally laparoscopic	180(45)	**Neoadjuvant modality**	0.006	Yes	220(75)
Operation	0.001	Right colectomy	180(50)			Laparoscopy assisted	240(70)			No	200(54)
		Left colectomy	160(40)	**Neoadjuvant modality**	0.02	Yes	250	**Tattoo**	0.001	Yes	180(45)
		Sigmoidectomy	180(60)			No	180(50)			No	210(60)

		Low anterior resection	200(50)	**Tumor diameter (cm)**	0.006		**Protective stoma**	<0.001	Yes	210(40)
		Ultra low anterior resection	240(50)	**Histology specimen length (cm)**	0.001				No	160(44)
Laparoscopic approach	<0.001	Totally laparoscopic	180(50)							
		Laparoscopy assisted	230(50)							
Neoadjuvant modality	<0.001	Yes	240(60)							
		No	180(50)							
Tattoo	0.023	Yes	180(50)							
		No	180(50)							
Extraction site	0.005	Pfannenstiel	190(60)							
		Subumbilical	200(60)							
		Transumbilical	180(50)							
Stapled/ Handsewn Anastomosis	0.04	Stapled	190(50)							
		Handsewn	180(50)							

Intra/Extracorporeal	0.048	Intracorporeal	190(50)		
		Extracorporeal	180(50)		
Protective stoma	<0.001	Yes	210(50)		
		No	180(49)		
Tumor diameter (cm)	0.014				

Supplementary Material Table 1. Correlation of perioperative characteristics to LCRO operation duration using Spearman's Rank-Order test.

Item No.	Recommendation	Page No.

Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	4
		Introduction	
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	6
Objectives	3	State specific objectives, including any prespecified hypotheses	6
		Methods	
Study design	4	Present key elements of study design early in the paper	7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	7
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	7
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	n/a
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*7*
Bias	9	Describe any efforts to address potential sources of bias	n/a
Study size	10	Explain how the study size was arrived at	n/a
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	8

Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	8
		(*b*) Describe any methods used to examine subgroups and interactions	8
		(*c*) Explain how missing data were addressed	n/a
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	n/a
		(*e*) Describe any sensitivity analyses	n/a
		Results	
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	9
		(b) Give reasons for non-participation at each stage	n/a
		(c) Consider use of a flow diagram	n/a
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	9
		(b) Indicate number of participants with missing data for each variable of interest	n/a
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	n/a
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	*9-10*
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	*n/a*
		Cross-sectional study—Report numbers of outcome events or summary measures	*n/a*
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	9-10
		(*b*) Report category boundaries when continuous variables were categorized	n/a
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	9-10

		Discussion	
Key results	18	Summarise key results with reference to study objectives	11-13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	13
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-13
Generalisability	21	Discuss the generalisability (external validity) of the study results	11-13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	2,14

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Supplementary Material Table 2. STROBE Statement—checklist of items that should be included in reports of observational studies