

# Perioperative Complication Rates Following Neoadjuvant Chemoradiation in Pancreatic Adenocarcinoma

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## PURPOSE / OBJECTIVE(s)

- It is unclear if neoadjuvant chemotherapy or chemoradiotherapy increases rates of major perioperative complications.
- We hypothesized that early complication rates would be comparable among patients receiving neoadjuvant chemoradiation (neo-CRT), neoadjuvant chemotherapy alone (neo-CHT), or upfront surgery.

## MATERIAL & METHODS

This is a retrospective study of 315 pts with PDAC who underwent resection within a multidisciplinary pancreatico-biliary program at an academic tertiary referral center between 2011-2018.

Major complications were defined as:

- Major wound disruption
- Pneumonia
- Pulmonary embolism
- Ventilator required > 48 hours
- Acute renal failure/Progressive renal insufficiency
- Stroke
- Myocardial infarction
- Deep vein thrombosis,
- Clostridium difficile
- Sepsis/septic shock
- Death

Data were abstracted from the medical record, an institutional cancer registry and NSQIP databases. Outcomes were assessed using  $\chi^2$ , ANOVA, and two-tailed Student's t-tests.

## RESULTS

- There were 316 patients included in the study (neo-CRT (n=33), neo-CRT (n=48), upfront surgery (n=235).
- There were no statistically significant differences in overall perioperative complication rates between groups. There were significant differences between groups, individually, in regards to MI, acute renal failure/insufficiency, C. difficile infection, and sepsis.
- There was a statistically significant decrease in early post-operative pancreatic fistula formation in patients who underwent neo-CRT (p=0.024)
- There were no significant differences in perioperative deaths between groups: 2 perioperative deaths in the neo-CRT group (6.1%), 1 in the neo-CHT group (2.1%), and 10 in the upfront resection group (4.4%); p=0.67.

Age		Stage on presentation - no. (%)	
Median (range) - years	67 (29-86)	Borderline/Unresectable	70 (22%)
>= 70yr - no. (%)	124 (39%)	Resectable	244 (77%)
Male sex - no. (%)		Unknown	2 (1%)
Preoperative therapy - no. (%)		Vessel Reconstruction - no. (%)	
Chemotherapy	48 (15.2%)	Yes	87 (28%)
Chemoradiotherapy +/- Chemo	33 (10.5%)	No	187 (59%)
Upfront surgery	234 (74%)	Unknown	42 (13%)
RT Technique - no. (%)		Surgical Complications - no. (%)	
IMRT	13 (4%)	Yes	96 (30%)
Tomotherapy	5 (2%)	No	178 (56%)
3D-Conformal	8 (3%)	Unknown	42 (13%)
IMRT+HIRT	10 (3%)		
SBRT	4 (1%)		
Tomotherapy	1 (0.3%)		

Table 1. Patient and treatment characteristics

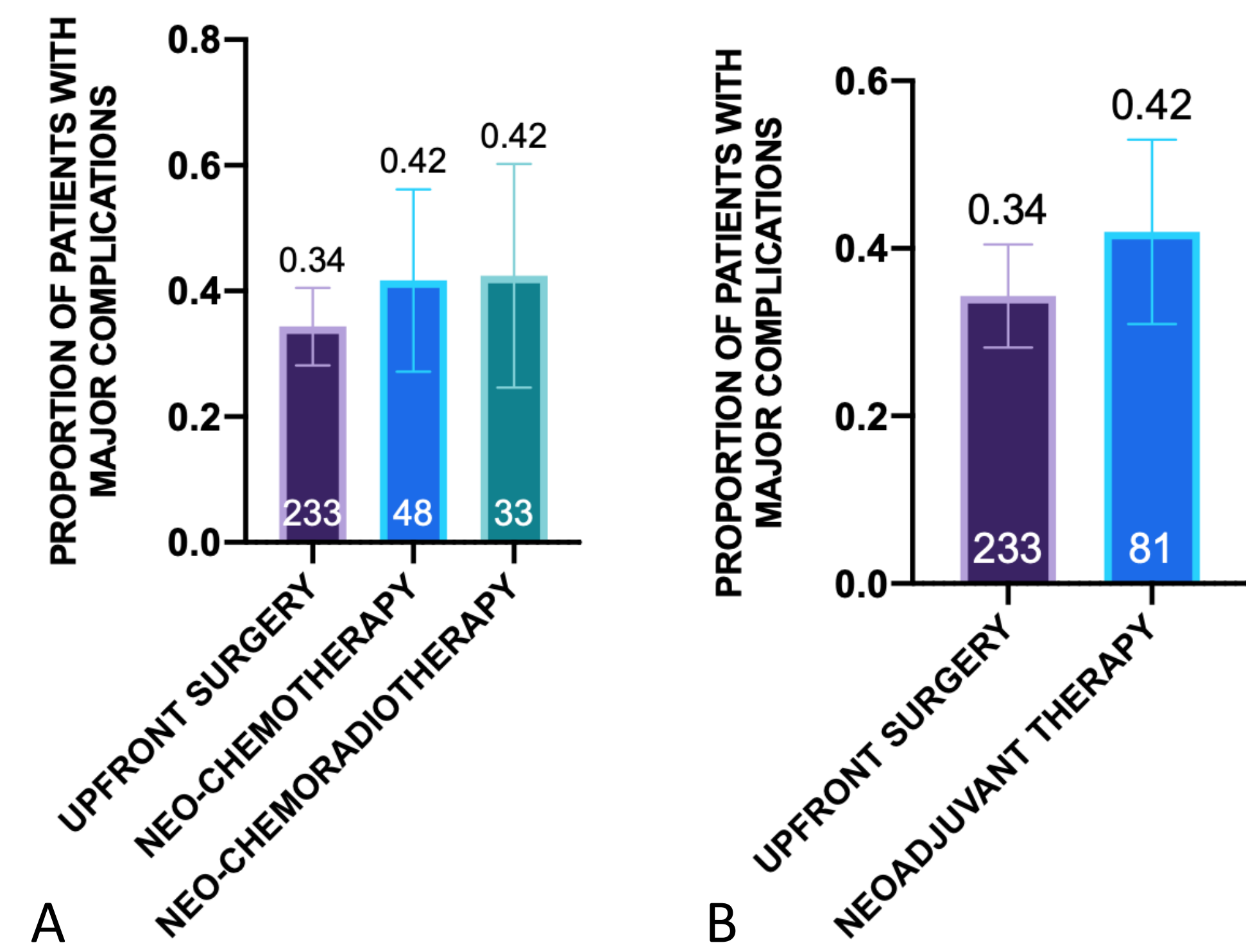


Fig 1. Comparison of rates of 30-day major surgical complications in patients who underwent neo-CHT, neo-CRT, upfront surgery (A), or either upfront surgery versus any neoadjuvant therapy (B). 95% CI is displayed as error bars, mean above error bars, and sample size within the bar. There were no significant differences between groups (A; p = 0.49, B; p = 0.24).

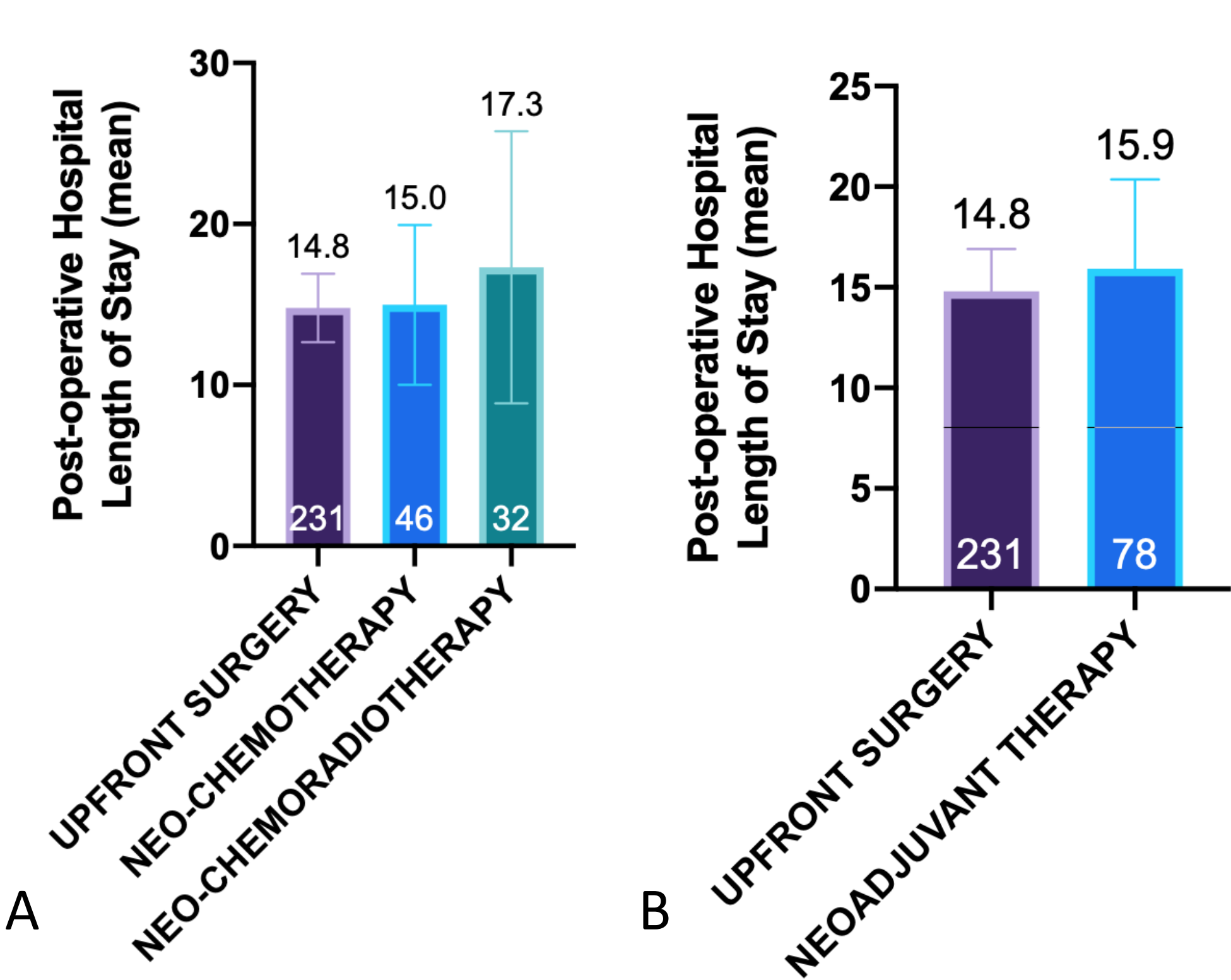


Fig 2. Hospital length of stay (LOS) between those who underwent neo-CHT, neo-CRT, versus upfront surgery (A) or those who had any neoadjuvant therapy versus upfront surgery (B). 95% CI is displayed as error bars, mean above error bars, and sample size within the bar. There were no significant differences in LOS (A; p=0.73, B; P = 0.30).

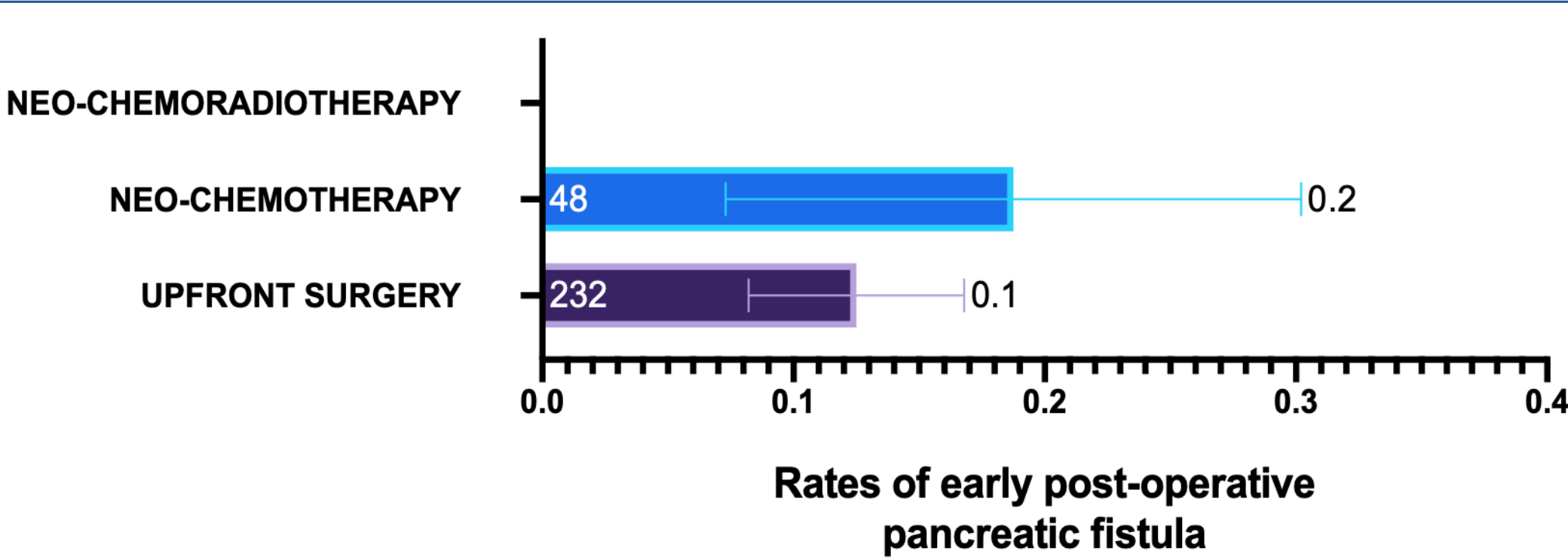


Fig 3. Comparison of 30-day pancreatic fistula rates in patients who underwent neo-CRT (0 events, n=33), neo-CHT, or upfront surgery. 95% CI is displayed as error bars, mean above error bars, and sample size within the bar. There was a statistically significant decrease in early pancreatic fistula formation in patients who underwent neo-CRT compared to those who underwent neo-CHT or upfront resection (p=0.024).

Complication Type	Upfront Surgery (n=235)	Neo-CHT (n=49)	Neo-CRT (n=33)	p
Major wound disruption	43 (18.3)	9 (18.4)	9 (26.5)	0.51
Pneumonia	12 (5.1)	5 (10.2)	1 (2.9)	0.31
PE	2 (0.85)	1 (2.0)	1 (2.9)	0.56
Ventilation > 48 hours	16 (6.8)	3 (6.1)	3 (8.8)	0.88
Acute renal failure	13 (5.5)	0 (0)	6 (17.6)	0.01
CVA	1 (0.43)	1 (2.0)	0 (0)	0.44
MI	0 (0)	0 (0)	2 (6.6)	0.01
DVT	15 (6.4)	4 (8.2)	4 (11.8)	0.52
C. difficile	4 (1.7)	4 (8.2)	0 (0)	0.036
Sepsis	45 (19.1)	7 (14.3)	1 (2.9)	0.023
Septic Shock	13 (5.5)	0 (0)	0 (0)	0.02
Death	10 (4.3)	1 (2.0)	2 (5.9)	0.65
Total	81 (34.6)	20 (41.6)	14 (42.4)	

Table 2. Number of complications (%) by group.

## SUMMARY / CONCLUSION

- Neoadjuvant chemotherapy or radiation in potentially resectable pancreatic cancer patients does not appear to increase overall 30-day perioperative complication rates.
- Query whether small numbers of events resulted in significant differences in rates of MI, acute renal failure/insufficiency, and C. difficile infection.
- As there was a significant decrease in early pancreatic fistula and sepsis rates in patients who received neo-CRT compared to those who didn't, neo-CRT may be protective against these complications.
- 60 and 90 day post-operative outcomes are actively being evaluated.

## ACKNOWLEDGEMENTS

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