

# Surgical Outcomes in Pancreatic Cancer: Implications for Perioperative Risk Stratification

## Background

- Pancreatic ductal adenocarcinoma (PDAC) is the 3<sup>rd</sup> leading cause of cancer related mortality in the U.S., with a 5-year survival rate.
- Nutritional and inflammatory status, in addition to social demographics, have emerged as potential predictors of postoperative outcomes in patients undergoing pancreatic resection.
- The relationship between preoperative Prognostic Nutritional Index (PNI), Area Deprivation Index (ADI), and circulating tumor DNA (ctDNA) and postoperative length of stay (LOS) following pancreatic resection remains incompletely characterized.

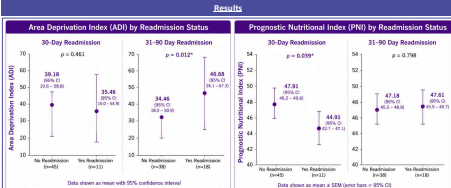
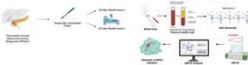
## Research Objectives

- This analysis aims to determine whether ADI, PNI, and ctDNA are associated with perioperative outcomes, including postoperative readmission and LOS.

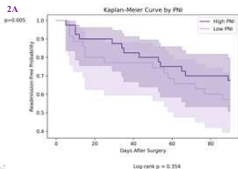
## Methods

- Cohort of 76 patients with localized PDAC undergoing pancreatic resection following enrollment in a prospective phase II trial (NCT04616131).
- Readmission was defined as hospital encounters occurring within 30 days (30-day readmission) or 31-90 days (90-day readmission) following hospital discharge.
- PNI/ADI vs. Readmission: Chi-square tests and independent samples t-tests
- PNI vs. Length of Stay (LOS): Pearson correlation analysis
- Time-to-readmission within 90 days was evaluated using multivariable Cox proportional hazards regression including PNI, ADI, and LOS covariates. Patients without readmission were censored at 90 days.
- PNI = (10 × albumin [g/dL]) + (0.005 × lymphocyte count [mm<sup>3</sup>])
- ADI categorized into tertiles: Low / Medium / High

### ctDNA Timepoint Workflow



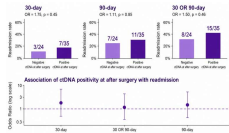
**Figure 1.** Association of Area Deprivation Index (ADI) and Prognostic Nutritional Index (PNI) with postoperative readmission and length of stay (LOS). Mean ADI and PNI values were compared between patients with and without postoperative readmission at 30 days and 31-90 days following surgery. ADI was not associated with 30-day readmission ( $p = 0.461$ ), but was significantly higher among patients readmitted between 31-90 days ( $p = 0.012$ ). Lower PNI was significantly associated with 30-day readmission ( $p = 0.039$ ), but not with delayed readmission ( $p = 0.798$ ).



**Figure 2.** Predictors of postoperative readmission following pancreatic resection.

(A) Multivariable Cox proportional hazards model evaluating PNI, ADI, and LOS. (B) Kaplan-Meier readmission-free survival curves stratified by PNI. Increased length of stay (LOS) was independently associated with greater readmission hazard, while PNI and ADI were not significant in the adjusted model.

## Results



**Figure 3.** Association of ctDNA positivity at/after surgical resection with postoperative readmission. Readmission rates at 30 days, 90 days, and combined 30- or 90-day intervals are shown by ctDNA status at/after surgery. Odds ratios with 95% confidence intervals are displayed below. ctDNA-positive patients demonstrated higher readmission rates, although associations were not statistically significant.

## Conclusions

- Lower PNI was associated with increased 30-day readmission.
- Higher ADI was associated with increased 31-90 day readmission.
- These findings suggest that biologic and socioeconomic factors may influence postoperative outcomes following pancreatic resection.
- In contrast, tumor-derived biomarkers and intraoperative factors were not associated with readmission in this cohort.
- Further investigation in larger cohorts is warranted to evaluate the role of combined molecular, nutritional, and socioeconomic risk stratification models.

## Limitations

- Limited cohort size (76)
- Limited access to data: data collection from patients that underwent surgical resection only at Central DuPage Hospital.

## Acknowledgements

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Trial Information: NCT04616131