

# CA19-9 Response Pattern during Neoadjuvant Radiation in Pancreatic Cancer Predicts Outcomes

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## BACKGROUND AND AIMS

### Multimodality Neoadjuvant Therapy for Localized Pancreatic Cancer (PC)



Transition from chemotherapy (systemic) to radiotherapy (local)

- CA19-9 trend may have utility in identifying distant disease in the absence of any radiologic or other indication of metastasis

CA19-9 is the most important biomarker for PC<sup>1</sup>

- Normalization of CA19-9 during neoadjuvant treatment is associated with dramatically improved survival<sup>2</sup>
- Less than 40% of patients achieve normalization

### Our Hypothesis

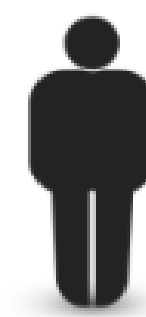
Patients (pts) with distant occult metastasis who respond to initial chemotherapy may have disease progression (as measured by a stable or rising CA19-9 levels) during radiotherapy due to the absence of systemic treatment

### Aims

- Characterize the consequences of various CA19-9 response patterns during radiotherapy on:
  - Metastatic disease progression during neoadjuvant therapy
  - Rates of treatment completion (including surgery)
  - Survival

## METHODS

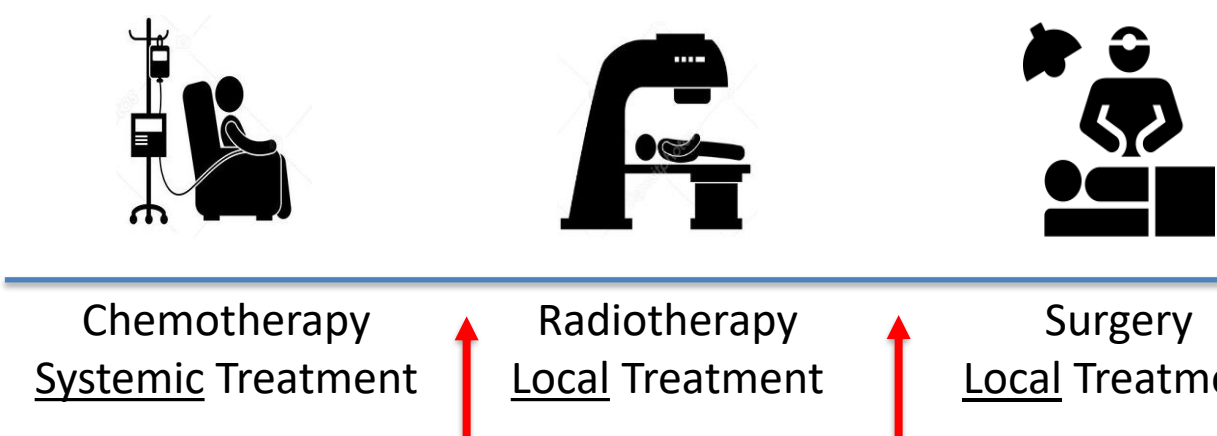
### Inclusion Criteria:



- Borderline Resectable PC
- CA19-9 producer (elevated CA19-9 at diagnosis with total bilirubin <2.0 mg/dL)
- Diagnosis and treatment 2009 – 2020
- 2-4 months of neoadjuvant chemotherapy followed by radiotherapy

### CA19-9 Classification

- Normal vs elevated (35 U/mL with total bilirubin <2.0 mg/dL)
- Compared values pre- and post- radiation



### Proportional Change in CA19-9

- Before and after radiotherapy

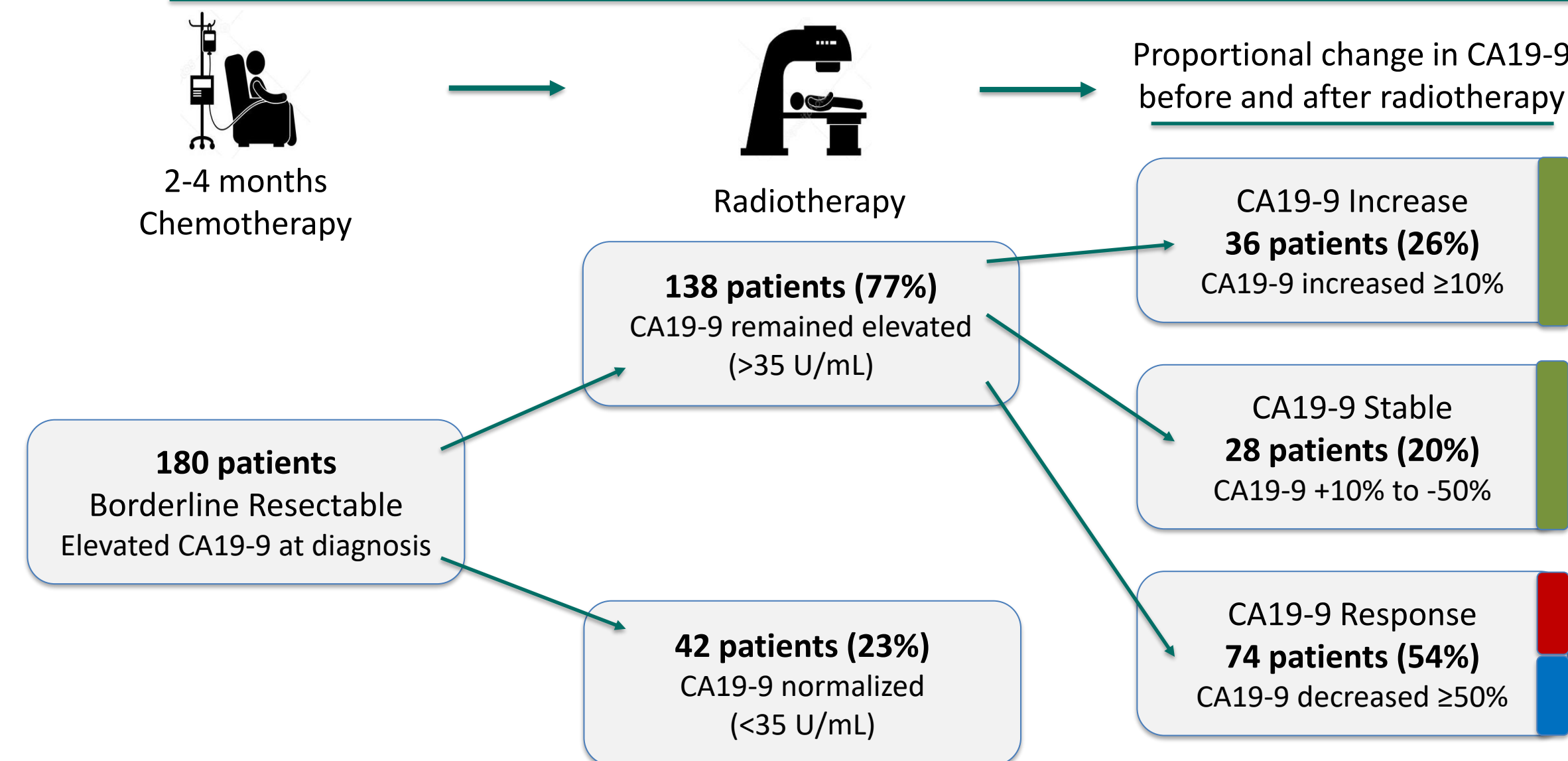
Table 1: Proportional change in CA19-9

Classification	Change in CA19-9
Response	≥ 50% decrease
Stable	< 50% decrease & < 10% increase
Increase	≥ 10% increase

### Statistical Analysis

- X<sup>2</sup> test for dichotomous outcomes
- Kaplan Meier method with log-rank test for median overall survival

## RESULTS



### Restratification of patient groups:

- Combined Stable and Rise group (no differences in above analysis)
- Response, but with persistently elevated CA19-9
- Response, with normalization of CA19-9

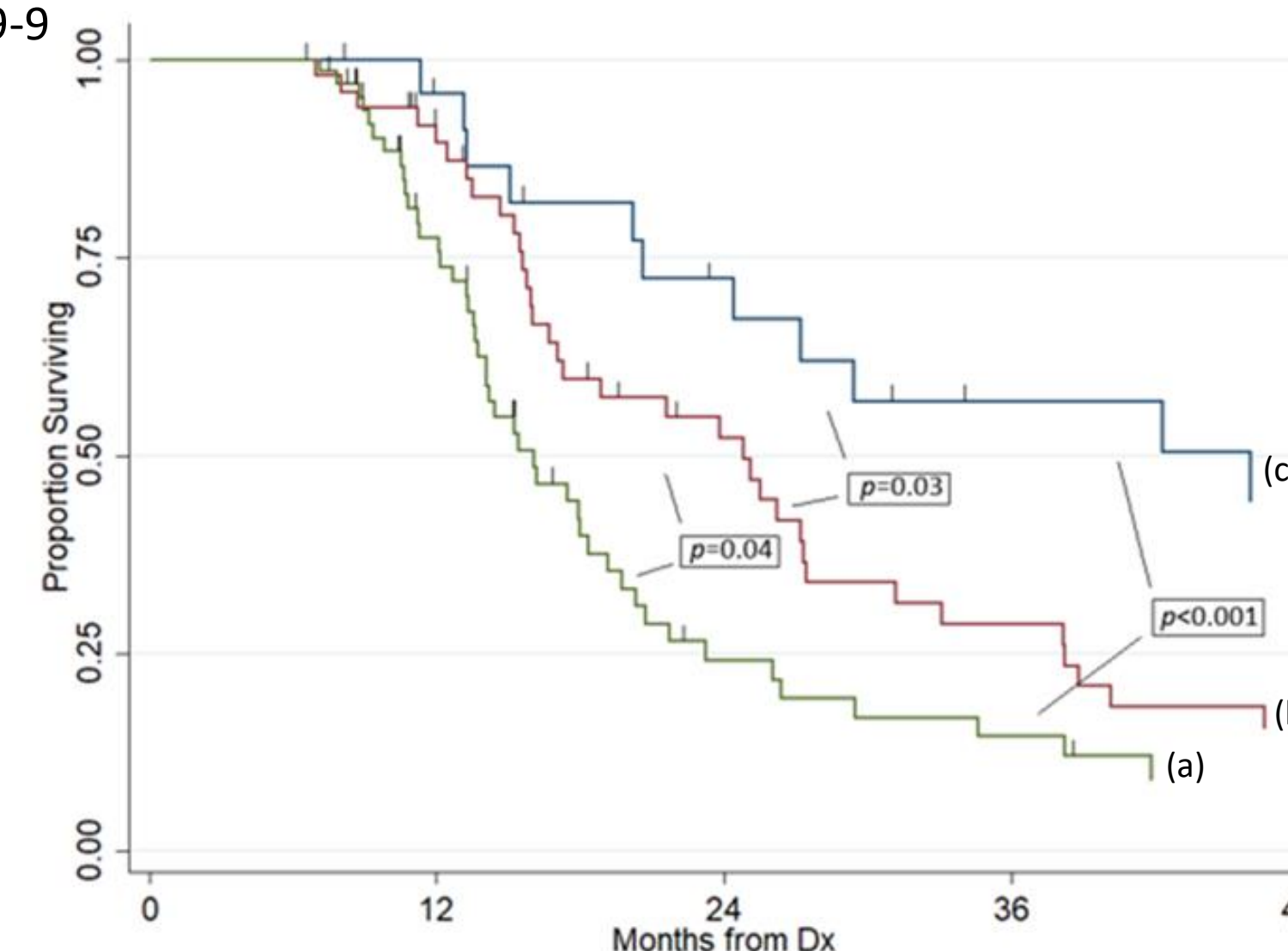
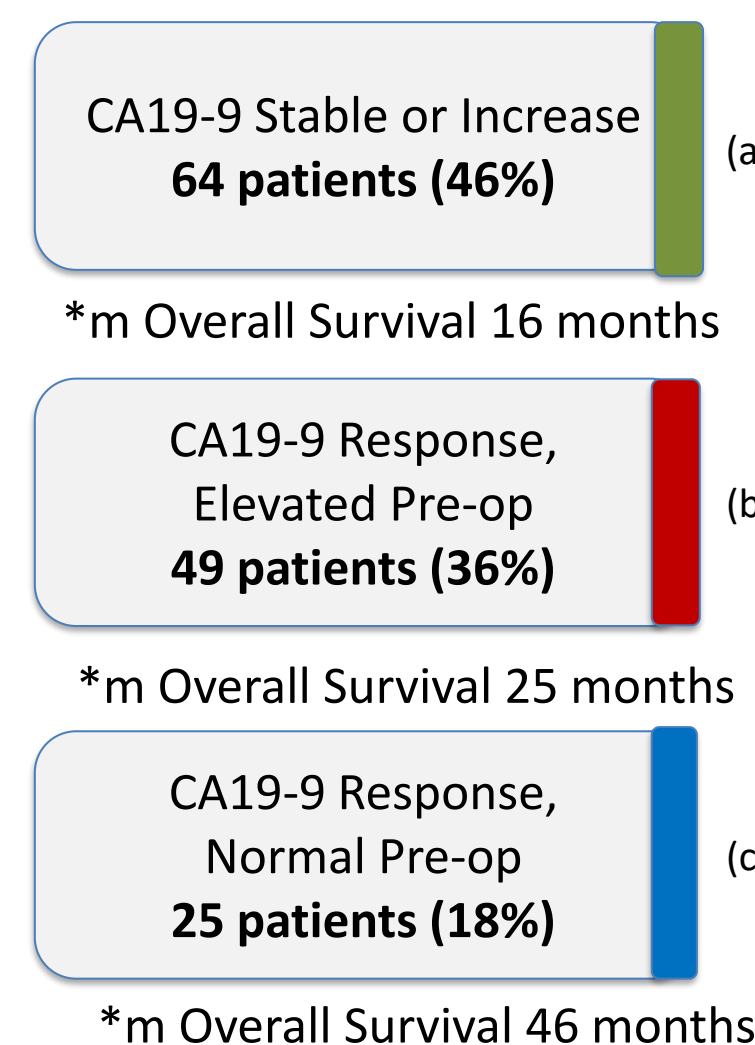


Table 2: Outcomes by CA19-9 trend during Radiotherapy

	Response	Stable	Increase	P-value
Metastatic progression	11/74 (15%)	10/28 (35%)	11/36 (31%)	0.04
Surgical resection	59/74 (79%)	16/28 (57%)	19/36 (53%)	0.01
Overall Survival	27 mo	16 mo	15 mo	0.001

## SUMMARY AND CONCLUSIONS

Normalization of CA19-9 following radiotherapy is the most important prognostic factor and was associated with a median overall survival of 46 months

- Consistent with prior studies of similarly treated pts
- Suggests local and micrometastatic disease is controlled

Outcomes among pts with less than a 50% reduction in CA19-9 were no different than pts who had an increasing CA19-9 during neoadjuvant radiotherapy

- These pts have a high probability of occult metastasis
- Modest declines (<50%) in CA19-9 are not oncologically significant

Outcomes among pts with greater than a 50% reduction in CA19-9 without normalization had a significantly improved survival over patients with stable or increasing CA19-9 levels

CA19-9 trends during neoadjuvant treatment may guide therapeutic decisions and characterize tumor biology

- Help determine which pts would benefit from definitive local therapy (surgery) versus continued systemic treatment



knowledge changing life

1. Boone BA, Steve J, Zenati MS, Hogg ME, Singhi AD, Bartlett DL, Zureikat AH, Bahary N, Zeh HJ 3rd. Serum CA 19-9 response to neoadjuvant therapy is associated with outcome in pancreatic adenocarcinoma. Ann Surg Oncol. 2014 Dec;21(13):4351-8.
2. Tsai S, George B, Wittmann D, Ritch PS, Krepline AN, Aldakkak M, Barnes CA, Christians KK, Dua K, Griffin M, Hagen C, Hall WA, Erickson BA, Evans DB. Importance of Normalization of CA19-9 Levels Following Neoadjuvant Therapy in Patients With Localized Pancreatic Cancer. Ann Surg. 2020 Apr;271(4):740-747.



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