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# Trends and Outcomes for Patients Receiving Neoadjuvant Therapy for Stage I-III Gastric Gastrointestinal Stromal Tumors

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## Background

- Neoadjuvant therapy is not well characterized for localized gastric gastrointestinal stromal tumors (GISTs). Its impact on surgical outcomes and survival remains controversial.
- Trends and outcomes of neoadjuvant therapy in this setting need clarification.
- **This study compares patient characteristics and outcomes between those who received neoadjuvant therapy and those who underwent up-front resection.**

## Objectives

The primary objective of this study was to determine differences in surgical outcomes and tumor characteristics for patients with localized, gastric GISTs receiving either neoadjuvant therapy (NAT) or up-front surgery (UFS).

The second objective was to elucidate the utilization and tumor characteristic trends we are seeing for these patients

## Methods

We retrospectively analyzed the NCDB from 2004-2020. Patients were included if they received curative-intent resection for localized (clinical staging I-III), gastric GISTs. Patients were excluded if they received palliative treatment. Patients were classified by whether they received neoadjuvant therapy (NAT) or up-front surgery (UFS).

Once selected, NAT and UFS utilization trends were determined. Further, patient demographics and tumor characteristics were gathered and compared via univariate testing. For survival analysis, patients were propensity-score matched 3:1 for UFS and NAT patients, respectively. Cox Proportional Hazards models and Kaplan-Meier Curves were built to assess for overall survival.

| Variable | NAT | UFS | P-Value |
|---|---|---|---|
| **Number of Patients (%)** | 1504 (8.1) | 17150 (91.9) | |
| **Age** | | | <0.001 |
| Mean (SD) | 62.75 (12.18) | 64.66 (12.56) | |
| **Sex** | | | 0.049 |
| Male (%) | 754 (50.1) | 8138 (47.5) | |
| **Race (%)** | | | <0.001 |
| Asian | 114 ( 7.7) | 825 ( 4.9) | |
| Black | 425 (28.6) | 4112 (24.2) | |
| Native American | 2 ( 0.1) | 35 ( 0.2) | |
| Other | 20 ( 1.3) | 193 ( 1.1) | |
| Pacific Islander | 17 ( 1.1) | 57 ( 0.3) | |
| White | 906 (61.1) | 11778 (69.3) | |
| **Insurance Status (%)** | | | <0.001 |
| Medicaid | 120 ( 8.1) | 942 ( 5.6) | |
| Medicare | 653 (44.0) | 8479 (50.2) | |
| Not Insured | 41 ( 2.8) | 498 ( 2.9) | |
| Other Government | 22 ( 1.5) | 206 ( 1.2) | |
| Private Insurance | 648 (43.7) | 6762 (40.0) | |
| **Tumor Size (cm)** | | | <0.001 |
| Mean (SD) | 12.0 (11.0) | 6.4 (8.5) | |
| **Node Status** | | | |
| Positive (%) | 911 (61.6) | 13307 (78.9) | <0.001 |
| **Stage** | | | <0.001 |
| 1 | 500 (42.3) | 9823 (71.7) | |
| 2 | 305 (25.8) | 1834 (13.4) | |
| 3 | 250 (21.2) | 1763 (12.9) | |
| **Multivisceral Status** | | | <0.001 |
| Not Multivisceral | 1292 (85.9) | 16434 (95.8) | |
| **Charleson-Deyo Comorbidity Score** | | | <0.001 |
| 0 | 1129 (75.1) | 11951 (69.7) | |
| 1 | 262 (17.4) | 3579 (20.9) | |
| 2 | 69 ( 4.6) | 1056 ( 6.2) | |
| 3+ | 44 ( 2.9) | 564 ( 3.3) | |

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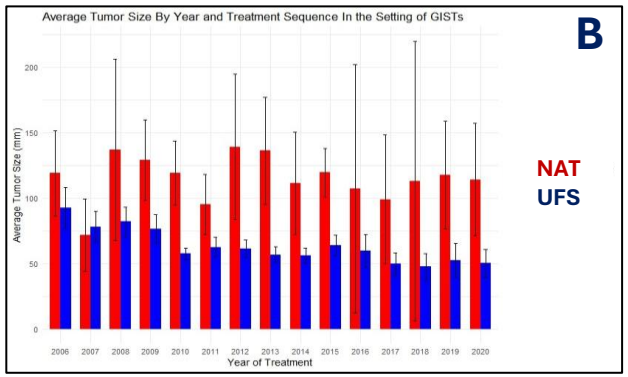
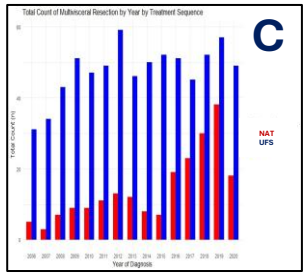
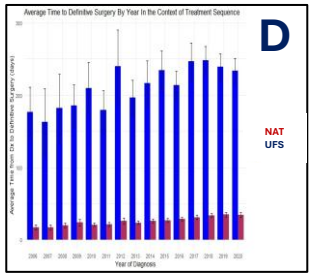
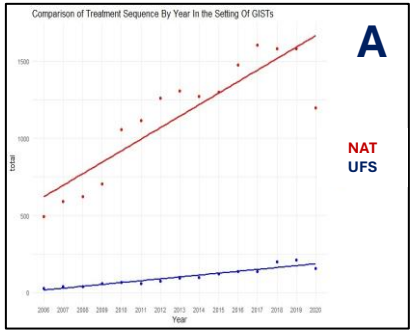
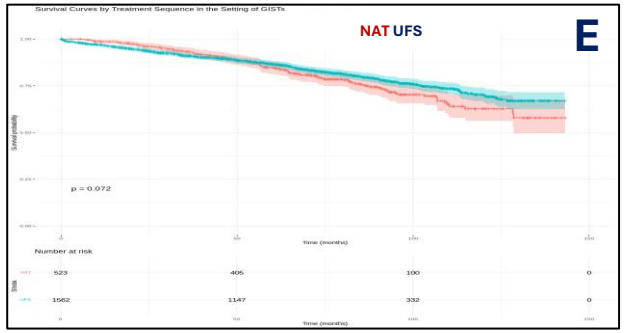
## Results




## Figure Legend

1.) Tumor Characteristics and Demographics table for the two cohorts. The NAT cohort has greater tumor size, lower pathologic node status, worse clinical staging, and more multivisceral resections

A.) UFS utilization is increasing by 62 cases/year ($p<0.05$), while NAT is increasing by 12 cases/year ($p<0.05$)

B.) Average tumor size for NAT is larger (reference Table 1), but it has not changed from 2004-2020. However, tumor size for UFS has decreased by about -2.6mm/year ($p<0.05$).

C.) In total, NAT does a larger proportion of multivisceral resections (ref. Table 1) and is increasing by 1.74 cases/yr ($p<0.05$). UFS is not changing ($p=0.19$).

D.) NAT utilization is increasing by 5.5 days/year ($p<0.05$), and 1.3 days per year for UFS ($p<0.05$).

E.) Overall Survival Analysis with CoxPH models reveals no difference in survival (UFS: HR = 0.86, 95%CI = 0.76-1.01, p = 0.07)

## Limitations

- Retrospective analysis suggests measurement and selection bias
- Unable to examine other prognostic data, including molecular markers
- May be missing certain variables that are crucial to survival analysis but had to be selective due to overfitting

## Conclusions

•Neoadjuvant therapy (NAT) is used less frequently than up-front surgery (UFS) overall.

•Patient demographics, tumor characteristics, and trends suggest NAT is being used to improve surgical resectability, aligning with existing literature.

•After adjusting for covariates, there is no significant difference in survival between patients who received UFS and those who received NAT. This may indicate that NAT is not being applied to the right patients or prognostic groups.

## References

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