

# Association Between Quitting Smoking and Survival in Cancer Patients

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## Background

- According to the 2014 Surgeon General's report, there is sufficient evidence that continued smoking following a cancer diagnosis is associated with a number of adverse health outcomes, including increased poorer survival from all-causes and cancer-related causes.
- However, more research is needed to evaluate the relationship between smoking cessation, following a specific cancer diagnosis, and survival.
- The current study explored the association between smoking abstinence and survival in a large sample of cancer patients who received tobacco cessation treatment in the University of Texas MD Anderson Cancer Center (UTMDACC) Tobacco Treatment Program (TTP).

## Hypothesis

Cancer patients who quit smoking would have better survival outcomes compared to those who do not quit, and this effect will vary by cancer diagnosis.

## Methodology

- To examine associations between smoking abstinence status and survivorship we used bivariate comparisons employing t-test for continued variables and chi-square for categorical variables
- Survival analysis examined the effects of abstinence on survival controlling for individual level characteristics.
- We also tested for an interaction effect between abstinence status in cancer diagnosis on survival.

## Results

### Individual Characteristics of Abstinence and Non-Abstinence

Variables	Non-abstinence (n=2,992)	Abstinence (n=1,924)	p-value
Positive Affect	Mean (SD) 30.08 (8.10)	Mean (SD) 31.05 (8.16)	< 0.001
Negative Affect	20.51(8.36)	20.37(8.01)	.64
Years Smoked	35.26(13.36)	33.60 (13.76)	.34
Age	53.14 (11.47)	53.47 (11.61)	.66
Depression	.36(.56)	.31 (.54)	< 0.001
Anxiety	.20(.40)	.16 (.37)	< 0.001
Female	<b>51.14(1,598)</b>	<b>49.15(988)</b>	<b>0.166</b>
Male	48.86(1,527)	50.85(1,022)	
Cancer Site	%(n)	%(n)	<b>0.003</b>
Lung	16.26(510)	13.57(274)	
Breast	14.89(467)	17.68(357)	
Genitourinary	17.70(555)	16.79(339)	
Head & Neck	14.76(463)	17.88(361)	
Hematologic	8.26(259)	7.73(156)	
Skin	8.42(264)	8.02(162)	
Abdominal	11.19(351)	10.25(207)	
Other	8.51(267)	8.07(163)	

### References

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### Hazard ratio results for the multi-variable cox PH model

	Hazard Ratio	95% Confidence Intervals	p-value
<b>Abstinence</b>	0.65	0.58 0.72	< .001
<b>Cancer Diagnosis</b>			
Breast	0.28	0.22 0.34	< .001
Genitourinary	0.31	0.26 0.37	< .001
Head & Neck	0.35	-12.06 0.00	< .001
Hematologic	0.54	0.44 0.66	< .001
Skin	0.30	0.23 0.39	< .001
Abdominal	0.60	0.51 0.72	< .001
Other	0.60	0.49 0.73	< .001
Age	1.01	1.01 1.02	< .001
Sex	1.32	1.17 1.48	< .001
Depression	1.07	0.97 1.18	0.17
Anxiety	1.01	0.88 1.16	0.88
Positive Affect	0.99	0.99 1.00	0.04
Negative Affect	1.00	1.00 1.01	0.37
FTND (Nicotine Dependence)	1.02	1.00 1.05	0.07
Time from Diagnosis	1.00	1.00 1.00	0
Years Smoked	1.00	1.00 1.01	0.11

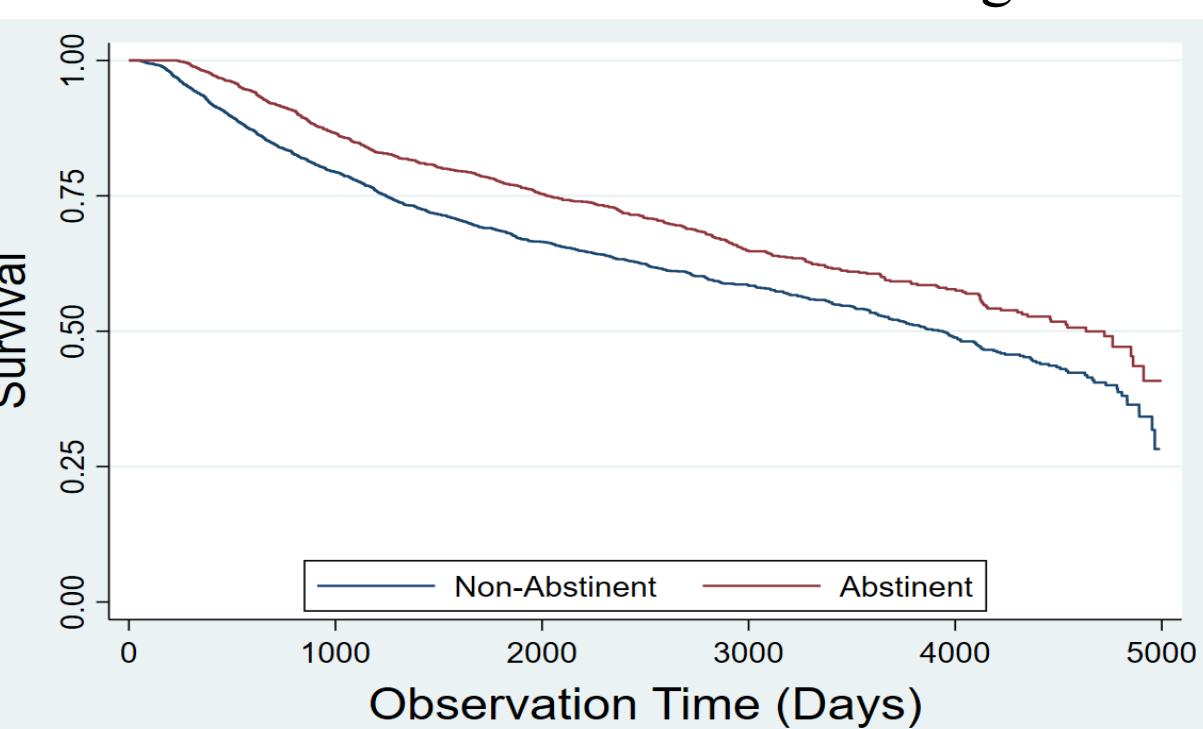
## Conclusions and Discussion

- Overall the results confirm the hypothesis quitting smoking is associated with increased survival in survival for cancer patients.
- Moreover, the benefits in survival are not homogeneous across cancer diagnosis groups.
- Patients with specific cancer diagnoses, such as lung and abdominal cancer, may benefit most from quitting.
- Treating cancer patients who smoke with comprehensive tobacco cessation interventions will contribute in increasing cessation rates and overall survival, especially for patients with lung, hematologic, and abdominal cancer diagnosis.

## Acknowledgements

This work was supported by NIH/NCI R25CA056452, Taylor Simmons, and by the NIH/NCI under award number P30 CA016672

Thank you so much Dr. Janice Blalock, Dr. George Kypriotakis, and Mark Evans for your mentorship this summer.



- We performed survival analysis on N = 4,356 patients using the Cox proportional hazards model controlling for cancer diagnosis, age, sex, depression, anxiety, positive and negative affect, nicotine dependence and years smoked, and time from diagnosis to TTP participation.
- Abstainers from smoking had a significant lower hazard of dying as compared to those who did not abstain (HR = 0.65; p < 0.001).
- The interaction of cancer diagnosis with abstinence status was also significant.
- Specifically, the effect of abstinence on survival was significant among the following:
  - Lung cancer (HR= 0.51; p < 0.001)
  - Breast cancer (HR = 0.74; p = 0.040)
  - Hematologic cancer (HR = 0.68; p = 0.036)
  - Abdominal cancer (HR = 0.44; p = 0.002).
- For genitourinary, head & neck, skin, and other cancer diagnoses, quitting smoking did not have a significant effect on survival.