# Clinical Outcomes of Locally Advanced Lung Cancer Patients Treated with 60 Gy vs. 70 Gy

OAKLAND UNIVERSITY WILLIAM BEAUMONT

**Batoul Nasser M.S.[1], Muayad F Almahariq M.D./Ph.D.[2], Inga Grills M.D.[2]**

1.Oakland University William Beaumont School of Medicine
2.Beaumont Health – Department of Radiation Oncology

## Introduction

The standard form of treatment for locally advanced lung cancer is to prescribe the conventional dose of 60 Gy radiation therapy (RT) concurrently with chemotherapy. However, five-year overall survival in still less than 20%. These outcomes remain poor due to both distant and local regional recurrence. The literature suggests that local regional control and overall survival is strongly associated with doses of radiotherapy that are higher than 60 Gy. However, when escalating radiation dose was prescribed exceeding 70 Gy, the overall survival rates plateaued. The primary goal of this study is to determine if there is a marked difference in clinical outcomes (i.e., mortality, disease progression, local recurrence) when administering varying RT doses – standard 60 Gy vs. simulated integrated boost (SIB) to 70 Gy – in concordance with chemotherapy, to patients with locally advanced lung cancer. A secondary goal is to determine if our findings support of contradict the results of previous studies that examined escalating doses of radiotherapy.

## Aims and Objectives

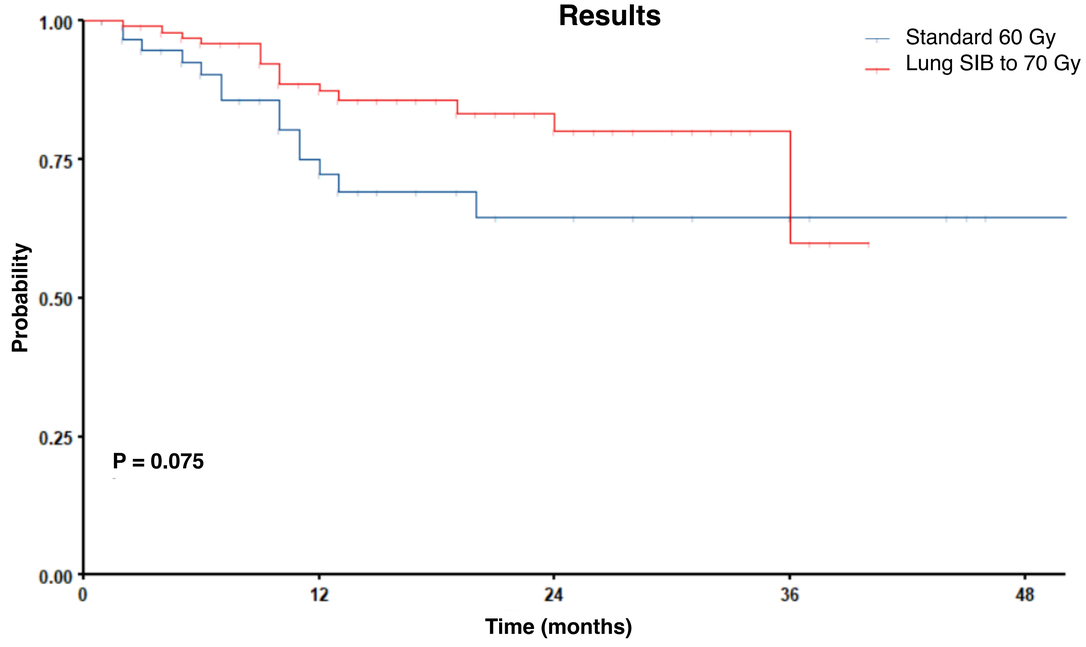
Aim I: Identify and compare the clinical outcomes (i.e. mortality, disease progression, local recurrence) of patients with locally advanced lung cancer treated with either 60 Gy or 70 Gy concurrently with traditional chemotherapy.

Aim II: Assess whether or not our findings support or contradict the results of the previous studies that examined whether escalating doses of radiotherapy improved the local regional control as well as overall survival of the patients.

## Methods

- This was a retrospective cohort review of 165 patients with localized lung cancer from Beaumont hospitals between 2009 to 2019
- Patients were de-identified and were analyzed as either receiving standard 60 Gy or lung SIB to 70 Gy treated concomitantly with chemotherapy.
- Following patients' data was collected and evaluated: performance status, radiation dose, clinical outcomes of overall survival, local regional control, progression-free survival, status, and history of heart disease, hypertension, kidney disease, and diabetes.

## Results




Graph 1: Kaplan Meier estimates of local recurrence in patients with locally advanced lung cancer

- Univariate and doubly robust multivariable Cox regression analysis of local recurrence demonstrated slightly improved local control in patients receiving lung SIB to 70 Gy compared to patients receiving conventional 60 Gy, p=0.057.

## Conclusions

- Lung SIB to 70 Gy demonstrated a trend of improved local control compared to conventional 60 Gy.
- Lung SIB to 70 Gy is s safe approach to deliver higher doses of radiation therapy to gross tumor while sparing normal tissue.

## Limitations

- Limited follow-up time; median 18 months
- A significantly higher percentage of patients receiving lung SIB to 70 Gy were also receiving immunotherapy
  - While this does not significantly affect local control, it does affect overall survival outcomes and distant metastasis
- Much smaller number of patients receiving conventional 60 Gy compared to patients getting lung SIB to 70 Gy
  - May require additional patients from outside institutions

## References

1. Ma, L., Men, Y., Feng, L., Kang, J., Sun, X., Yuan, M., Jiang, W., & Hui, Z. (2019). A current review of dose-escalated radiotherapy in locally advanced non-small cell lung cancer. In Radiology and Oncology (Vol. 53, Issue 1, pp. 6–14). Sciendo. https://doi.org/10.2478/raon-2019-0006
2. Radiation Therapy for Lung Cancer | American Lung Association. (n.d.). Retrieved February 3, 2020, from https://www.lung.org/lung-health-and-diseases/lung-disease-lookup/lung-cancer/patients/treatment/types-of-treatment/radiation-therapy.html
3. Radiation Therapy for Non-Small Cell Lung Cancer. (n.d.). Retrieved February 3, 2020, from https://www.cancer.org/cancer/lung-cancer/treating-non-small-cell/radiation-therapy.html
4. de Groot PM, Wu CC, Carter BW, Munden RF. The epidemiology of lung cancer. Transl Lung Cancer Res 2018;7(3):220-233. doi: 10.21037/tlcr.2018.05.06
5. Ellis, P. M., & Vandermeer, R. (2011). Delays in the diagnosis of lung cancer. https://doi.org/10.3978/j.issn.2072-1439.2011.01.01