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## Redefining treatment interval in lung cancer surgery in the era of prehabilitation: A systematic review

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**Background:** Time-to-surgery is used as a quality indicator within lung cancer care. Current maximum allowed time frames in the Dutch guideline prove to act as a barrier for implementation of preoperative patient optimization such as prehabilitation.

**Objective:** This study aimed to explore the definition of treatment interval until lung cancer surgery, and examine the relation between its duration and oncological outcomes.

**Methods:** A systematic search was performed in January 2025 through MEDLINE, EMBASE and Cochrane databases. Papers about lung cancer patients with time-to-surgery description were included. Oncological outcomes related to this treatment interval were reported.

**Results:** 86 included papers reported a definition of time-to-surgery. Starting points to define the interval varied widely, of which diagnosis was reported most often. 36 papers reported associations of time-to-surgery with oncological outcomes, of which overall survival was reported most often. Almost half of the papers reported an association of a longer interval with worse outcomes and the rest reported no association or variable outcome dependent on tumor stage. A 6-week timeframe was commonly considered timely, but definitions ranged from 21 to 90 days, limiting comparability.

**Conclusion:** Within lung cancer care, no clear defined treatment interval until surgery is available. We suggest using pathological diagnosis as a starting point and a 6-week timeframe as a basis to define timely surgery instead of as soon as possible, without significantly compromising oncological safety. Defining an interval can reframe waiting time into structural preoperative preparation time, unlocking the opportunity to implement prehabilitation and optimize patient outcomes.

### Keywords

lung cancer, surgery, treatment interval, survival

### Conflict of Interest & Ethical Approval

yes

### Abstract submitters declaration

yes

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