Multidimensional Analysis and Future Perspectives of Surrogate Decision-making for Lung Cancer Patients

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Abstract: Lung cancer, being common and highly mortal, requires attention to its associated cognitive issues during diagnosis and treatment. Many patients have executive dysfunction that exacerbates with disease progression, and numerous advanced-stage patients struggle to clarify end-of-life treatment preferences due to multiple factors. Surrogate decision-making mechanisms can relieve related stress and conflicts, yet research in the lung cancer field is insufficient. This paper systematically integrates research on surrogate decision-making for lung cancer patients, analyzes the decision-making system, compares different paradigms, describes the development of support systems, and anticipates the future from aspects like dynamic decision ecosystems, technology — enabled care, ethical safeguards, and proxy care, providing theoretical guidance for clinical practice.

Keywords**:** Surrogate decision-making; Lung cancer patients; Strategy enhancement; Decision-aiding

1. Introduction

Lung cancer, as one of the most prevalent malignancies worldwide and a leading cause of cancer-related mortality, demands heightened attention to its associated cognitive impairments during diagnosis and treatment. Current evidence demonstrates that approximately 45% of patients exhibit executive dysfunction, with stepwise deterioration observed as the disease progresses. Among advanced-stage patients, 65%—85% fail to articulate end-of-life treatment preferences due to communication barriers, loss of decision-making capacity, and inadequate social support. Surrogate decision-making mechanisms, serving as value transmission pathways, can alleviate decision-related stressors and ethical conflicts. However, research on surrogate decision-making in lung cancer remains underdeveloped within respiratory oncology. This review systematically synthesizes current findings on surrogate decision-making for lung cancer patients to provide theoretical guidance for clinical practice[1].

2. Analysis of Proxy Decision-Making Systems

2.1 Conceptual Reconfiguration

Proxy decision-making refers to a legally sanctioned process wherein authorized representatives exercise medical decision-making rights on behalf of individuals incapacitated by conditions such as cognitive decline or consciousness disorders. This system is widely implemented in judicial authentication, hospice care, and other scenarios requiring substitute judgment. Surrogates are ethically obligated to evaluate risk-benefit ratios in complex medical situations based on the principal's historical behavioral patterns and value priorities[2].

2.2 Surrogate Designation Mechanisms

The selection of proxies prioritizes statutory principles, with advance medical directives holding supreme legal validity. In the absence of formal documentation, blood relationships serve as the primary criterion, where spouses and direct descendants are hierarchically prioritized according to inheritance laws. Exceptions permit notarized predetermined guardianship arrangements to transcend kinship boundaries; however, complex judicial confirmation processes limit their practical application. Surrogate designation systems must balance legal rigor and humanistic considerations while establishing multidimensional authorization frameworks[3].

2.3 Historical Evolution of Medical Authority

Integrated Section Medical decision-making authority has evolved through four paradigm shifts, transitioning from physician-dominated models to collaborative governance systems. Initially, the Traditional Authority Model centralized power within medical teams, where unilateral formulation and execution of treatment plans prevailed without patient input.

This shifted under the Reformed Authority Model, wherein healthcare providers began acknowledging patient values while retaining ultimate decisional control. Subsequent emphasis on transparency during the Information Transparency Phase prioritized patients' right to know, though inadvertently increasing risks of decision paralysis due to informational overload[4]. The contemporary Collaborative Governance System establishes dialogic platforms integrating clinical expertise with individual life values, explicitly recognizing surrogate decision-making as an institutional safeguard. This specialized mechanism ensures decision continuity for patients with consciousness impairment or terminal illness through legally authorized proxy participation, bridging gaps in autonomous choice[5].

3. Comparative Analysis of Proxy Decision-Making Paradigms

Proxy decision-making encompasses four paradigms: presumed directive implementation, living wills, the maximized benefit principle, and advance care planning (ACP). Presumed directive implementation requires surrogates to deduce hypothetical patient choices based on personal autonomy principles, yet struggles with speculative accuracy. Living wills codify treatment preferences in advance but exhibit limitations in addressing evolving clinical contexts[6]. Emerging paradigms prioritize dynamic adjustments; the maximized benefit principle evaluates interventions through a holistic lens of physiological, psychological, and social impacts, while ACP establishes collaborative dialogue to create flexible decision frameworks, enhancing end-of-life care quality. These paradigms operate synergistically: the collaborative SDM framework allows surrogates and clinicians to weigh evidence-based recommendations against patient values, granting surrogates rights to information curation, option veto, and consensus-building to ensure ethically sound decisions[7].

4. Development of Proxy Support Systems

4.1 Intelligent Decision Support Tools

Digital platforms integrate multimodal medical data to visualize treatment-specific risk-benefit matrices. Advanced systems for terminal lung cancer incorporate modules for disease trajectory simulation, survival prediction, and quality-of-life assessment, improving decision precision. Immersive virtual reality (VR) interfaces simulate long-term outcomes of palliative interventions, enhancing surrogate comprehension of complex trade-offs[8].

4.2 Dynamic Care Planning

Advance care planning transcends static advance directives through periodic clinician-family dialogues, dynamically recalibrating treatment preferences in response to disease progression. This approach reduces nonessential medical expenditures by 30% while preserving patient dignity, as demonstrated in multicenter trials. Culturally tailored strategies — such as narrative medicine techniques — reframe societal perceptions of mortality, significantly improving participation rates in conservative communities[9].

4.3 Multidisciplinary Support Conferences

Structured family conferences employ modular formats combining medical briefings, psychosocial support, and resource coordination. Innovative integration of decision-tree algorithms incorporates variables like surrogate health literacy and socioeconomic status into predictive models. Proxy support systems further mitigate decision fatigue through coaching programs that address emotional and cognitive burdens[10].

5. Future Directions and Innovations

5.1 Dynamic Proxy Decision Ecosystems

Future research must transition from static decision models to dynamic ecosystems capturing lung cancer's progressive nature. Longitudinal studies could track how surrogates adapt strategies to cognitive decline, familial dynamics, and ethical dilemmas, establishing evidence-based frameworks for decision adjustment.

5.2 Technology-Enhanced Advance Care Planning

Virtual reality simulations could acclimatize stakeholders to end-of-life scenarios, reducing decision aversion. Artificial intelligence (AI) systems may dynamically optimize care plans using real-time biomarkers (e.g., circulating tumor DNA) and patient-reported outcomes, ensuring alignment with evolving values.

5.3 Ethical Safeguards and Proxy Well-Being

Investigations into proxy psychological distress — particularly when balancing personal biases against patient wishes — are critical. Institutionally mandated counseling services and ethical oversight committees could mitigate burnout and safeguard decision integrity.

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References

[1] Kerstens C, Wildiers H P M W, Schroyen G, et al. A systematic review on the potential acceleration of neurocognitive aging in older cancer survivors[J]. Cancers, 2023, 15(4): 1215.

[2] HAMMAMI M M, ABUHDEEB K, BALKHI A A. Importance hierarchy of surrogate medical decision making determinants: a Q-methodology study in Middle Eastern and East Asian men［J］. Medical Decision Making, 2020, 40(8): 1020-1033.

[3] Comer A R, Slaven J E, Montz A, et al. Nontraditional surrogate decision makers for hospitalized older adults[J]. Medical care, 2018, 56(4): 337-340.

[4] Weiss G B. Paternalism modernised[J]. Journal of medical ethics, 1985, 11(4): 184-187.

[5] Shepherd V, Sheehan M, Hood K, et al. Constructing authentic decisions: proxy decision making for research involving adults who lack capacity to consent[J]. Journal of medical ethics, 2021, 47(12): e42-e42.

[6] Robins-Browne K. Autonomy and advance care plans: a relationship oversimplified[J]. Internal Medicine Journal, 2008, 38(7): 612-613.

[7] Jimenez G, Tan W S, Virk A K, et al. Overview of systematic reviews of advance care planning: summary of evidence and global lessons[J]. Journal of pain and symptom management, 2018, 56(3): 436-459. e25.

[8] Schmidt K, Damm K, Prenzler A, et al. Preferences of lung cancer patients for treatment and decision-making: a systematic literature review[J]. European journal of cancer care, 2016, 25(4): 580-591.

[9] Sinclair C, Auret K A, Evans S F, et al. Advance care planning uptake among patients with severe lung disease: a randomised patient preference trial of a nurse-led, facilitated advance care planning intervention[J]. BMJ open, 2017, 7(2): e013415.

[10] Ojha R P, Lu Y, Narra K, et al. Survival After Implementation of a Decision Support Tool to Facilitate Evidence-Based Cancer Treatment[J]. JCO Clinical Cancer Informatics, 2023, 7: e2300001.