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Chemotherapy and Radiation Therapy Completion Rates in Rural Patients with Stage III Lung Cancer: *A Focus on Arkansas*

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ABSTRACT:

Lung cancer remains the leading cause of cancer-related mortality in the United States, with stage III non-small cell lung cancer (NSCLC) presenting a particularly formidable clinical challenge. Concurrent chemoradiotherapy (cCRT) is the standard of care for patients with unresectable stage III NSCLC, yet treatment completion rates are influenced by geographic, socioeconomic, and structural factors that disproportionately affect rural populations. Arkansas, a state characterized by high rurality, elevated smoking prevalence, and significant oncology workforce shortages, exemplifies the intersection of these disparities. This narrative review synthesizes available evidence on chemotherapy and radiation therapy completion rates in rural patients with stage III lung cancer, with particular attention to the Arkansas context. The review draws upon population-based registry data, national cohort analyses, and state-level epidemiological reports to characterize the scope of rural treatment disparities. Findings indicate that rural patients are significantly less likely to receive guideline-concordant treatment for stage III NSCLC, with completion rates reduced by institutional-level resource limitations, provider shortages, transportation barriers, and socioeconomic disadvantage. In Arkansas, where lung cancer incidence ranks among the highest nationally (68.2 per 100,000) and smoking prevalence is second worst in the nation (18.7%), these disparities are compounded by limited access to screening, late-stage diagnosis, and a fragile rural healthcare infrastructure. The review concludes with recommendations for targeted interventions, including tele-oncology expansion, workforce development, and community-based navigation programs, to improve treatment completion and outcomes in rural Arkansas and similarly situated states.

KEYWORDS: *stage III lung cancer, concurrent chemoradiotherapy, treatment completion, rural disparities, Arkansas, oncology workforce, guideline-concordant care*

INTRODUCTION:

Lung cancer is the leading cause of cancer death in the United States, accounting for an estimated 1.8 million deaths annually worldwide (Sung *et al*., 2021). Non-small cell lung cancer (NSCLC) constitutes approximately 85% of all lung cancer diagnoses, and roughly one-third of patients present with stage III disease at the time of initial diagnosis (Herbst *et al*., 2018; Łazar-Poniatowska *et al*., 2021). For patients with unresectable stage III NSCLC, concurrent chemoradiotherapy (cCRT), the administration of platinum-based chemotherapy simultaneously with definitive thoracic radiation,

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represents the established standard of care, supported by multiple randomized trials and meta-analyses demonstrating its superiority over sequential approaches (Aupérin *et al*., 2010; Curran *et al*., 2011). The landmark PACIFIC trial subsequently established consolidation immunotherapy with durvalumab following cCRT as the new standard, yielding a 5-year overall survival rate of approximately 42.9% (Spigel *et al*., 2022).

Despite these therapeutic advances, the translation of evidence-based care into clinical practice is neither uniform nor equitable. A national analysis of 441,812 lung cancer cases in the National Cancer Database (NCDB) revealed that overall adherence to guideline-concordant treatment was only 62.1%, with adherence rates varying substantially across clinical subgroups and demographic strata (Blom *et al*., 2020). For stage III NSCLC specifically, guideline-concordant care, defined as receipt of chemotherapy in addition to radiation therapy or surgery, was observed in only 36% to 41% of patients, with significant disparities by race, age, and socioeconomic status (Fang *et al*., 2018).

Geographic rurality has emerged as an independent predictor of suboptimal cancer care and worse outcomes. Per capita lung cancer mortality is 18-20% higher in rural areas than in urban areas, a disparity that has widened over the past two decades (Atkins *et al*., 2017; Bernacchi *et al*., 2018). Rural populations face a constellation of barriers to optimal cancer treatment, including limited availability of oncology specialists, fewer radiation therapy facilities, extended travel distances, transportation challenges, lower rates of insurance coverage, and higher prevalence of modifiable risk factors such as smoking (Charlton *et al*., 2015; Blake *et al*., 2017). The American Society of Clinical Oncology (ASCO) has documented that only 3% of medical oncologists practice in rural areas, despite 20% of the U.S. population residing in these communities, and that two-thirds of rural counties lack any oncologist (Kirkwood *et al*., 2018; ASCO, 2020).

Table 1: Selected Rural-Urban Disparities in Lung Cancer Treatment and Outcomes

Measure	Rural	Urban	P-value / Source
Stage I NSCLC surgery rate (%)	69	75	$p < 0.001$
Stage I NSCLC median survival (month)	40	52	$p = 0.0006$
Stage-preferred treatment (OR), rural vs. urban institution	1.00 (ref)	1.68	95% CI 1.44–1.96
Guideline-concordant Tx, stage III NSCLC, Black vs. White (%)	36	41	$p = 0.0001$
Oncologists per 100,000 population	2.2	6.6	ASCO 2020
Radiation oncologists planning retirement within 5 yr (%)	30	18	ASTRO 2019
Counties with no oncology provider (%)	64	—	ASCO 2020
Lung cancer mortality AAPC (2013–2021), White men	−4.0	−4.8	Howlader 2025
Lung cancer mortality AAPC (2013–2021), Black men	−4.5	−5.4	Howlader 2025
Adjuvant chemotherapy receipt, pN1 NSCLC, rural (OR)	1.23*	1.00 (ref)	$p < 0.001$

Arkansas occupies a unique and concerning position within this landscape of rural cancer disparities. The state ranks 47th nationally for lung cancer incidence at 68.2 per 100,000, substantially exceeding the national rate of 52.8 per 100,000 (American Lung Association [ALA], 2024). Arkansas has the second-highest adult smoking rate in the nation at 18.7%, compared to the national average of 11.6%, and its lung cancer survival rate of 22.6% ranks third-worst among all states (ALA, 2024). More than half of Arkansas's 75 counties are classified as rural, and the state's Delta region counties, characterized by persistent poverty, limited healthcare infrastructure, and high proportions of racial and ethnic minority populations, bear a disproportionate burden of cancer morbidity and mortality (Arkansas

Department of Health, 2024; County Health Rankings, 2024). Arkansas is also one of the designated "Tobacco Nation" states, where average smoking rates are more than 40% higher than in other states (U.S. Surgeon General, 2024).

The purpose of this review is to synthesize available evidence on chemotherapy and radiation therapy completion rates in rural patients with stage III lung cancer, situating these findings within the specific epidemiological and structural context of Arkansas. The review examines the magnitude of rural–urban treatment disparities, identifies key barriers to treatment completion, and proposes evidence-informed strategies for improving outcomes in underserved rural communities.

METHODS:

This narrative review was conducted through a systematic search of the PubMed (MEDLINE), Embase, and Web of Science databases for studies published in English between 2000 and 2025. The search strategy combined Medical Subject Headings (MeSH) terms with free-text terms, including "stage III lung cancer," "chemoradiotherapy," "treatment completion," "rural disparities," "guideline-concordant treatment," and "Arkansas." Eligible publications included original research articles, systematic reviews, meta-analyses, and population-based registry analyses. Gray literature was also reviewed, including reports from the American Lung Association, the American Cancer Society, the Arkansas Central Cancer Registry (ACCR), the Arkansas Department of Health, and the AACR Cancer Disparities Progress Report.

National-level data were drawn from the Surveillance, Epidemiology, and End Results (SEER) program, the National Cancer Database (NCDB), the National Program of Cancer Registries (NPCR), and the Centers for Disease Control and Prevention (CDC) WONDER mortality database.

Table 2: Barriers to Chemotherapy and Radiation Therapy Completion in Rural Patients With Stage III NSCLC

Barrier Category	Specific Factors	Evidence / Impact
Workforce Shortages	Only 3% of medical oncologists practice in rural areas; 2/3 of rural counties lack any oncologist	Reduced initiation of multimodality therapy; delayed treatment start; fewer clinical trial enrollments (ASCO, 2020; Charlton *et al*., 2015)
Radiation Access	Fewer radiation therapy facilities; 30% of rural radiation oncologists plan retirement within 5 years	Inability to deliver daily fractionated RT over 6-7 weeks; shift to less effective palliative regimens (ASTRO, 2019)
Transportation / Distance	Extended travel distances (>50 miles); lack of reliable transportation; cumulative travel burden for 30-35 daily RT fractions	Significantly lower adjuvant chemotherapy and RT use for patients >50 miles from facility (Ambroggi *et al*., 2015)
Socioeconomic Factors	Higher uninsured rates; persistent poverty; lower educational attainment; Medicaid non-expansion (historical)	Rural + persistent poverty counties have highest smoking prevalence and worst lung cancer mortality (Zahnd *et al*., 2025)
Institutional Resources	Rural institutions less likely to offer guideline-concordant care; limited multidisciplinary tumor boards	Institution-level disparity exceeds patient-level geography: OR 1.68 for urban vs. rural institution (Okereke *et al*., 2020)
Late-stage Diagnosis	Low screening uptake (AR: 14.3-16.6%); limited LDCT availability in rural areas	Later diagnosis limits curative-intent cCRT eligibility; shifts treatment toward palliative approaches (ALA, 2024)
Treatment Toxicity	Grade 3+ esophagitis (7-21%); pneumonitis; weight loss; performance status decline during cCRT	20–25% early mortality within 1 year of cCRT initiation; treatment delays and dose reductions (Vaes *et al*., 2025)
Surveillance Gaps	Arkansas lacks post-diagnosis case tracking; COVID-19 disrupted 2020–2022 data	Cannot directly measure state-specific treatment completion rates; limits targeted intervention planning (ALA, 2024)

Note. cCRT: concurrent chemoradiotherapy; RT: radiation therapy; LDCT: low-dose computed tomography; OR: odds ratio. Sources as cited in the text.

State-level data for Arkansas were obtained from the ACCR, the 2024 Arkansas Cancer Facts and Figures report, and the American Lung Association's annual "State of Lung Cancer" reports. Rural–urban classification was based on the USDA Rural-Urban Continuum Codes (RUCC) and Rural-Urban Commuting Area (RUCA) codes, consistent with established methodologies in the cancer disparities literature.

Stage III NSCLC was defined according to the American Joint Committee on Cancer (AJCC) 8th edition TNM staging classification, encompassing stages IIIA, IIIB, and IIIC. Guideline-concordant treatment (GCT) for stage III NSCLC was operationally defined as receipt of chemotherapy in addition to radiation therapy or surgical resection, consistent with National Comprehensive Cancer Network (NCCN) guidelines. Treatment completion was defined as the administration of the planned course of concurrent or sequential chemoradiotherapy without premature discontinuation. Rurality was defined using RUCC codes 4-9 or RUCA-based designations, as specified by each individual study.

RESULTS:

National Patterns of Treatment Completion in Stage III NSCLC:

Concurrent chemoradiotherapy remains the standard of care for locally advanced, unresectable stage III NSCLC, with a median overall survival of 20-30 months and a 5-year survival of approximately 20-30% with cCRT alone (Łazar-Poniatowska *et al*., 2021). However, the toxicity profile of cCRT is substantial: high rates of grade 3 or higher esophagitis and pneumonitis frequently result in treatment delays, dose reductions, or premature discontinuation (Curran *et al*., 2011). In the RTOG 0617 trial, which enrolled 544 patients with stage III NSCLC from centers across the United States and Canada, the standard 60 Gy radiation arm demonstrated superior outcomes to the dose-escalated 74 Gy arm, with two-year overall survival of 57.6% versus 44.6%, partly attributable to increased toxicity and treatment-related mortality in the higher-dose cohort (Bradley *et al*., 2015).

The most comprehensive assessment of guideline adherence was a national analysis of 441,812 lung cancer cases from the NCDB (2010-2014), which found that overall adherence to NCCN-recommended treatment was only 62.1% across all stages and histologies (Blom *et al*., 2020). Guideline concordance was notably lower for advanced-stage NSCLC than for early-stage disease. A separate study using the NCDB reported that for stage III NSCLC, only 36-41% of patients received chemotherapy in addition to radiation or surgery, depending on race, with Black patients receiving guideline-concordant care at significantly lower rates than White patients (36% vs. 41%, $p = 0.0001$) (Fang *et al*., 2018). Elderly patients (aged 70 and older) and those with multiple comorbidities were also substantially less likely to receive the recommended multimodality therapy.

Treatment completion within clinical trial populations provides an upper-bound benchmark. In the PACIFIC trial, 49.0% of patients completed the full 12 months of consolidation durvalumab therapy, while 31.3% discontinued due to disease progression (Girard *et al*., 2024). In the real-world setting, completion rates for cCRT itself are lower: approximately 20–25% of patients with stage III NSCLC die within one year of initiating chemoradiotherapy, a figure characterized as "futile treatment" in recent prognostic modeling studies (Vaes *et al*., 2025). The NATCH trial reported that compliance with neoadjuvant chemotherapy was substantially higher than with adjuvant chemotherapy (90% vs. 61%), highlighting the importance of treatment sequencing in determining completion rates (Felip *et al*., 2010).

Rural-Urban Disparities in Lung Cancer Treatment:

Rural residence is independently associated with reduced probability of receiving guideline-concordant cancer care. A retrospective cohort study

of 348,002 patients from the SEER database (2000-2006) found that rural patients diagnosed with stage I NSCLC underwent fewer surgeries than their urban counterparts (69% vs. 75%, $p < 0.001$) and experienced significantly reduced median survival (40 vs. 52 months, $p = 0.0006$) (Atkins *et al.,* 2017). While no statistically significant survival difference was observed in advanced-stage disease during this early study period, the authors attributed this to the absence of effective treatments at the time rather than to equitable care delivery.

A more recent analysis conducted within the Delta Regional Authority catchment area (2011-2017) examined guideline-concordant treatment across five institutions serving a heavily rural population in which 47% of the 6,259 patients resided in rural areas (Okereke *et al*., 2020). Compared with rural residents treated at rural institutions, both urban and rural residents attending urban institutions were significantly more likely to receive stage-preferred treatment (OR 1.68 [95% CI, 1.44–1.96] and OR 1.33 [95% CI, 1.11–1.61], respectively). Critically, the institution-level disparity exceeded the patient-level disparity, suggesting that the resources and infrastructure available at the treating facility, rather than patient geography alone, drive much of the observed treatment gap. Guideline-concordant care appeared to mitigate the survival disparity, as rural patients treated at urban institutions achieved outcomes comparable to urban patients. Table 1 summarizes the principal rural-urban treatment disparities identified in the literature.

The oncology workforce deficit is a structural determinant of rural treatment disparities. ASCO's 2020 workforce analysis reported that approximately 64% of U.S. counties had no oncology care provider whose primary practice site was within that county, and two-thirds of rural counties specifically lacked any oncologist (Kirkwood *et al*., 2018; ASCO, 2020). Access to radiation oncology is similarly constrained: the 2017 ASTRO workforce study found that nearly 30% of radiation oncologists in rural communities planned to retire or reduce their clinical hours within 5 years, compared with 18% in urban and suburban settings (ASTRO, 2019). National data indicate 6.6 oncologists per 100,000 population in urban areas versus only 2.2 per 100,000 in rural areas, and recent projections suggest that by 2037, non-urban areas will have only 29% of the oncology specialists needed to meet demand (Al-Rahawan, 2026).

Transportation and distance to treatment represent additional barriers that directly impact treatment completion. A population-based study found that the use of adjuvant chemotherapy for stage III colon cancer and radiation therapy for stage II–III rectal cancer was significantly lower among patients living more than 50 miles from their treatment facility than among those within 12.5 miles (Ambroggi *et al*., 2015). For stage III NSCLC, where cCRT typically requires daily radiation treatments over six to seven weeks with concurrent weekly chemotherapy, the cumulative burden of repeated long-distance travel is considerable. Rural patients who might otherwise complete therapy may abandon treatment prematurely due to the physical and financial toll of extended travel. Table 2 provides a comprehensive overview of barriers to treatment completion in rural populations.

The Arkansas Context:

Arkansas presents a case study in the convergence of multiple risk factors that contribute to suboptimal lung cancer treatment. The state's lung cancer incidence rate of 68.2 per 100,000 significantly exceeds the national rate of 52.8 per 100,000, ranking it 47th nationally (ALA, 2024). The adult smoking prevalence of 18.7%, the second highest in the nation, is more than 60% above the national average of 11.6% (ALA, 2024). Arkansas is one of five states that rank in the top ten nationally for all four tobacco-related cancer outcomes: smoking prevalence, smoking-associated cancer incidence, smoking-associated cancer mortality, and the proportion of smoking-attributable cancer deaths (Villanti *et al*., 2021). Table 3 presents a summary comparison of key lung cancer indicators for Arkansas relative to national benchmarks.

The five-year lung cancer survival rate in Arkansas is 22.6%, ranking third worst among the 47 states for which data are available, compared with the national average of 28.4% (ALA, 2024). Lung cancer screening uptake among high-risk individuals in Arkansas was only 14.3-16.6%, not significantly different from the national rate but far below the level needed for meaningful population-level impact (ALA, 2024). The ACCR has reported that the state's cancer surveillance data were significantly disrupted by COVID-19, with complete data on early diagnosis rates, surgical treatment rates, and treatment modality not available for 2021-2022. Arkansas is also one of the 12 states that do not track cancer cases after diagnosis, precluding direct measurement of state-specific treatment completion rates (ALA, 2024).

The 2024 County Health Rankings report for Arkansas revealed persistent and widening gaps between urban and rural counties. The healthiest counties (Benton, Washington, and Franklin) are located in the state's rapidly urbanizing northwest corridor, while the least healthy counties (Monroe, Lee, and Phillips) are concentrated in the Arkansas Delta, a region of persistent poverty, high proportions of Black residents, limited healthcare infrastructure, and elevated cancer mortality (ACHI, 2024). Rural counties in Arkansas experienced a higher annual percent change in colorectal cancer incidence (0.74%) compared with urban counties (0.09%) from 2011 to 2019, a pattern likely mirrored in lung cancer, given the shared risk factors of smoking and limited access to care (Hussain *et al*., 2024). Geographic analysis from the ACCR has documented that rural Arkansas counties had higher age-standardized cancer mortality rates than urban counties across the 2013-2017 reporting period (Arkansas Department of Health, 2020).

Jefferson County, located in southeast Arkansas and home to the Jones-Dunklin Cancer Center at Jefferson Regional in Pine Bluff, represents a particularly instructive microcosm of these statewide disparities. With an estimated population of approximately 63,672, Jefferson County is majority Black (56.1%), with White residents comprising 37.2% of the population (U.S. Census Bureau, 2024). The county's poverty rate stands at 17.1%, with a median household income of $48,552, significantly below the statewide median, and its county seat, Pine Bluff, registers a poverty rate of approximately 24%, with a median household income of $42,718 (U.S. Census Bureau, 2024; World Population Review, 2024). These socioeconomic conditions, combined with the county's high proportion of Black residents, are epidemiologically significant: Black Arkansans experience lung cancer incidence rates of 65.7 per 100,000, substantially exceeding the national rate of 54.2 among Black individuals, and are the least likely demographic group in Arkansas to receive surgical treatment for lung cancer (American Lung Association, 2024). Jefferson County's position within the broader Arkansas Delta geography surrounded by persistently poor, heavily rural counties means that its catchment population for the Jones-Dunklin Cancer Center extends well beyond county boundaries to include patients from some of the most underserved communities in the state, many of whom face the compounded disadvantages of rurality and persistent poverty that the literature has consistently linked to higher lung cancer mortality (Bernacchi et al., 2025; Moss et al., 2020).

Arkansas's membership in the Delta Regional Authority, a federally designated region of persistent poverty encompassing counties across eight Southern states, further compounds the challenges to access to treatment. Within this region, the interaction of rurality and persistent poverty has been shown to produce the highest county-level smoking prevalence and the worst lung cancer mortality outcomes in the nation (Bernacchi *et al*., 2025). Black men living in southern states, including Arkansas, experience among the highest lung cancer incidence rates in the country, and Black Americans in Arkansas are the least likely to receive surgical treatment for lung cancer (ALA, 2020; Brown *et al*., 2023).

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These racial and socioeconomic disparities converge with acute force at the level of Jefferson County. As a majority-Black county embedded within the Arkansas Delta, Jefferson County represents the type of community that Bernacchi *et al.* (2025) identified as bearing the highest lung cancer burden in their analysis of rural, persistent poverty counties where the combined effect of rurality and sustained economic disadvantage produces the worst lung cancer incidence and mortality outcomes nationally. In addition to the Central Arkansas Radiation Therapy Institute (CARTI), the Jones-Dunklin Cancer Center at Jefferson Regional, which includes a medical oncology, infusion center, hematology services, low-dose lung cancer screening, radiation oncology, clinical trials infrastructure, and a satellite clinic in Monticello, is the primary cancer care facility serving Jefferson County and the surrounding region (Jefferson Regional, 2024). While the presence of this center represents a critical asset in a region that would otherwise lack any proximate oncology services, it operates within an environment defined by the very structural barriers; patient poverty, uninsurance, transportation limitations, and a predominantly Black patient population facing documented racial disparities in surgical treatment that the national literature consistently associates with reduced guideline-concordant care and lower treatment completion rates (Fang et al., 2018; Brown et al., 2023).

DISCUSSION:

The evidence synthesized in this review demonstrates that rural patients with stage III lung cancer face systematic disadvantages in receiving and completing guideline-concordant chemoradiotherapy, and that Arkansas, by virtue of its high rurality, elevated smoking prevalence, limited oncology infrastructure, and concentrated persistent poverty, represents an acute manifestation of these nationwide disparities. Several key themes emerge from the available literature that merit further discussion.

Table 3: Lung Cancer Indicators: Arkansas Versus National Benchmarks

Indicator	Arkansas	National	State Rank
Lung cancer incidence (per 100,000)	68.2	52.8	47th of 51
5-year survival rate (%)	22.6	28.4	45th of 47
Adult smoking prevalence (%)	18.7	11.6	50th of 51
Screening rate among high-risk (%)	14.3-16.6	16.0-18.2	33rd of 51
Early-stage diagnosis rate (%)	N/A*	27.4-8.1	N/A
Surgical treatment rate (%)	N/A*	20.7	N/A
Requires biomarker testing coverage	Partial	—	—

Note. *Data not available due to COVID-19 disruptions in cancer surveillance for 2021–2022. State rank expressed as position among states for which data are available (lower rank = worse performance). Sources: American Lung Association (2024); Arkansas Department of Health (2024).

Institutional-Level Factors Predominate Over Patient-Level Geography:

The finding from the Delta Regional Authority catchment study that institution-level disparities exceed patient-level geographic disparities (Okereke *et al.*, 2020) has important implications for intervention design. It suggests that the path to equitable treatment completion lies not merely in moving patients closer to care, but in bringing the resources, expertise, and infrastructure of high-performing urban cancer centers to rural communities. This finding is corroborated by clinical trial data demonstrating that when rural patients receive standardized, protocol-driven care, the rurality-associated survival disparity is eliminated entirely (Unger *et al.*, 2018). The challenge, then, is one of healthcare delivery system design rather than patient behavior.

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Table 4: Recommended Interventions to Improve Treatment Completion in Rural Stage III NSCLC

Intervention Domain	Strategy	Precedent / Rationale
Tele-oncology	Virtual multidisciplinary tumor boards; remote chemotherapy supervision; telemedicine follow-up	Reduces geographic barriers; evidence of improved care coordination in pilot programs (ASCO, 2020)
Satellite Clinics	Regional cancer care networks extending urban center services to rural communities	Duke University and OSUCCC models demonstrate feasibility of hub-and-spoke care delivery (Kirkwood *et al*., 2018)
Patient Navigation	Community health workers addressing transportation, financial counseling, and psychosocial support	Lung Diagnostic Assessment Programs (LDAPs) with nurse navigators improve staging completeness and timeliness (AlGhamdi *et al*., 2024)
Workforce Development	Targeted rural recruitment; loan repayment programs; expanded APP roles; primary care involvement in survivorship	ASCO loan repayment initiative; training non-oncologists to deliver protocol-driven follow-up care (Charlton *et al*., 2015)
Surveillance Infrastructure	Post-diagnosis case tracking; treatment completion reporting; real-time registry data	Arkansas is one of 12 states without post-diagnosis tracking; critical for measuring intervention impact (ALA, 2024)
Tobacco Control	Expanded cessation programs in rural communities; smokefree policies; Medicaid coverage for cessation aids	Arkansas is a Tobacco Nation state; rural smoking prevalence 15.4% vs. 10.1% urban nationally (Surgeon General, 2024)

Note. APP: advanced practice provider; LDAP: Lung Diagnostic Assessment Program; OSUCCC: Ohio State University Comprehensive Cancer Center. Sources as cited in the text.

This institutional-level finding is directly applicable to Jefferson County and its surrounding catchment region. In addition to CARTI, the Jones-Dunklin Cancer Center at Jefferson Regional serves as the primary community oncology resource for a wide geographic area that includes multiple persistently poor, predominantly Black Delta counties. The center's capacity to deliver guideline-concordant concurrent chemoradiotherapy for stage III NSCLC a treatment regimen requiring daily radiation fractions over six to seven weeks with concurrent chemotherapy is constrained by the same structural factors documented in the Delta Regional Authority cohort study (Okereke et al., 2020): a patient population with high rates of poverty and uninsurance, and a service area that extends into counties where patients face transportation distances that would be prohibitive for daily radiation attendance. The county's 17.1% poverty rate and the predominance of Medicaid and uninsured patients in its catchment area further constrain the financial sustainability of maintaining the full scope of multimodality oncology services required for stage III NSCLC management (U.S. Census Bureau, 2024; County Health Rankings, 2024).

The Treatment Completion Gap Is a Quality-of-Care Issue:

The overall guideline-concordance rate of 62.1% for lung cancer nationally (Blom *et al*., 2020) and the 36-41% concordance rate for stage III NSCLC specifically (Fang *et al*., 2018) indicate that treatment completion is not merely a rural problem but a systemic quality challenge that is amplified in underserved settings. In rural Arkansas, where oncology specialists are scarce and radiation therapy facilities may be hours away, the gap between evidence-based recommendations and delivered care is expected to be wider still. The absence of Arkansas-specific treatment completion data in the published literature represents a critical knowledge gap that warrants dedicated investigation.

Workforce Shortages as a Root Cause:

The oncology workforce crisis is arguably the single most consequential structural barrier to treatment completion in rural areas. With only 3% of medical oncologists practicing in rural settings (Charlton *et al*., 2015), and with rural radiation oncologists retiring at disproportionately high rates (ASTRO, 2019), the capacity to initiate and sustain multimodality therapy for stage III NSCLC is fundamentally constrained. In Arkansas, where rural hospital closures and physician shortages mirror national trends, the workforce gap threatens to widen further unless proactive recruitment and retention

strategies are deployed. ASCO's loan repayment programs for oncologists committed to rural practice, tele-oncology initiatives, and expanded roles for advanced practice providers represent promising but still insufficient responses to the scale of the problem.

Jefferson County illustrates this workforce challenge at the community level. Pine Bluff, the county's largest city and home to the Jones-Dunklin Cancer Center, has experienced a sustained population decline of approximately 8% between 2020 and 2024, and its economic profile poses significant challenges for recruiting and retaining specialist physicians (World Population Review, 2024). The center's geographic isolation from the academic oncology centers in Little Rock (approximately 45 miles) means that patients requiring subspecialty consultation or advanced radiation techniques, including intensity-modulated radiation therapy or stereotactic body radiotherapy, must travel to facilities that may be inaccessible to the largely low-income, transportation-dependent patient population it serves. Black Arkansans experiencing lung cancer mortality at rates nearly double those of national comparators represent a disproportionate share of the Jones-Dunklin patient population, making workforce stability at this institution a matter of direct equity consequence (ACHI, 2025; ALA, 2024).

Recommendations for Arkansas and Similar States:

Several evidence-informed strategies may improve treatment completion rates for stage III lung cancer in rural Arkansas. Table 4 outlines the principal intervention domains, specific strategies, and supporting precedent for each recommendation.

First, the expansion of tele-oncology programs, including virtual multidisciplinary tumor boards, remote chemotherapy supervision, and telemedicine-based follow-up, can extend the reach of urban cancer centers into rural communities. Second, the development of regional cancer care networks, modeled on the satellite-clinic approach used by institutions such as Duke University and the Ohio State University Comprehensive Cancer Center, can bring specialized oncology services to communities that lack them. Third, patient navigation programs staffed by community health workers can address the transportation, financial, and psychosocial barriers that lead to treatment abandonment. Fourth, investment in oncology workforce development, including targeted recruitment of medical students and residents from rural backgrounds, enhanced loan repayment incentives, and training of primary care physicians to deliver follow-up survivorship care, is essential for long-term sustainability. Finally, an improved cancer surveillance infrastructure in Arkansas, including post-diagnosis case tracking and treatment completion reporting, is necessary to quantify the scope of the problem and evaluate the impact of interventions.

Jefferson County and the Jones-Dunklin Cancer Center at Jefferson Regional merit specific attention in any statewide intervention strategy for rural lung cancer disparities. First, the center's existing infrastructure, including an infusion center, radiation oncology, and a Monticello satellite clinic, provides a foundation for tele-oncology expansion and serves as a natural hub for a regional care network that extends to the deeply rural Delta counties within its catchment area. Second, given the predominance of Black patients in Jefferson County's oncology patient population, culturally tailored patient navigation programs staffed by community health workers with demonstrated effectiveness in Black communities should be prioritized as a mechanism for addressing the documented racial disparity in surgical treatment and for supporting adherence to six-to-seven-week concurrent chemoradiotherapy regimens. Third, the county's status as a Delta Regional Authority catchment county and its qualifying socioeconomic profile make it an appropriate target for federal rural health workforce incentive programs, including Health Profession Shortage Area (HPSA) designation-linked loan repayment, and for NCI's Persistent Poverty

Initiative, which has established cancer control research centers specifically in communities with Jefferson County's socioeconomic profile (AACR, 2024; County Health Rankings, 2024).

LIMITATIONS:

This review has several limitations. First, the absence of published, Arkansas-specific data on chemotherapy and radiation completion rates for stage III lung cancer necessitated reliance on national and regional datasets to infer state-level patterns. Second, the heterogeneity of rural-urban classification schemes across studies limits the direct comparability of findings. Third, the disruption of cancer surveillance data in Arkansas during 2020–2022 due to COVID-19 has created a gap in the most recent state-level epidemiological data. Fourth, the narrative review methodology, while appropriate for synthesizing a broad evidence base, does not permit the quantitative precision of a systematic review or meta-analysis.

CONCLUSION:

Chemotherapy and radiation therapy completion rates for stage III lung cancer are suboptimal nationally and are further diminished in rural populations by structural barriers, including oncology workforce shortages, limited radiation therapy infrastructure, transportation challenges, and socioeconomic disadvantage. Arkansas, with its high lung cancer incidence, extreme smoking prevalence, fragile rural healthcare system, and concentrated persistent poverty in the Delta region, represents a state where these disparities converge with particular intensity. Addressing the rural treatment completion gap requires a multifaceted approach that targets institutional capacity, workforce development, care delivery innovation, and cancer surveillance infrastructure. Without deliberate and sustained investment, the promise of modern multimodality therapy for stage III lung cancer will continue to bypass the rural communities that need it most.

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