• Disclosure

Association of Women Surgeons Signature Speaker Series
The effect of socioeconomic status on treatment and mortality for non-small cell lung cancer patients

Lower Socioeconomic Status

Greater odds of no surgery

Worse survival overall

OR 1 $\rightarrow$ 4.7

21.8% vs 71.8%

Treatment/Surgical Disparities Persist for NSCLC

Timeline of Surgical Disparities in the US

- 1999: Black population
- 2006: Invasive staging
- 2009: Surgical recommendation
- 2011: PET imaging
- 2012: Patient attitudes and perspectives toward surgery
- 2013: Comorbidity burden
- 2013: Insurance payer status
- 2014: Distance to hospital
- 2016: VA system
- 2017: Urban-rural area of residence
- 2018: Clinical trial participants
Timeline of Surgical Disparities in the US

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>Black population</td>
</tr>
<tr>
<td>2004</td>
<td>Invasive staging</td>
</tr>
<tr>
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</tr>
<tr>
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</tr>
<tr>
<td>2016</td>
<td>State of residence</td>
</tr>
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<td>Urban-rural area of residence</td>
</tr>
<tr>
<td>2018</td>
<td>Clinical trial participants</td>
</tr>
</tbody>
</table>

TABLE 4 Results of Bivariate and Multiple Logistic Regression for Surgical Resection

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unadjusted OR (95% CI)</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at diagnosis 65 years or older</td>
<td>0.44 (0.24-0.81)</td>
<td>0.41 (0.20-0.83)</td>
</tr>
<tr>
<td>Black men¹</td>
<td>0.16 (0.06-0.38)</td>
<td>0.13 (0.04-0.47)</td>
</tr>
<tr>
<td>White women¹</td>
<td>1.06 (0.59-1.92)</td>
<td>0.88 (0.44-1.78)</td>
</tr>
<tr>
<td>Black women¹</td>
<td>0.93 (0.21-1.42)</td>
<td>0.870 (0.13-3.69)</td>
</tr>
<tr>
<td>Current smoking</td>
<td>0.53 (0.30-0.94)</td>
<td>0.52 (0.28-0.98)</td>
</tr>
<tr>
<td>College</td>
<td>1.18 (0.64-2.16)</td>
<td>1.31 (0.66-2.62)</td>
</tr>
</tbody>
</table>

1999 population

Figure 2 – Unadjusted rates of surgical resection in patients with stage I non-small cell lung cancer, stratified by race and sex.
Potential Mechanisms of Surgical Disparities

Does the patient want to have surgery?
1. Desire for treatment
2. Disease Burden
3. Clinical Factors (smoking/comorbidities)
4. Demographics
5. Functional Status
6. Distance to treatment/access to surgeon
7. Nihilism/Stigma

Is the patient referred for surgery?
- **Physician Factors:**
  1. Training/Experience
  2. Belief in benefit
  3. Fear of harm
  4. Comorbidity Bias
  5. Personality/Bias
  6. Nihilism/Stigma
  7. Surgical Referral Options

- **Health Systems Factors:**
  1. Tumor Board
  2. National guidelines
  3. Referral Patterns
  4. Proximity to Surgeons

Can the patient have surgery?
- **Surgeon Factors:**
  1. Training/Experience
  2. Is disease resectable?
  3. Belief in benefit
  4. Fear of harm
  5. Fear of perception in oncology community
  6. Personality/Bias
  7. Nihilism/Stigma

Receipt of surgery
Potential Mechanisms of Surgical Disparities

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2. Disease burden
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4. Demographics
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Physician Factors:
1. Training/Experience
2. Belief in benefit
3. Fear of harm
4. Comorbidity bias
5. Personality/Bias
6. Nihilism/Stigma
7. Surgical referral options

Health Systems Factors:
1. Tumor board
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Surgeon Factors:
1. Training/Experience
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5. Fear of perception in oncology community
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# Potential Mechanisms of Surgical Disparities

## Receipt of surgery

1. Desire for treatment
2. Disease burden
3. Clinical factors (smoking/comorbidities)
4. Demographics
5. Functional status
6. Distance to treatment/access to surgeon
7. Nihilism/stigma

## Physician factors

1. Training/experience
2. Belief in benefit
3. Fear of harm
4. Comorbidity bias
5. Personality/bias
6. Nihilism/stigma

## Other factors

1. Increased trust (for each 10-point increase on trust domain of the Primary Care Assessment Survey)
2. Marital status (no current partner)
3. Top quartile in age (>73 y)
4. ≥2 Comorbid conditions
5. Fatalism (10-point increase on mental adjustment to cancer on a 100-point scale)
6. Bottom quartile of physical component score on Short Form 12
7. Bottom quartile of mental component score on Short Form 12
8. Religiosity (determined by agreement with the statement: faith alone can cure disease)
9. Lowest 2 tertiles of median household income (vs highest)

## Table 5. Regression Predictors of Decisions Against Lung Cancer Surgery in Patients With Stage 1 or 2 Non-Small Cell Cancer (N = 386)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Overall</th>
<th>Black Patients (n = 113)</th>
<th>White Patients (n = 273)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potentially reversible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belief that diagnosis is &lt;90% certain</td>
<td>0.37 (0.14-0.93)</td>
<td>0.43 (0.24-0.78)</td>
<td>0.26 (0.07-1.00)</td>
</tr>
<tr>
<td>Feeling that overall quality of life would be worse in 1 year after undergoing surgery</td>
<td>0.27 (0.14-0.50)</td>
<td>0.25 (0.08-0.79)</td>
<td>0.25 (0.17-0.37)</td>
</tr>
<tr>
<td>Perception of poor cancer communication (score drops 5 of 25 points)</td>
<td>0.42 (0.32-0.74)</td>
<td>0.27 (0.15-0.51)</td>
<td>0.47 (0.24-0.93)</td>
</tr>
<tr>
<td>No regular source of health care</td>
<td>0.60 (0.21-1.72)</td>
<td>0.20 (0.10-0.43)</td>
<td>1.30 (0.32-5.30)</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black race</td>
<td>0.75 (0.57-0.99)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased trust (for each 10-point increase on trust domain of the Primary Care Assessment Survey)</td>
<td>0.84 (0.71-1.00)</td>
<td>0.54 (0.35-0.85)</td>
<td>1.00 (0.76-1.40)</td>
</tr>
<tr>
<td>Marital status (no current partner)</td>
<td>1.38 (0.80-2.41)</td>
<td>0.91 (0.36-2.30)</td>
<td>0.61 (0.37-0.99)</td>
</tr>
<tr>
<td>Top quartile in age (&gt;73 y)</td>
<td>0.32 (0.20-0.51)</td>
<td>0.48 (0.24-0.96)</td>
<td>0.33 (0.19-0.58)</td>
</tr>
<tr>
<td>≥2 Comorbid conditions</td>
<td>0.24 (0.08-0.73)</td>
<td>0.04 (0.01-0.25)</td>
<td>0.45 (0.10-2.00)</td>
</tr>
<tr>
<td>Fatalism (10-point increase on mental adjustment to cancer on a 100-point scale)</td>
<td>0.82 (0.74-0.92)</td>
<td>0.86 (0.75-0.98)</td>
<td>0.70 (0.49-0.98)</td>
</tr>
<tr>
<td>Bottom quartile of physical component score on Short Form 12</td>
<td>0.71 (0.38-1.33)</td>
<td>1.30 (0.19-11.0)</td>
<td>0.55 (0.32-0.93)</td>
</tr>
<tr>
<td>Bottom quartile of mental component score on Short Form 12</td>
<td>0.51 (0.28-0.91)</td>
<td>0.85 (0.09-8.30)</td>
<td>0.55 (0.24-1.23)</td>
</tr>
<tr>
<td>Religiosity (determined by agreement with the statement: faith alone can cure disease)</td>
<td>0.56 (0.39-0.79)</td>
<td>0.81 (0.19-5.50)</td>
<td>0.34 (0.21-0.56)</td>
</tr>
<tr>
<td>Lowest 2 tertiles of median household income (vs highest)</td>
<td>0.46 (0.23-0.98)</td>
<td>0.38 (0.11-1.20)</td>
<td>0.42 (0.22-0.84)</td>
</tr>
</tbody>
</table>
Mitigating Surgical Disparities

“Oh, they’re too old to have surgery”
Thoracic Surgeons need to decide who “can have” surgery

NSCLC Nihilism
Public Health awareness/education

“If I have surgery, when air touches my tumor its going to spread everywhere”
Acknowledge fears, myths, STIGMA

“I can’t drive that far for treatment”
Explain the realities of driving for surgery
Explain the rationale behind driving for increased quality of care

Disparities in staging perpetuate disparities in receipt of surgery
When patients refuse surgery

Put yourself in their shoes

What is driving their decision to refuse?
  Address it, don’t ignore it

What can you do as a provider to facilitate care?
  Connect with another patient
  Help with transportation logistics
  Facilitate affordable care
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