OCCUPATIONAL CARDIOVASCULAR
AND LUNG DISEASES IN NAVAJO
COAL MINERS

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Overview: Cardiovascular disease (CVD)

- **Leading cause of death** in the US
- **> 81 million Americans** have CVD, at an estimated cost of $503 billion in 2010
- **Multiple CVD risk factors** (personal and occupational)
- Estimated proportion of CVD associated with work-related factors ranges from **15 – 35%**
Personal risk factors for CVD

- Smoking
- High lipids/cholesterol
- Physical inactivity
- Diet/alcohol
- Hypertension
- Obesity
- Diabetes mellitus
- Family history of heart disease
Mining-related occupational risk factors for CVD

- Noise
- Particulates (PM 2.5)
- Stress (high demand/low control; shift work; long hours)
- Vibration
- Temperature extremes
- Carbon monoxide
- Some chemicals and metals (lead, solvents, carbon disulfide, nitrates)
Workplace factors contribute to obesity, smoking, alcohol use, and lack of exercise as well as to work-family stress and conflict.
Morbidity & disability among workers ≥18 years in the Mining sector, 1997-2007

- Blue collar workers less likely to have health insurance, health screening, health prevention information
- More likely to be obese, less likely to exercise, more likely to report risky behaviors (smoking, drinking)

[NIOSH, 2012]
Heart disease prevalence is high in the mining sector

![Bar graph showing heart disease prevalence across different sectors.](attachment:heart_disease-prevalence-graph.png)
High prevalence of hypertension in the mining sector (23.2%)
Coal miners are at risk for work-related lung disease

- **Lung** diseases from coal mine dust exposure:
  - Black lung (CWP)
  - Silicosis
  - Emphysema
  - Industrial bronchitis
  - Diffuse interstitial fibrosis
Miners Clinic Navajo coal miners 5 year medical screening program in Page, AZ
What do we know about rates of cardiovascular and lung disease in participating Navajo coal miners?
Most of our Navajo patients are surface coal miners.

Commodity Distribution For Navajo (N=231)

- **Coal**: Highest number of people
- **Metal**: Second highest number of people
- **Aggregate** and **NonMetal**: Least number of people
Characteristics of 231 Navajo miners

- **Average age:** 61.3 (10.3) years
- **93% men**
- **Ever smoker:** 12.6% (compared to 48% in MCC patients total)
- **Average years worked as a miner:** 20.8 yrs (13.4)
Respiratory symptoms are common

Symptoms Reported by Navajo (N=231)

Cough: 60%
Phlegm: 10%
Wheeze: 50%
Shortness of Breath: 70%
Pneumoconiosis in 231 Navajo coal miners

- Abnormal chest x-ray profusion score on B reading: **24 (10%)**
  - 1/0=10
  - 1/1=9
  - 1/2=5

- Benefits counseling and assistance with DOL Black Lung claims
Emphysema in 4-9% of participating Navajo coal miners

- COPD (LLN): 8 (4%)
  - 7 never smokers
- COPD (GOLD): 17 (8.6%)
  - 12 never smokers
## Hypertension in coal miners

<table>
<thead>
<tr>
<th>High blood pressure</th>
<th>Consequences of untreated hypertension</th>
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<tbody>
<tr>
<td>38% in Navajo coal miners</td>
<td>4 times as likely to die of stroke</td>
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<tr>
<td>43% in other coal miners</td>
<td>3 times as likely to die of heart disease</td>
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<td>Chronic kidney disease</td>
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High rates of treatable and preventable CV diseases risk factors in Navajo coal miners

1. Obesity (BMI > 30): 41%
2. Obstructive sleep apnea symptoms: 17%
   1. Poor concentration/inattention
   2. Errors and accidents (2-3x MVA rates)
3. High blood pressure: 38%
4. Current smoking: 7%
Implications and future directions

- Assure that miners with lung and heart disease get medical and preventive care and follow up (rehab, vax, meds, O2)

- Assure that miners with lung disease get the benefits they deserve

- Support efforts to limit coal mine dust exposure
Miners Clinic team/acknowledgements

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Questions?