The following “Health and Sanitation” material of the 80 Hour Underground Miner Pre-Employment Training Program was developed by the University of Connecticut, Division of Occupational Medicine, in conjunction with the West Virginia University Mining and Industrial Extension.

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All findings and conclusions are those of the authors and do not necessarily represent the views of the Foundation and any mention of a company, product does not constitute an endorsement of the Foundation.
Health and Sanitation

80 hour course for underground mining
Topic Areas to be covered:

1. Lung Disease and its Prevention
2. Injury and Musculoskeletal Diseases
3. Drugs Intoxicants and Alcohol
4. Hearing Loss and Hearing Protection
5. Lifestyle Factors and Cardiovascular Disease
Section I – Lung Disease and Prevention
Lung Cancer and Coal Mining

- West Virginia coal miners have higher rates of lung cancer than the national average
- The largest risk factor is smoking ~ 80-90%
- Silica dust is a possible carcinogen
- As much as half of the higher rate of lung cancer in West Virginia may be related to coal dust inhalation
- Dutch coal miners who don’t smoke and have good respiratory protection and dust suppression have no elevation of cancer risk
Lung cancer deaths and smoking

## Playing the Odds

<table>
<thead>
<tr>
<th>Age at Smoking Cessation</th>
<th>Odds of Dying from Lung Cancer at Specific Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>35</td>
</tr>
<tr>
<td>Never Started</td>
<td>0</td>
</tr>
<tr>
<td>Stopped at 35</td>
<td>0</td>
</tr>
<tr>
<td>Stopped at 45</td>
<td>--</td>
</tr>
<tr>
<td>Stopped at 55</td>
<td>--</td>
</tr>
<tr>
<td>Never Stopped</td>
<td>1 in 10,000</td>
</tr>
</tbody>
</table>

Coal Workers Pneumoconiosis (CWP)

- CWP is a large factor in respiratory decline but it is preventable
- Lung volume is about 5 liters or 5000 cc
- A miner who smokes and has CWP will lose about 100 cc/year
- A miner who has good dust control and does not smoke will lose 5 cc/year
Respiratory Symptoms and Function in young miners

Prevalence (%) of abnormal functional tests and respiratory symptoms

- Ensure that you follow-up on respiratory symptoms for x-ray and breathing tests are not enough

Types of Respiratory Protection

- Dust Filtering Face Mask
- Air helmet
- Cartridge Respirator
- Air Stream
# Respirators and Protection Factors

<table>
<thead>
<tr>
<th>TYPE</th>
<th>EXAMPLE</th>
<th>PF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Purifying</td>
<td>½ Face</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Full Face</td>
<td>50</td>
</tr>
<tr>
<td>Powered Air Purifying (PAPR)</td>
<td>Loose Fit (Airstream)</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>½ Mask</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Helmet/Hood</td>
<td>1000</td>
</tr>
<tr>
<td>Supplied Air</td>
<td>Continuous Flow</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>Pressure Demand</td>
<td>1000</td>
</tr>
<tr>
<td>Pressure Demand (Escape)</td>
<td>SCBA</td>
<td>10,000</td>
</tr>
</tbody>
</table>
Example of Spirometry
(Breathing Test)

Spirometry measures how fast and how much air you breathe out.
Progressive Massive Fibrosis (PMF)

Early Coal Workers Pneumoconiosis (CWP)

Silicosis
The x-ray presents a small part of the disease
Section II – Injury and musculoskeletal disease
Musculoskeletal diseases in mining are the most prevalent in any major occupational group.

Mining equipment is specialized, offering limited space to add interventions.

Some current safety approaches may aggravate hand-arm problems.


Common Sources of Knee Pain for Miners: Meniscus disorders and knee arthritis

• Frequency
  • Affects 6-24% of miners
  • 3-6 x higher than comparative light manufacturing

• Causes
  • Slips and fall (>50% of knee injuries)
  • Direct pressure from kneeling
  • Shear force (shoveling)

• Interventions
  • Selective mechanization (automatic roof bolting, tools for applying mesh)
  • Non-surgical management (braces, supports and analgesics)

Posture and Joint Loading

Mining has many awkward postures
Over time, there is wear and tear on joints
Facts about Knee Disease

• Most people exhibit few symptoms walking on level ground or at the start of walking from a standing position

• Pain usually occurs when climbing up stairs and standing up from a chair

• Findings on X-rays do not predict disease severity
  – People with abnormal X-rays often have no pain
  – Other times people with minimal findings on X-ray report severe pain
Facts about Knee Disease (Con’t)

• What to do:
  – NSAIDs (ibuprofen) work better than Tylenol
  – Be aware of injury as re-injury is a critical problem
  – Glucosamine, a nutritional supplement, does not hurt but probably does not help
  – Pain reduction may increase force on knee

• What to avoid:
  – When using knee pads be aware not to fasten them too tight as they could cut circulation to the leg
  – Limit dynamic load (carrying weight) while walking and while bent
  – Avoid adduction moment (see next slides)
Reducing Force on the Knee

Good posture

Carrying

Movements that push the knee laterally place extra forces on the knee

Section III – Drugs, intoxicants, and alcohol

**REMEMBER:** The currently approved WV Law on the following topics will always take precedence over the slides in this presentation.
Part A: Drugs and Alcohol Affect Every Miner’s Safety

MSHA says:

“The goal of a drug and alcohol policy is to create a safer, healthier mine for you and for your fellow miners. Its purpose is to protect, not punish.

The idea is to prevent alcohol and drug use and encourage people to voluntarily seek help for alcohol and drug problems BEFORE their behavior becomes a safety hazard.”

www.msha.gov/DrugFree/AlcoholDrugFreeMinesSamplePolicyand0Tr
The science behind these policies is clear

Studies on the effects of alcohol have shown impairment at low Blood Alcohol Concentration (BAC) levels:

- *All driving-related skills* showed impairment by .07 BAC.
- In studies examining divided attention, vigilance, and simulated piloting, *73 percent of the tests showed impairment by .039 BAC.*

The take-away - Skill and judgment are impaired at very low BAC.

Observations on drug and alcohol use and injury at work

• Drug use has increased in the younger work force

• Every year, miners are hurt because their reactions are slowed by drugs or alcohol

• Even two drinks can cause dehydration or fatigue which reduce performance and impair judgment

• **Worse yet**, fellow miners are injured or killed by abusers.
Effect of Blood Alcohol Concentration (BAC) on tasks

BAC AND AREAS OF IMPAIRMENT

.08 concentrated attention, speed control
.07
.06
information processing, judgment
.05
.04 coordination
eye movement control, standing steadiness, emergency responses
.03 .02 tracking and steering divided attention, choice reaction time, visual function
.01

www.ct.gov/dmv/cwp/view.asp?a=813&q=249562
Did you know?

• One drink is defined as:
  – One shot, 1.25 oz., of 80 proof liquor (vodka, scotch),
  – or 12 oz. of beer,
  – or 5 oz. of wine

• *They all have about the same alcohol content and effect on the body*
## Approximate Blood Alcohol Percentage - Males

<table>
<thead>
<tr>
<th>Drinks in 1 hour</th>
<th>Body Weight in Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>140</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0.03</td>
</tr>
<tr>
<td>2</td>
<td>0.05</td>
</tr>
<tr>
<td>3</td>
<td>0.08</td>
</tr>
<tr>
<td>4</td>
<td>0.11</td>
</tr>
<tr>
<td>5</td>
<td>0.13</td>
</tr>
</tbody>
</table>

- **Only Safe Driving Limit**
- **Impairment Begins**
- **Driving Skills Affect Possible Criminal Penalties**
- **Legally Intoxicated Criminal Penalties**

From Pennsylvania Liquor Control Board
## Approximate Blood Alcohol Percentage - Females

<table>
<thead>
<tr>
<th>Drinks in 1 hour</th>
<th>Body Weight in Pounds</th>
<th>Only Safe Driving Limit</th>
<th>Impairment Begins</th>
<th>Driving Skills Affect Possible Criminal Penalties</th>
<th>Legally Intoxicated Criminal Penalties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>120</td>
<td>140</td>
<td>160</td>
<td>180</td>
</tr>
<tr>
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</tr>
<tr>
<td>1</td>
<td>0.05</td>
<td>0.04</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>2</td>
<td>0.09</td>
<td>0.08</td>
<td>0.07</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>3</td>
<td>0.14</td>
<td>0.11</td>
<td>0.1</td>
<td>0.09</td>
<td>0.08</td>
</tr>
<tr>
<td>4</td>
<td>0.18</td>
<td>0.15</td>
<td>0.13</td>
<td>0.11</td>
<td>0.1</td>
</tr>
<tr>
<td>5</td>
<td>0.23</td>
<td>0.19</td>
<td>0.16</td>
<td>0.14</td>
<td>0.13</td>
</tr>
</tbody>
</table>

From Pennsylvania Liquor Control Board
Take note

- For *drivers*, the legal BAC limit is .08

- But for *miners*, the legal BAC limit is .039 for mining

- Most miners will risk decertification *after their first drink*
How long are alcohol and drugs in your system

- Alcohol can go through your system in about 24 hours

- Certain drugs will stay in your body for as long as 30 days and they are entirely detectable

- The next 2 slides show how long drugs and alcohol are detectable in your body
# Approximate detection periods

<table>
<thead>
<tr>
<th>Substance</th>
<th>Urine</th>
<th>Hair</th>
<th>Blood / Oral Fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>6–24 hours</td>
<td>up to 2 days</td>
<td>12–24 hours</td>
</tr>
<tr>
<td>Note: Alcohol tests may measure EtG which can stay in urine for up to 80 hours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotinine (a break-down product of nicotine)</td>
<td>2 to 4 days</td>
<td>up to 90 days</td>
<td>2 to 4 days</td>
</tr>
<tr>
<td>Amphetamines (except methamphetamine)</td>
<td>1 to 5 days</td>
<td>up to 90 days</td>
<td>12 hours</td>
</tr>
<tr>
<td>Methamphetamine</td>
<td>3 to 5 days</td>
<td>up to 90 days</td>
<td>1–3 days</td>
</tr>
<tr>
<td>MDMA (Ecstasy)</td>
<td>72 hours</td>
<td>up to 90 days</td>
<td>24 hours</td>
</tr>
<tr>
<td>Barbiturates (except phenobarbital)</td>
<td>1 day</td>
<td>up to 90 days</td>
<td>1 to 2 days</td>
</tr>
<tr>
<td>Phenobarbital</td>
<td>2 to 3 weeks</td>
<td>up to 90 days</td>
<td>4 to 7 days</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Therapeutic use: up to 7 days</td>
<td></td>
<td></td>
<td>6 to 48 hours</td>
</tr>
<tr>
<td>Chronic use (over one year): 4 to 6 weeks</td>
<td>up to 90 days</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Approximate detection periods

<table>
<thead>
<tr>
<th>Substance</th>
<th>Urine</th>
<th>Hair</th>
<th>Blood / Oral Fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannabis</td>
<td>2 to 7 days, up to &gt;30 days</td>
<td>up to 90 days</td>
<td>2–3 days in blood, up to 2 weeks in blood of heavy users. However, it depends on whether actual THC or THC metabolites are being tested for, the latter having a much longer detection time than the former. THC (found in marijuana) may only be detectable in saliva/oral fluid for 2–24 hours in most cases.</td>
</tr>
<tr>
<td>Cannabis</td>
<td>after heavy use and/or in users with high body fat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cocaine</td>
<td>2 to 5 days with exceptions for certain kidney disorders</td>
<td>up to 90 days</td>
<td>2 to 5 days</td>
</tr>
<tr>
<td>Codeine</td>
<td>2 to 3 days</td>
<td>90 days</td>
<td>&lt;1 day</td>
</tr>
<tr>
<td>Morphine</td>
<td>2 to 4 days</td>
<td>up to 90 days</td>
<td>1 – 3 days</td>
</tr>
<tr>
<td>Heroin</td>
<td>1 to 4 days</td>
<td>up to 90 days</td>
<td>1– 2 days</td>
</tr>
<tr>
<td>LSD</td>
<td>12 to 24 hours</td>
<td>Undetectable</td>
<td>2 to 4 days</td>
</tr>
<tr>
<td>Methadone</td>
<td>3 days</td>
<td>up to 97 days</td>
<td>24 hours</td>
</tr>
<tr>
<td>PCP</td>
<td>3 to 7 days for single use; up to 30 days in chronic users</td>
<td>up to 90 days</td>
<td>1 to 3 days</td>
</tr>
</tbody>
</table>
High Energy Drink (HED) and the Heart

- HEDs
  - are fairly new products and not a lot is known about their long term affects on the body
  - caffeine content varies greatly by brand from 1-3 times as much as an 8oz. cup of coffee*
  - they also contain glucose and taurine

But unlike the caffeine in coffee, HEDs additional ingredients, glucose and taurine, can cause increased heart contractibility which places increased stress on the heart.**

This means your heart is doing more work than it needs which may cause problems.

** http://www.webmd.com/hypertension-high-blood-pressure/news/20131202/energy-drinks-affect-heart-mri-scans-show
Compounding effects

• A German study conducted by Dr. Jonas Dorner pointed out the amount of caffeine is typically up to three times higher in energy drinks than in other drinks like coffee or cola, and high intake of caffeine may trigger rapid heart rate, palpitations, rises in blood pressure and in severe cases, seizures or sudden death.*

• Effects are compounded by drugs or alcohol

* http://www.webmd.com/hypertension-high-blood-pressure/news/20131202/energy-drinks-affect-heart-mri-scans-show
A study by *Consumer Reports* tested 27 popular energy drinks.*

- Eleven didn't list the amount of caffeine on the label
- Among the 16 products that did:
  - five had more than 20% caffeine than the label claimed

With little or no regulation, the amounts of caffeine and other ingredients in these drinks are essentially unknown

How much caffeine am I drinking?

• The average serving of coffee has about 100 mg of caffeine

• The same *Consumer Reports* tests showed seven HEDs with *more than twice* that amount of caffeine, although the label didn’t indicate amounts
HEDs and Insomnia

• HEDs are also linked to insomnia
• Even at work, a tired body will try to get rest
• This means that you may be less likely to detect hazards
• Disruptive sleep causes added stress to the body including decreased mental function, increases in blood pressure, irritability, and decreased work capacity.
HED Wrap Up

• HEDs can cause irregularities to your heartbeat (prolonged contractibility)
• HEDs labels don’t tell you what’s inside, much less how much caffeine is involved
• They are not regulated well
• For sensitive people, they can cause rapid heart rate, palpitations, rises in blood pressure and in severe cases, seizures or sudden death*

* http://www.webmd.com/hypertension-high-blood-pressure/news/20131202/energy-drinks-affect-heart-mri-scans-show
Part B: What the Apprentice Miner Needs to Know

West Virginia Drug and Alcohol Policies
Substance abuse is not a new topic

- Every year, miners are hurt because their reactions are slowed by drugs or alcohol
- Their ability to predict hazards is reduced
- Worse, yet, fellow miners are injured or killed by abusers.
West Virginia has problems with substance abuse just like every other state

• But now, the Legislature, the Industry, the Union and the Office of Miners’ Health Safety and Training are taking a stronger approach to abuse than in the past. In fact, much stronger

• Miners need to know about these new rules
The State is decertifying miners now

• By the end of 2014, the State will have decertified about 600 miners for violating the state’s new drug and alcohol policy

• Protect yourself, protect your career and protect those around you:
  – Know the rules
The policies in everyday language

- **Pre-employment testing** means that all miners will be tested for substance abuse prior to starting work.

- New miners should know that they can be called for a drug and alcohol test as soon as a day after passing the 40 or 80 hour certification test.

WV Title 56, Series 19. Effective May 10, 2014
Here’s what this really means

• A miner might be certified one day, and be called for pre-employment testing on short notice, even the next day

• A miner must be **drug free**
Here are some definitions all miners need to know

They come from the May 10, 2014 “Rules Governing Substance Abuse Screening: Standards and Procedures”
“Safety-Sensitive position”

• Means that the person’s job responsibilities include duties and activities that involve the personal safety of the employee or others at the mine.

• This is pretty much everyone on the mine site.
“Safety-Sensitive” continued:

• If you fail a drug or alcohol test, you will lose your “safety sensitive” card;
• you lose ALL certifications including your apprenticeship miners card and...
• you cannot go on mine property
“Serious Accident”

• Means “an accident where bodily injury requires the individual to be admitted to a medical facility overnight for reasons other than strains, sprains or observation as determined by a physician”
In a “Serious Accident”

• If you are in a serious accident, you will be tested

• If you are even involved in the accident, you will be tested
“Random Testing”

• Means that each person has an equal chance of being tested at random and unscheduled times

• Each year, at least 25 percent of miners must be randomly tested for substance abuse

• This occurs at least 4 times per year
“Split Sample”

• Means that part of a urine specimen is sent on to a second lab in the event that an employee requests it to be tested following a verified positive test of the primary specimen.

• A lab and a doctor are involved
Something to know

• If you have an expired prescription, you may **not** take that medicine until the prescription is renewed
• You can’t take your wife’s or your friend’s prescription
• Otherwise you risk decertification for taking unlawful medicine(s)
A miner who fails the drug/alcohol test in West Virginia

• Automatically fails in States that have reciprocity with WV
  – For example, Kentucky or other States with reciprocity agreements with West Virginia
Some other things to know

• A refusal to take the test means automatic decertification for a minimum of nine (9) months

• A second refusal (or fail) means permanent decertification; you can never work in West Virginia’s mines again and any other state with an agreement with West Virginia
Employers must test urine for at least the following ten substances:

- Amphetamines
- Cannabinoids (THC)
- Cocaine
- Opiates
- Phencyclidine (PCP)
- Benzodiazepines
- Propoxyphene
- Methadone
- Barbiturates
- Synthetic narcotics including bath salts and others

There is also a breath test for alcohol
And even though we already said this, it is very important:

• An employer must:
  – Randomly test at least 25 per cent of miners
  – Test at least 4 times per year
  – Test any miner who is “accident-involved”

• The likelihood is that a user will get caught
Miners will face immediate suspension if:

- They test positive for drugs
- They test positive for alcohol
- They possess an adulterated specimen or if they submit an adulterated specimen
- They possess a substituted specimen or if they submit a substituted specimen
- The miner refuses to submit to a drug or alcohol test

Don’t forget that an employer can require a test at any time for “reasonable suspicion”
The miner may appeal a suspension

• Within 30 days of the notice of suspension or revocation
• By requesting a hearing by the Board of Appeals
• A miner can then get all of his cards back
A miner under suspension may agree to a treatment plan

- The actual legal document that you would sign runs to five pages - here is part of page 1

WEST VIRGINIA COAL MINE SAFETY BOARD OF APPEALS
IN THE MATTER OF:
WEST VIRGINIA OFFICE OF MINERS’ HEALTH, SAFETY AND TRAINING,
Petitioner,
v.
Respondent.
SUBSTANCE ABUSE TREATMENT AGREEMENT
Comes now the West Virginia Office of Miners’ Health, Safety and Training (OMHST), by counsel, Barry L. Koerber, Assistant Attorney General and ---------, pro se, (hereinafter referred to as the Parties) and set forth the terms and conditions of this Substance Abuse Treatment Agreement (Treatment Agreement) containing the understanding of the Parties with respect to the resolution of the above-styled
The treatment agreement says basically this:

- The miner must agree and admit that he violated his employer’s substance abuse screening policy program
- All certifications are *immediately* suspended
- The miner is *required* to attend substance abuse counseling and treatment
- The miner must comply with applicable laws and rules—violation of the treatment plan results in revocation of certifications for at least three (3) years
There is more to the treatment plan

- The miner will submit samples regularly
- A test failure may result in permanent revocation
- All costs are paid by the miner
- The miner will submit to drug and alcohol testing at least every 30 days, or more often if required by the counselor.
- There will be a permanent record made of all transactions in the treatment plan
To summarize:

• The new rules are designed to protect miners’ safety, not to punish them

• The rules are complicated

• The rules are serious
  – A second failure will result in **PERMANENT REVOCATION of ALL certifications**

• Company policies may exceed the minimum requirements discussed

• Breaking the rules can impact a miner’s career and even bar him from future employment

...why take the risk of ruining a career?
Section IV - Noise Exposure and Effects on Hearing and Health
Consequences of Exposure to Noise

• Immediate short-term effects may involve:
  - temporary hearing loss
  - ringing in, or “dullness” of, the ears (tinnitus)
  - difficulty understanding speech
  - difficulty hearing sounds around you (e.g., warnings)
  - stress, and fatigue

• Persistent long-term effects may include:
  - hearing loss & tinnitus
  - reduced ability to understand speech
  - reduced ability to hear all sounds
  - cardiovascular disease
Photomicrographs of normal hairs and hair cells in the inner ear damaged by noise, causing hearing loss (plan views below)
Percentage of US miners with hearing loss as a function of age showing almost 80% have mild hearing loss, >25dB, by age 60

Noise exposure data for mining occupations showing the percentage of samples that exceeded the threshold for affecting hearing (>80 dBA), and the percentage that exceeded the threshold for causing substantial hearing loss (>90 dBA)

<table>
<thead>
<tr>
<th>Occupation</th>
<th># of Samples</th>
<th>90-dBA threshold</th>
<th>80-dBA threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>% of samples &gt;90 dBA(PEL)</td>
<td>% of samples &gt;80 dBA(PEL)</td>
</tr>
<tr>
<td>Continuous Miner Helper</td>
<td>68</td>
<td>33.8</td>
<td>88.2</td>
</tr>
<tr>
<td>Continuous Miner Operator</td>
<td>262</td>
<td>49.6</td>
<td>96.2</td>
</tr>
<tr>
<td>Roof Bolt Operator (single)</td>
<td>234</td>
<td>21.8</td>
<td>85.5</td>
</tr>
<tr>
<td>Roof Bolt Operator (twin)</td>
<td>92</td>
<td>31.5</td>
<td>98.9</td>
</tr>
<tr>
<td>Shuttle Car Operator</td>
<td>260</td>
<td>13.5</td>
<td>78.5</td>
</tr>
<tr>
<td>Scoop Car Operator</td>
<td>94</td>
<td>18.1</td>
<td>74.5</td>
</tr>
<tr>
<td>Cutting Machine Operator</td>
<td>22</td>
<td>36.4</td>
<td>63.6</td>
</tr>
<tr>
<td>Headgate Operator</td>
<td>20</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Longwall Operator</td>
<td>34</td>
<td>70.6</td>
<td>100</td>
</tr>
<tr>
<td>Jack Setter (longwall)</td>
<td>25</td>
<td>23</td>
<td>68</td>
</tr>
<tr>
<td>Cleaning Plant Operator</td>
<td>107</td>
<td>36.4</td>
<td>77.6</td>
</tr>
<tr>
<td>Bulldozer Operator</td>
<td>225</td>
<td>48.9</td>
<td>94.2</td>
</tr>
<tr>
<td>Fron-end-Loader Operator</td>
<td>244</td>
<td>16</td>
<td>76.6</td>
</tr>
<tr>
<td>High-wall Drill Operator</td>
<td>83</td>
<td>21.7</td>
<td>77.1</td>
</tr>
<tr>
<td>Refuse/Backfill Truck Driver</td>
<td>162</td>
<td>13.6</td>
<td>78.4</td>
</tr>
<tr>
<td>Coal Truck Driver</td>
<td>28</td>
<td>17.9</td>
<td>64.3</td>
</tr>
</tbody>
</table>

How can you tell if your hearing is affected?

- Do you turn up the volume on your car radio/music player/cell phone/TV after work, or turn down the volume in the morning?

- Do you have difficulty understanding what people are saying when you are at a noisy restaurant/bar/diner/concert/party?

- Do you have ringing or buzzing sounds in your ears?

If you answer yes to any of these questions, then it is likely your hearing has been affected. There could be many causes including noise exposure, medications and lifestyle.
What can be done?

At work
- Reduce the noise of machines and machinery
- Change work practices and/or adjust schedules to reduce exposure to noisy situations
- Wear hearing protection (muffs or plugs)

While the first two items may not be within your control as a miner, wearing hearing protection is. (See next slide)

You can decrease your noise exposure by simply moving further away from the source, if possible. For example, standing 5 ft from a 96dBA noise source is hazardous but if you can increase your distance to 20ft the noise drops to 84dBA.*

Hearing Protection

Types:

– Earplugs
  • Fit inside the ear canal
  • To be effective, need to total block the canal and create an airtight seal
  • Dirty or worn-out plugs will not seal the canal and may irritate it

– Earmuffs
  • Fit over the ear
  • Do not fit properly over glasses or long hair

Both types are equally effective. Using them together increases protection against high noise levels, over 105dBA. You should choose the hearing protection that is the most convenient, compatible and comfortable for you.

What can be done?

Away from work:

• Reduce noise exposure (as it adds to the effect of exposure at work)
  – Wear hearing protection when working around your home, e.g., using chainsaws, weed whackers, tractors, or mowing the lawn.
  – Wear hearing protection when participating in noisy hobbies such as shooting or hunting, motorcycling, wood working, or attending loud concerts or bars.
  – Guns and chain saws produce noise in excess of 100 dBA, motorcycles and snowmobiles in excess of 90 dBA, and power tools for garden or woodworking in excess of 80 dBA.

• Avoid excessive alcohol consumption, or smoking

• Pay attention to heart health to reduce the cardiovascular effects of noise (e.g., diet, exercise)
Section V – Lifestyle factors and cardiovascular disease
The importance of a health heart:

It is not just being a miner in West Virginia. Americans have the worst health in the industrial world and it is getting worse.

Male life expectancy at birth relative to 21 other high-income countries, 1980-2006

Red circles depict newborn life expectancy in the United States. Grey circles depict life expectancy values for Australia, Austria, Belgium, Canada, Denmark, Finland, France, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and West Germany.

SOURCE: National Research Council (2011)
The issue is health care disparities not mining, alone.
Whole Health Considerations:

• At 25 or 35 you are not a heart attack waiting to happen

• What you do for next 10-20 years can determine if you become a young old or an old young

• Between ages 25 - 55, the risk of a heart attack or a stroke goes up 10 times

• A 25 year old who smokes, has high blood pressure and high cholesterol has a 1 in 70 chance of having a heart attack or stroke by age 35

• At age 55, his or her odds are 1 in 8 (12.5%). They are almost 1 in 2 (50%) if you add in diabetes

• At 55, if you don’t smoke, control your blood pressure and your cholesterol and fats and are not diabetic, the odds are no higher than 1 in 50 (<2%)
Health Exposures Contributing to Heart Disease

- Noise
- Vibration
- Heat
- Diesel Exhaust
- Silica
- Coal Dust
- Carbon Monoxide

Stress
Sleep, shiftwork

Lifestyle Factors
- Smoking
- Nutrition
- Leisure Exercise

Biometric Factors
- ↑Blood Pressure
- ↑Cholesterol

Cardiovascular Response

- Blood Pressure
- Cholesterol
Reducing Risk Factors Between Ages 25 and 55 to cardiac event

Chronic Diseases do not appear at a young age, but the process is in motion. Controlling blood lipids, blood pressure, blood sugar, and not smoking can make cardiac risks very small.

Parting Thoughts

• An apprentice miner who has suitable protection against exposures at work and takes preventive health measures outside of work will live as long as the general US population.

• Good dust control and selective use of respiratory protection can eliminate loss of lung function later in life.

• Abuse of substances are easily detected with existing required screening and can lead to lifetime loss of employment in mining.

• Passive routine health and lung checks may not be enough. Active participation in health and safety and knowledge are the extra mile.