A Portrait of a long-haul truck driver...

Descriptive data analysis of a large population of the U.S. truck drivers
Impact of the health issues in truck drivers on the society

- Nearly 15 million truck drivers (Saltzman & Belzer, 2007)
- Truckers remain both a highly vulnerable and a seriously underserved working population with the high prevalence of chronic health problems
- Low health care access and use (Layne, Rogers, & Randolph, 2009; Reed & Skeeters Cronin, 2003; Solomon, Doucette, Garland, & McGinn, 2004)
Commercial Driver Medical Qualification

- The Motor Carrier Safety Act of 1935 granted the Interstate Commerce Commission (ICC) the authority to require medical certifications for CMV operators but not physical examinations.

- A physical examination and Certificate of Physical Evaluation were not required until January 1, 1954.

- The U.S. Department of Transportation (DOT) was created by an act of Congress in 1970.
  - Since October 1999, motor carrier safety was transferred to the FMCSA which reports directly to the secretary of the DOT.
Commercial Driver Medical Qualification

- Initial criteria from June 7, 1939:
  - Good physical and mental health
  - Good eyesight
  - Adequate hearing
  - No addiction to narcotic drugs
  - No excessive use of alcoholic beverages or liquors

- Tighter medical qualification standards were announced 30 years later, on June 7, 1969

- New form was proposed in 1998 and the Final Rule was published on October 5, 2000
Medical Examination Report form

• The form includes one page each for:
  – Medical history
  – Testing
  – Recording of the physical examination
• Instructions to examiners, the role of the commercial driver, and inclusion of the advisory criteria bring the entire document to eight pages
Problems with the form

- Over 15% were incomplete
- Over 40% had entries that were not legible
- Data storage
- Drivers, who did not meet the regulations and medical guidelines, were given DOT certificates
- Previous DOT exam information not available for review
- Drivers did not always give consistent information from one exam to the next
# DOT form

## Medical Examination Report

**FOR COMMERCIAL DRIVER FITNESS DETERMINATION**

### 1. Driver's Information
- **Name:** John Wayne
- **Social Security No.:** 855-22-1133
- **Medical Expiration Date:** 10/06/07
- **MedicalExaminer’s No.:** M1208373 Display

### 2. Health History

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Any illness or injury in the last year?</em></td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><em>Heart problems; Heart disease, heart failure, heart attack, heart valve problem</em></td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><em>Diabetes or related blood sugar problem controlled by diet or medication</em></td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><em>Any injury by gunshot, stabbing, poisoning,溺死, or any other injury or disease that caused permanent disability</em></td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><em>Seizures or convulsions</em></td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><em>High blood pressure or high blood pressure medication</em></td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><em>Lesion of the brain</em></td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><em>Loss of, or altered consciousness</em></td>
<td>☐</td>
<td>☑</td>
</tr>
</tbody>
</table>

### Certification

I certify that the above information is complete and true. Understating, misrepresenting, false, or missing information may invalidate the examination and my Medical Examiner's Certificate.

**Signature:** [Signature]

**Date:** 10/06/07

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**Medical Examiner’s Comments on Health History:** The medical examiner must review and discuss with the driver any 'yes' answers and potential hazards of medications, including over-the-counter medications, while driving.

**Medical Examiner’s Vote:** [Signature]
### TESTING (Medical Examiner completes Section 3 through 7)

#### VISION

**STANDARDS:** At least 20/40 acuity (Snellen) in each eye with or without correction. At least 70% peripheral vision in horizontal meridian measured in each eye. The use of corrective lenses should be noted on the Medical Examiner's Certificate.

**INSTRUCTIONS:** When other than the Snellen chart is used, give test results in the Snellen-comparable values. In recording distance vision, use 20ft as normal. Report visual acuity as a ratio with 20 as numerator and the smallest type read as denominator. If the applicant wears corrective lenses, these should be worn while visual acuity is being tested. If the driver habitually wears contact lenses, or intends to do so while driving, sufficient evidence of good tolerance and adaptation to their use must be obvious. Monocular drivers are not qualified.

**Numerical readings must be provided.**

<table>
<thead>
<tr>
<th>ACuity</th>
<th>UNCORRECTED</th>
<th>CORRECTED</th>
<th>HORIZONTAL FIELD OF VISION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Eye</td>
<td>20/30</td>
<td>20/20</td>
<td>-</td>
</tr>
<tr>
<td>Left Eye</td>
<td>20/30</td>
<td>20/20</td>
<td>-</td>
</tr>
<tr>
<td>Both Eyes</td>
<td>20/20</td>
<td>20/20</td>
<td>-</td>
</tr>
</tbody>
</table>

**Applicant can recognize and distinguish among traffic control signals and devices showing standard red, green, and amber colors?** □ Yes □ No

**Applicant meets visual acuity requirement only when wearing:** □ Corrective Lenses

**Monocular Vision:** □ Yes □ No

Complete examination only if vision testing is done by an ophthalmologist or optometrist.

#### HEARING

**STANDARDS:** a) Must first person be able to hear the spoken voice > 5 ft., with or without hearing aid, or b) average hearing loss is better ear ≤ 40 dB

**INSTRUCTIONS:** To cover audiometric test results from ISO to ANSI, add 4 dB from ISO to ANSI for 200 Hz, -10 dB for 1,000 Hz, -15 dB for 2,500 Hz. To average, add the readings for 3 frequencies tested and divide by 3.

**Numerical readings must be recorded.**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Right Ear</th>
<th>Left Ear</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 Hz</td>
<td>1000 Hz</td>
<td>2000 Hz</td>
</tr>
<tr>
<td>500 Hz</td>
<td>1000 Hz</td>
<td>2000 Hz</td>
</tr>
</tbody>
</table>

**Average:**

#### BLOOD PRESSURE / PULSE RATE

**Numerical readings must be recorded.**

<table>
<thead>
<tr>
<th>Blood Pressure</th>
<th>Systolic</th>
<th>Diastolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertensive</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Hypotensive</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pulse Rate</th>
<th>Regular</th>
<th>Irregular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood test</td>
<td>140/90-99</td>
<td></td>
</tr>
</tbody>
</table>

**RECORDING**

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>EXPIRATION DATE</th>
<th>RECERTIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>1 year</td>
<td>1 year if &lt; 40/90</td>
</tr>
<tr>
<td>Stage 2</td>
<td>6 months from date of exam if &lt; 60/100</td>
<td></td>
</tr>
</tbody>
</table>

**Medical examiner should take at least 2 readings to confirm blood pressure.**

#### LABORATORY AND OTHER TEST FINDINGS

**Numerical readings must be recorded.**

- Urine: Specimen
  - SG: [value]
  - Protein: [value]
  - Blood: [value]
  - Sugar: [value]

**Other Testing:**

- Urinalysis is required. Positive blood or sugar in this urine may be an indication for further testing to rule out any underlying medical problem.

- Other Testing (Describe and record):
7. PHYSICAL EXAMINATION

The presence of a certain condition may not necessarily disqualify a driver, particularly if the condition is controlled adequately, is not likely to worsen or is readily amenable to treatment. Even if a condition does not disqualify a driver, the medical examiner may consider deferring the driver temporarily. Also, the driver should be advised to take the necessary steps to correct the condition as soon as possible particularly if the condition, if neglected, could result in more serious illness that might affect driving.

Check YES if there are any abnormalities. Check NO if the body system is normal. Discuss any YES answers in detail in the space below, and indicate whether it would affect the driver's ability to operate a commercial motor vehicle safely. Enter applicable item number before each comment. If organic disease is present, note that it has been compensated for.

See Instructions to the Medical Examiner for guidance.

<table>
<thead>
<tr>
<th>BODY SYSTEM</th>
<th>CHECK FOR:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General Appearance</td>
<td>Marked overweight, tremor, signs of alcoholism, problem drinking, or drug abuse.</td>
</tr>
<tr>
<td>2. Eyes</td>
<td>Papillary edema, reaction to light, accommodation, ocular mobility, corneal edema, extra-ocular movements, photophobia, mydriasis, anisocoria uncorrected by corrective lenses, retinopathy, cataracts, glaucoma, macular degeneration.</td>
</tr>
<tr>
<td>3. Ear</td>
<td>Middle ear disease, occlusion of external canal, perforated eardrum.</td>
</tr>
<tr>
<td>4. Mouth and Throat</td>
<td>Inframandibular deformities likely to interfere with breathing or swallowing.</td>
</tr>
<tr>
<td>5. Heart</td>
<td>Murmurs, extra sounds, enlarged heart, pericarditis.</td>
</tr>
<tr>
<td>6. Lungs and chest, not including breast examination</td>
<td>Absent chest wall expansion, abnormal respiratory rate, abnormal breath sounds including wheezes or rhonchi, rales, impaired respiratory function, dyspnea, and cyanosis. Abnormal findings on physical exam may require further testing such as pulmonary test and/or x-ray of chest.</td>
</tr>
</tbody>
</table>

COMMENTS:

Note certification status here. See Instructions to the Medical Examiner for guidance.

☐ Meets standards in 49 CFR 391.41; qualifies for 2 year certificate
☐ Does not meet standards
☐ Meets standards, but periodic evaluation required
Due to:
☐ 3 months
☐ 1 year
☐ 6 months
☐ Other

☐ Temporarily disqualified due to (condition or medication):

Return to medical examiner's office for follow up on
If meets standards, complete a Medical Examiner's Certificate according to 49 CFR 391.43(b). (Driver must carry certificate when operating a commercial vehicle.)
Methods

- Web-based network of provider clinics was established
- DOT physicals done electronically
- 100% completion rate (DOT certificate can’t be issued if the form is incomplete)
- The data is entered into, stored, and analyzed using web-based Road Ready applications
Electronic version of the form

The presence of a certain condition may not necessarily disqualify a driver, particularly if the condition is controlled adequately, is not likely to worsen or is readily amenable to treatment. Even if a condition does not disqualify a driver, the medical examiner may consider delaying the driver temporarily. Also, the driver should be advised to take the necessary steps to correct the condition as soon as possible particularly if the condition, if neglected, could result in more serious illness that might affect driving.

Check **YES** if there are any abnormalities. Check **NO** if the body system is normal. Discuss any **YES** answers in detail in the space below, and indicate, whether it would affect the driver’s ability to operate a commercial motor vehicle safely. Enter applicable item number before each comment. If organic disease is present, note that it has been compensated for. See Instructions to the Medical Examiner for guidance.

<table>
<thead>
<tr>
<th>Body System</th>
<th>Yes</th>
<th>No</th>
<th>Body System</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Appearance</td>
<td></td>
<td></td>
<td>Abdomen and Viscera</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eyes</td>
<td></td>
<td></td>
<td>Vascular system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ears</td>
<td></td>
<td></td>
<td>Genito.urinary system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mouth and Throat</td>
<td></td>
<td></td>
<td>Extremities - Limb impaired. Driver may be subject to SPE certificate if otherwise qualified.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart</td>
<td></td>
<td></td>
<td>Spine, other musculoskeletal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lung and chest, not including breast examination</td>
<td></td>
<td></td>
<td>Neurological</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Check for:
- Marked overweight, tremor, signs of alcoholism, problem drinking, or drug abuse.

Comments
Demographics

- Age - 20-89 in Road Ready database (avg.43.23)
- Average Age of the U.S. Labor Force and of Truck Drivers in the Transportation Industry
Gender and habits

• Male drivers >95%
• Female drivers <5%

• Estimated prevalence of smoking in truck drivers is 50.1%
• Nutrition/Diet: needs may be met at roadside diners
• Exercises: inadequate
• Often spend days to weeks away from home
• Poor sleep habits
# Body Mass Index Analysis

<table>
<thead>
<tr>
<th>Age Group (Years)</th>
<th>≤25 Normal Range</th>
<th>26-29 Overweight</th>
<th>30-34 Obese</th>
<th>35-39 Severely Obese</th>
<th>≥40 Morbidly Obese</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>0.00% 0</td>
<td>0.00% 0</td>
<td>0.00% 0</td>
<td>0.00% 0</td>
<td>0.00% 0</td>
<td>0.00% 0</td>
</tr>
<tr>
<td>20-29</td>
<td>27.72% 1953</td>
<td>26.84% 1891</td>
<td>19.32% 1361</td>
<td>12.84% 905</td>
<td>13.28% 936</td>
<td>10.71% 7046</td>
</tr>
<tr>
<td>30-39</td>
<td>18.95% 3541</td>
<td>29.43% 5498</td>
<td>24.61% 4599</td>
<td>13.71% 2562</td>
<td>13.29% 2484</td>
<td>28.41% 18,684</td>
</tr>
<tr>
<td>40-49</td>
<td>15.77% 342</td>
<td>31.55% 6685</td>
<td>26.72% 5662</td>
<td>14.19% 3007</td>
<td>11.76% 2492</td>
<td>32.22% 21,188</td>
</tr>
<tr>
<td>50-59</td>
<td>15.94% 2274</td>
<td>33.69% 4806</td>
<td>27.68% 3948</td>
<td>13.05% 1862</td>
<td>9.63% 1374</td>
<td>21.69% 14,264</td>
</tr>
<tr>
<td>60-69</td>
<td>15.65% 652</td>
<td>35.56% 1481</td>
<td>28.45% 1185</td>
<td>13.28% 553</td>
<td>7.06% 294</td>
<td>6.33% 4165</td>
</tr>
<tr>
<td>70-79</td>
<td>19.13% 75</td>
<td>37.76% 148</td>
<td>26.02% 102</td>
<td>12.24% 48</td>
<td>4.85% 19</td>
<td>0.60% 392</td>
</tr>
<tr>
<td>80-89</td>
<td>0.00% 0</td>
<td>50.00% 11</td>
<td>36.36% 8</td>
<td>13.64% 3</td>
<td>0.00% 0</td>
<td>0.03% 22</td>
</tr>
<tr>
<td>ALL</td>
<td>18.01% 1,842</td>
<td>31.2% 20,520</td>
<td>25.64% 16,865</td>
<td>13.59% 8,940</td>
<td>11.55% 7,599</td>
<td>100% 65,766</td>
</tr>
</tbody>
</table>
Effect of BMI on Lifetime DM Risk

- Overweight and especially obesity substantially increases lifetime risk of diagnosed diabetes
- There is a 37-1/2% lifetime risk for diabetes in the obese individual, BMI 30-35 (Diabetes Care 30:1562–1566, 2007)
- There is a 50.5% lifetime risk for diabetes in the very obese individual, greater than 35 BMI (Diabetes Care 30:1562–1566, 2007)

- Estimated lifetime prevalence of DM in our research population is 26%
- Self-reported rate of diabetes is 6.9%
DM and DOT physicals

- Screening for diabetes – urine dipstick
- Blood glucose or HbA1C – not required
- Health history – limited, esp. with paper form
- Current standards – lacking
- Drivers awareness – poor
- Motor carriers are forced to fill the gap
Sleep apnea

• Obstructive sleep apnea (OSA) is a significant cause of motor vehicle crashes resulting in two-to-sevenfold increased risk.

• It is reported that 50-60% of drivers need to be screened for sleep apnea and about 25% of the driver population have sleep apnea (MCSAC and MRB Task 11-05: Recommendations for OSA Regulatory Guidance).

• The rate of drivers who answered “Yes” to a sleep disorder, pauses in breathing while asleep, daytime sleepiness, or loud snoring, was 0.6% in RoadReady database.
HTN and CAD

• Self-reported rate of HTN in Road Ready database was 14.57%
• Self-reported rate of heart disease was 1.8%
• Self-reported rate of heart surgery was 1.15%
• We know that the actual burden of CVD is much higher in this population
Conclusions

• It’s been speculated that truck drivers have a 10-to 15-year lower life expectancy than the average American male who lives to age 76
• We see in our database that truck drivers are getting older
• Morbid obesity is prevalent in this population
• They underreport and we underestimate prevalence of chronic health problems in truck drivers: CAD, DM, HTN, OSA, etc.
Conclusions

• This is a wake up call for truckers, healthcare providers, insurance industry, public health professionals

• Areas of improvement:
  – Workplace modifications (APU, climate control, etc.)
  – Administrative controls (e-logs)
  – Preventive medicine (wellness exams, dietary and lifestyle coaching, healthy incentive programs, etc.)
  – Regulatory aspects of the DOT physicals
Discussion

- National providers database
- Better regulations
- Task Force creation
- Who is to be on a Task Force?
- Who develops regulations?
- How is it done in your country?