Lifestyle Risk Factors in Commercial Drivers

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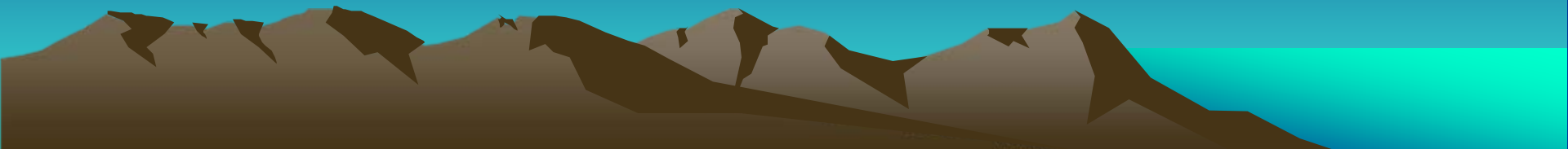


Background

- NIOSH identified **Truck Transportation** as a research focus area under the NORA Transportation, Warehousing, and Utilities (TWU) Sector Program Guidelines
  - This recognition was due in large part to the reported high rates of workplace injuries and illnesses in this Sub-sector

- TWU accounts for approximately 5 million workers of the US workforce
  - Approximately **2 million long-distance truck drivers**

- TWU Statistics (2003)
  - 16.9 deaths per 100,000 workers
  - 6.8 non-fatal injuries per 100 full-time TWU workers (50% resulted in lost days)
  - 1.1 job restriction or job transfer per 100 full-time TWU workers

- TWU represents a relatively small share of the workforce (~ 4%) , BUT presents a high impact due to reported:
  - High prevalence of chronic health problems (CVD, DM, HTN, etc…)
  - Low utilization of health resources
  - Truck accident influence on public health and safety

Injury and Crash Statistics

- **>500,000 truck accidents** in the US each year
  - Most truck accidents result in severe injuries
  - Fatal crash rate for large trucks is 50% greater than the rate for all vehicles on the roads
- **517 fatal injuries** (9% of total occupational fatalities) in the US trucking industry (2003)
  - Of those 517 fatalities, 73% occurred on the highway
- Although data are sparse, there is enough evidence to suggest that health problems, and modifiable risk factors (diet and physical activity) could significantly influence accident rates

Lifestyle Risk Factors

- Commercial Driver Lifestyle Challenges
  - Nutrition/Diet: needs may be met at roadside diners with limited choices
  - Exercise: Inadequate access to facilities for exercise and subsequent hygiene demands
  - Limitations in access of traditional healthcare resources
  - Drivers may often spend days to weeks away from home base

Lifestyle Risk Factors

- Commercial Driver Lifestyle Challenges (cont.)
  - Work Environment:
    - Sleep/Rest: needs may be met in truck cab sleeping berths
    - Physical Labor: Lengthy periods of sitting interspersed with periods of high physical activity (loading/unloading, securing loads, tire chains, etc…)
    - Vibration: Work space (truck cabs) subject to continuous vibration

Research Design and Methods

- Study Design:
  - Cross-sectional study: 96 Commercial Drivers from 3 large employers
    - Long Haul (over the road) Trucking
    - Regional/Long Haul Package Service
    - Municipal Public Transportation
  - Commercial Drivers recruited and enrolled into study
    - Individuals with >1 year commercial driving experience
    - Company participation and support of study
    - Individuals received incentive for completion of study
      - $20 Gift Card
      - Health Information (BP, Cholesterol, HbA1c)

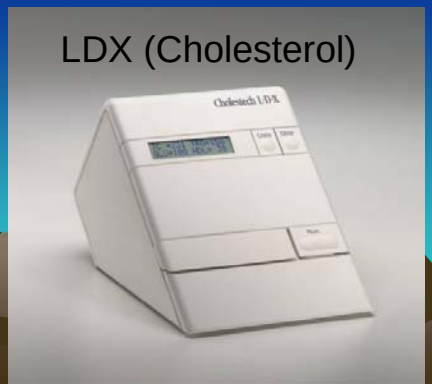
Baseline Assessment

1. Drivers completed Questionnaire app. 100 questions (via laptop)
    - Psychosocial dimensions
    - Prior and existing medical conditions
    - Lifestyle history (diet, exercise, etc…)
    - Driving history (duration, pattern, accidents, etc…)

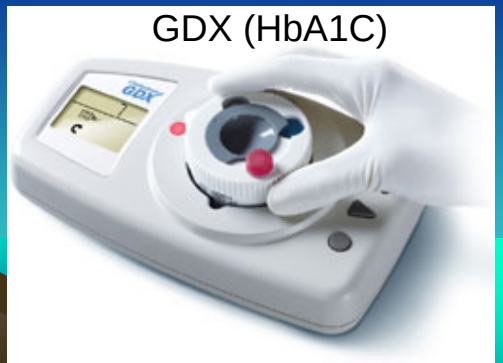
2. Biometric Data Collected
    - Calculated BMI from measured height/weight
    - Blood Pressure

3. Serological Data Collected
    - Cholestech point of care instrumentation
        - Total Cholesterol
        - HDL Cholesterol
        - Hemoglobin A1c

LDX (Cholesterol)



GDX (HbA1C)



Results

Table 1. Demographics

	All	Long Haul Trucking	Municipal Public Transportation	Regional/Long Haul Package Service
AGE	**48.4±10.8**	45.1±10.9	51.2±9.8	54.7±8.7
GENDER				
FEMALE	12 (12.5%)	4 (8%)	7 (19.4%)	1 (10%)
MALE	**84** (87.5%)	46 (92%)	29 (80.6%)	9 (90%)
RACE				
CAUCASIAN	**79 (82.3%)**	40	29	10
AFRICAN AMERICAN	10 (10.4%)	9	1	0
HISPANIC	4 (4.1%)	0	4	0
OTHER	3 (3.1%)	1	2	0
TOBACCO	50 (**52.1%**)	34 (68.0%)	8 (22.2%)	8 (80.0%)

Table 2. Self Report of Physician Diagnosed Disease

	All (n=96)	Long Haul Trucking (n=50)	Municipal Public Transportation (n=36)	Regional/Long Haul Package Service (n=10)
DIABETES	11 (**11.5%**)	5 (10.0%)	6 (**16.7%**)	0 (0.0%)
HIGH CHOLESTEROL	30 (**45.5%**)	13 (35.1%)	17 (**89.5%**)	0 (0.0%)
HIGH BLOOD PRESSURE	28 (**41.2%**)	13 (35.1%)	12 (**63.2%**)	3 (30.0%)

Table 3. Enrolled Subject Biometrics mean±sd (range)

	All	Long Haul Trucking	Municipal Public Transportation	Regional/Long Haul Package Service
SYSTOLIC BLOOD PRESSURE (mmHg)	**130±16** (100-**176**)	132±17 (104-**176**)	124±13 (100-151)	140±12 (118-152)
DIASTOLIC BLOOD PRESSURE (mmHg)	**81±10** (48-**120**)	81±10 (48-107)	78±7 (65-92)	91±12 (79-**120**)
BMI (kg/m^2)	**32.2±8.1** (16.6-**66.8**)	32.7±8.3 (22.4-**64.0**)	32.4±8.3 (16.6-**66.8**)	29.4±5.7 (20.4-41.0)

Table 4. Enrolled Subject Serology

mean±sd (range)

	All	Long Haul Trucking	Municipal Public Transportation	Regional/Long Haul Package Service
TOTAL CHOLESTEROL (mg/dL)	**210.2±43.1** (108.0-**343.0**)	220.9±44.1 (152.0-343.0)	**192.1±39.4** (108.0-297.0)	223.7±29.6 (164.0-250.0)
HDL (mg/dL)	**39.1±13.9** (17.0-98.0)	39.4±15.1 (17.0-98.0)	38.0±13.4 (21.0-80.0)	42.2±9.3 (29.0-59.0)
HBA1c (%)	**5.65±0.86** (3.40-9.50)	5.99±0.93 (4.10-9.50)	5.38±0.77 (3.40-8.00)	5.28±0.22 (4.90-5.60)

Conclusions

This population of commercial drivers:

1. Reports high prevalence rates of physician diagnosed:
   - Diabetes Mellitus (11.5%)
   - Hypercholesterolemia (45.5%)
   - Hypertension (41.2%)
2. Elevated blood pressure
   - Mean SBP= 130 mmHg, range (100-176)
   - Mean DBP= 81mmHg, range (48-120)

Conclusions (cont.)

3. Increased Obesity
   - Mean BMI= 32.2, range (16.6-68.8)
4. Elevated Total Cholesterol
   - Mean Total Chol= 210 mg/dL, range (108-343)
5. Suboptimal HDL Cholesterol (good chol)
   - Mean HDL Chol= 39.1mg/dL, range (17.0-98.0)

Conclusions (cont.)

6. Elevated HbA1c
   - Mean HbA1c= 5.65%, range (3.40-9.50)
7. Differences in health parameters exist among companies
   - Local v. long haul work
   - Wellness program
   - Physical demands of job

Discussion

- This study corroborates previous work indicating that commercial drivers are at increased risk from lifestyle risk factors for chronic disease
- Despite regular mandated physical examinations (DOT- CDME Exams), these individuals continue to sustain high rates of chronic disease (DM, HTN) and markers of chronic disease (elevated BP, BMI, total cholesterol, and HbA1c)

Discussion (cont.)

- Addressing specific workplace conditions and lifestyle activities of commercial drivers has the potential to positively influence disease outcome
- While direct evidence of a causal association between chronic disease and crash risk is scarce, there is enough evidence to propose that intervention on healthy weight through modifiable risk factors (diet and physical activity) could significantly influence accident rates

Strengths/Weaknesses

- Weaknesses
  - Cross sectional design limits attribution of cause
  - Study size limits power of analysis
  - Geographical location limits generalizability to broad cross section of population
- Strengths
  - 3 distinct commercial driver populations improves generalizability
  - Standardized comprehensive history
  - Standardized biometrics and serology

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