Title Page.

Preventing Work Injuries and Chronic Illnesses in Truckers

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Table of Contents

Abstract

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Background. Commercial Truck Drivers have numerous risk factors for chronic illnesses and poor health status, particularly problems directly or indirectly related to obesity and physical inactivity. This project included both: 1) large cross sectional study of truck driver"s health and 2) development of a Health Promotion Program tailored to the needs of the Commercial Truck Driving population.

Methods.

We successfully enrolled 817 Commercial Truck Drivers in a large cross-sectional study. Data collected included demographics, psychosocial factors, diet, physical activity, tobacco, medical history (e.g., diabetes mellitus, cardiovascular disorders, hypertension, sleep disorders, lipid disorders, low back pain), over the counter and prescription medication use, hours of driving and sleep habits. We also collected information on truck driving crashes and near-miss crashes. We measured blood pressure, heart rate, weight, height, and circumferences (waist, hip, chest and neck). We collected blood samples. Truck stops were visited to identify currently available food options and assess realistic physical activity options and limitations. Focus groups were conducted. A WHEEL program was developed. We then pilot tested the WHEEL program.

Results

A total of 817 U.S. truck drivers from 46 different states participated, including 705 (86.3%) males and 112 (13.7%) females. Drivers averaged 47.3±10.5 years old. The mean BMI was 32.88 ($\pm$ 7.40) kg/m^2. Mean total cholesterol was 191.99 ($\pm$ 1.2) mg/dL. The mean number of minutes per week of total physical activity is 322.5 ($\pm$ 373.1) min. per week. Mean hours worked per week was 57.9 ($\pm$ 21.0) hours. Career mileage ranged widely.

There were many statistically significant relationships between being involved in that reportable crash and personal factors psychosocial factors and occupational factors. The likelihood of crash increased by 3%, OR 1.03 per year of drivers age. Every year increase in total professional drive time was associated with an increase in involvement in a crash with an OR = 1.04. Self-reported snoring at night was associated with an increased risk of being involved in a reportable crash with an OR 1.40. Those reporting having been diagnosed with cardiovascular disease were statistically significantly more likely to have been involved in a reportable crash with an OR = 2.00 as compared to those who were not diagnosed with cardiovascular disease. Cell phone use while driving was also associated with increased risk of a reportable crash. Some psychosocial data were also associated with risk of crash, including a history of family problems, feeling tense, feeling uneasy, and feeling physically exhausted.

Focus group data included that drivers universally desired good health. However, few reported seeking health care on a consistent basis. Many barriers to healthy lifestyle (food options and exercise) were reported consistently.

Conclusion

There are many morbid health conditions and associated factors that are elevated in this population of Commercial Truck Drivers. We successfully developed a health promotion program to address major risks in these workers.

Section 1.

<u>**Scientific (Key) Findings.**</u>
1. Diverse Population. A total of 817 U.S. truck drivers from 46 different states participated, with 705 (86.3%) males. Drivers averaged 47.3±10.5 years old. The majority of drivers were white/Caucasian (86.4%). Most had at least a high school education (88.6%). There was a broad range of self-reported incomes, with most being between $25,000 and $75,000 per year (513 participants, 62.79%). Mean hours worked per week was 57.9 (± 21.0) hours and a total drive time hours per week was 57.4 (± 18.4) hours per week.

2. This population is obese. Mean neck circumference was 42.43 cm. Body mass indices (BMI) classified 62.1% as obese (mean BMI 32.88 (± 7.40) kg/m^2).

3. Blood measures are, on average, acceptable. Systolic blood pressure was 131.9 (± 19.28) mm HG and diastolic blood pressure was 84.25 (± 10.66) mm HG. Mean total cholesterol was 191.99 (± 1.2) mg/dL. Triglycerides were 227.37 (± 139.4) mg/dL. LDL cholesterol averaged 112.98 (± 4.1) mg/dL and HDL cholesterol was 36.5 (± 14.1) mg/dL. Glycosylated hemoglobin averaged 5.0%.

4. Physical activity is reportedly high. Physical activity totaled 322.5 (± 373.1) min/week, However, this does not appear to match the obesity issues.

5. Obstructive Sleep Apnea. 52 drivers (14.7%) had been diagnosed with sleep apnea and 414 (50.7%) self-reported having been told they snore at night.

6. Crashes and near misses. Most drivers (491, 60.1%) reported zero reportable crashes in his/her career. Most reported one crash, with the remainder reporting additional crashes. Similarly, there was a wide range of responses to the question of how many near misses have you had in the past year.

There were many significant relationships between being involved in that reportable crash and personal factors psychosocial factors and occupational factors. For every year increase in age there was an increase risk for crash with the odds ratio (OR) = 1.03 (95% CI 1.01, 1.04) per year. Women were less likely to have a crash (OR = 0.48). Self-reported snoring was associated with an increased risk of a reportable crash (OR 1.40). Cardiovascular disease was associated with an increased risk of crash (OR = 2.00, 95% CI 1.13, 3.57).

For every year increase in total professional drive time, there was an increased crash risk with an OR = 1.04. Drive time was significantly related to being involved in a crash with primarily nighttime driving being associated with lower likelihood of crash (OR of 0.43). Those using a cell phone in a city were more likely to be involved in a reportable crash. Risk estimates for cell use were 1) once a week (OR = 2.44), 2) 2 to 3 times a week (OR = 2.66), 3) 4 to 6 times a week (OR = 2.27), 4) once a day (OR = 1.75), or 5) more than once a day (OR = 2.25). Some psychosocial data were also associated with risk of crash, including family problems, feeling tense, feeling uneasy, and feeling physically exhausted.

7. Focus Group Data. The drivers universally desired good health. However, few consistently sought health care. Barriers to obtaining health care included schedules and the nature of their jobs. In general, drivers were not aware of healthy weight. Barriers to obtaining healthy foods included

cost, logistics of their job, time constraints, difficulty parking at healthy food outlets (stores and restaurants), and having limited storage and cooking facilities in their trucks. Many voiced exercise barriers including time, lack of gyms and shower facilities and places to park the truck.

Translation of Findings.
The health of the truck driving population is not optimal. Obesity and risk for sleep apnea (snoring) are high. This study also found elevated crash risks associated with these risks. Most of those factors appear modifiable.

The truck driver health promotion program (Worksite Health Eating and Exercising for the Long-Haul, WHEEL) was developed to target the needs of long-haul truck drivers and is being piloted. This program targets the obesity problem that this study and others have found.

Outcomes/Impact
The population of Commercial Truck Drivers included in this sample appear likely be generalized to the larger commercial driver population based on study sample methods and comparability of these data to other studies" data. These data demonstrate that drivers have health risks such as obesity and sleep apnea that are potential foci of intervention to improve the health and reduce injuries among drivers. Additionally, qualitative data from focus groups demonstrate that there are significant perceived barriers to healthy lifestyle activities, including eating and physical activity, for these drivers. Some problems appear solvable, but some problems will be challenging.

1. There are numerous modifiable risk factors among truck drivers. Some of these are immediate potential outcomes, including risks of crash noted above. For example, greater attention to cardiovascular disease and psychosocial risks appears warranted.

2. Perhaps the greatest intermediate outcome at this point involves the re-design of the Commercial Drivers Medical Examination form. The current form is limited, does not capture much of the information noted above, and is in need of redesign, including simplification of compound questions. This study could assist with that redesign process, and in the absence of federal changes, the PI plans to implement this change and publicize it as the requirements are to not do less than the federal form.

3. There are no "end outcomes" from this project, as those were never the intended outcome of this line of research that is early in its scientific development. However, pilot testing continues. If successful, the WHEEL study needs to be fully implemented and tested in a randomized design and that would potentially result in "end outcomes."

Section 2.

Background for the Project
The transportation and utilities sector represents almost 6-8 million workers[1] and approximately 4% of the US workforce. There are **approximately 2 million long-distance truck drivers**.[1] While this sector represents a relatively small share of the workforce they are a high impact group because of their poor health (2), poor utilization of the traditional health care system (3) and the impact of truck accidents on public health and safety. This includes one of the leading causes of occupational deaths annually (~4,500/year, BLS).

This proposal sought to:
> - Sample and measure a large cross section of the Commercial Truck Driving population,
> - Measure population-based health status indicators and chronic illness risk factors,
> - Take potentially useful measures not traditionally incorporated in the Commercial Driver Medical Examination (CDME),
> - Identify potential improvements in the CDME, and
> - Provide a Health Promotion Program that particularly targets modifiable risks while balancing the specific, occupation-related needs and requirements of the Commercial Truck Driver.

Commercial Driver Medical Examinations
Commercial Truck Drivers, along with many other commercial drivers, have been required to obtain medical examinations at least every other year to maintain their Commercial Driver"s License (CDL).[2] (The definition of Commercial Driver has several facets, including driving a vehicle >10,000# gross vehicle weight, involvement in interstate commerce, etc.) At an average cost of approximately $40 and without considering any additional testing, the total cost of these CDMEs is in excess of **$80 Million annually.**

The contents of these examinations is vaguely analogous to Federal Aviation Administration (FAA) flight physicals (see, e.g., (4)), yet substantially less complete, and less rigorous. This is troubling as, e.g., if the pilot sustains a syncopal episode, there is an existing, redundant back-up system in place to maintain flight, in contrast with a commercial truck.

Although there are longstanding medical examination requirements, to our knowledge, the teaching of a proper CDME has only occurred in the past 17 years, initially at the American Occupational Health Conferences, starting in Las Vegas, NV in 1995.

The CDME form was changed markedly for the first time in decades with a new form mandated to be in use no later than November 2, 2004. Numerous changes were made to this form in the process of this revision, including a longer history section containing more questions, providing boxes with options short of a full 2-year medical clearance to drive. The driver was required to sign the form and attest to the accuracy of the answers given in the history section. The physical examination section requires the examiner to note that multiple potentially disqualifying conditions are absent.

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[1] The Federal Motor Carrier Safety Administration does not know how many Commercial Driver's Licenses are issued (M. Gunnels, personal communication on at least 3 occasions from 2007-2009). They are likely to more accurately learn this through the course of the National Registry of Certiifed Medical Examiners which is currently being implemented.

[2] Examinations may occur more frequently, most typically if there are medical conditions that are thought to either require greater monitoring, provide some instability, and/or are associated with increased risk of crash.

While a major improvement, the new CDME form appears lacking in several aspects that include insufficient numbers of questions (there are only 26 questions), inadequate attention to either prescription or OTC medications taken (it is a separate section that frequently gets omitted), no assessment of tobacco, no question on dyslipidemia, etc. Despite dogma that 80% of relevant information in a history and physical examination is in the history, only about 25% of the form is physically occupied by questions of the driver. To our knowledge, there is no published systematic review of this form.

Despite our efforts, we have long recognized significant deficiencies and weaknesses in the required components of the CDME. These can be broadly grouped as inaccurate reporting (e.g., failure to report use of medications, sleep disorders), structural omissions (e.g., no required question on smoking or tobacco use, dyslipidemia, or placement of the medication use in a different location likely contributing to omissions), and substandard measures (e.g., urinalysis to detect latent diabetes mellitus). As well, there appear to be cohort effects involving the increasing prevalence of modifiable risk factors that are underway in the population that are increasing the average truck driver"s risk for a motor vehicle crash, and increasing the difficulty of the performance of these examinations.

A population-based analysis of biological measures is needed to help identify a more scientific approach to cardiovascular and other disorders risk stratification. The linkage between lipids and cardiovascular disorders is indisputable. There also is increasing evidence that C-reactive protein is associated with cardiovascular disorders (5-8). A determination of how widespread glucose abnormalities is needed to assist in determining whether all drivers with certain characteristics (e.g., age, BMI) need testing as part of the CDME.

Critically, most of these CDME examination issues have not been measured in a scientific manner with defined populations, sampling strategies, etc., rather they have been largely inferred. Some of these issues are discussed below.

Occupational Health and Safety of Truck Drivers
Transportation and utilities workers sustain major occupational morbidity, mortality and cost burdens. These costs are especially disproportionate as they represent a relatively small portion of the US workforce (< 4%).
- ✓ The fatal crash rate for large trucks is 50% greater than the rate for all vehicles on the roads.
- ✓ There are more than 500,000 truck accidents in the United States each year with most of these truck accidents resulting in severe injuries.
- ✓ In 2011 the fatality rate among driver/sales workers and truck drivers was 24.0 per 100,000 full-time equivalent workers, which was 8th overall in fatality rate (9).
- ✓ *In the trucking industry in 2009, there were 3599 fatal injury crashes among large trucks and busses.*
- ✓ Among transportation and warehousing industry, there were the most fatalities resulting in 15.0 deaths per 100,000 workers in 2001.

Although data are sparse, there is enough evidence to propose that intervention on healthy weight through modifiable risk factors (diet and physical activity) could significantly influence accident rates. Obese commercial truck drivers (BMI ≥ 30 kg/m^2) are reported to have a significantly higher accident rate (>2 times) than non-obese commercial truck drivers (10). The mechanism whereby obesity increases risk for accidents is not known, but obese truck drivers also report falling asleep unintentionally more often than normal or overweight truck drivers, and higher rates of sleep apnea

among the obese are well known. Significant reduction of obesity through bariatric surgery may be needed to improve or resolve symptoms of sleep apnea (11,12). Intervention to prevent significant obesity through moderation of weight prior to developing sleep apnea is desirable.

Prevalence of Chronic Diseases and their Risk Factors in Truck Drivers
One article estimated that 5%-10% of truck drivers are initially denied certification pending results of additional clinical tests (14). 1 in 3 drivers are certified for less than two years due to medical reasons (15), and this number is believed to be increasing with time. Although there are relatively few studies that report on the health status of truck drivers, the available data suggest that truck drivers have a greater prevalence of chronic disease particularly early heart disease than employees with other types of jobs in the same company or among men in the US population (13).

Estimates of the prevalence of hypertension among truck drivers range from 23% (3) to approximately 40% (13). Differences in these estimates may stem from a variety of different causes including whether measurement of blood pressure or self report of hypertension was used for the estimate of hypertension and other characteristics of the truck drivers and the studies. Importantly, one study found that only 13 percent of truck drivers with either systolic blood pressure over 160 mmHg or diastolic blood pressure over 95 mmHg or both were taking medication for hypertension (14) suggesting that untreated hypertension may be common in this population.

Likewise, the prevalence of elevated serum cholesterol among male truck drivers is estimated to be higher than the prevalence for men reported from the National Health and Nutrition Examination Survey (14). Nearly half of the respondents (47%) did not report having a regular health care provider (3) and thus may not have had the opportunity to learn whether they had normal cholesterol. Lower self-reported prevalence of high cholesterol could indicate undiagnosed hypercholesterolemia.

Low Back Pain and Vibration Exposure
Commercial truck drivers are at increased risk for low back pain (15). When a comprehensive review of the literature was accomplished by NIOSH, there was felt to be "Strong Evidence" for an association between whole body vibration and low back pain (1). Most of the Odds Ratios were 2-3, suggesting a moderately strong epidemiological relationship. However, most of the data supporting this are derived from cross sectional studies performed on drivers, and many data are more than 15 years old. In that interval, truck cabs have undergone major modifications, and the vibration exposures are advertised as being substantially lower (Pat Baldizan, Active Truck Sales and Parts, Personal Communication, July 17, 2006). Interestingly, workers with prolonged driving but without loading or unloading tasks, such as Taxi drivers are also at increased risk (16). The truck driving population appears to particularly have increased problems with back pain (15,17), possibly related to combined exposures. An association between prolonged sitting, whole body vibration and occupational low back pain (18) has been reported, thus there may be an interaction between these exposures, or possibly, sitting may confound the relationship to some degree. Road conditions appear to result in the greatest magnitude of vibration exposures (19). A relatively recent systematic review of vibration also found a lack of association with LBP (Bible. Spine 2012. 37:E1348.) Considering changes in all these relevant factors since most of the reported studies were conducted, a case-control study of whole body vibration and the risk for low back pain might not be particularly informative.

Risk Factors for Poor Health of Truck Drivers
The poor health status of truck drivers is commonly attributed to their lifestyle (diet and physical activity) and work environment (2,20-22), although little data are available to understand the relative importance of these factors. Given the reported high prevalence of health problems among truck drivers and the high impact of truck accidents on the community, understanding their lifestyle and work environment on health status and occupational health and safety is warranted.

Available data from 359 truck drivers suggests that truck drivers would be interested in an intervention aimed at healthy weight through diet and physical activity relevant to their work environment (3). Eating healthy on the road was the most commonly selected health topic (65%) and exercise in general or on the road (58%) was the second most commonly selected topic. Many other health topic interests including how to avoid back and neck pain (48%), managing high blood pressure or heart disease (33%) and managing cholesterol, sleeping problems/sleep apnea (31%) might also be positively influenced by improving diet and physical activity. In addition, truck drivers have trouble utilizing health care services in the US (3). This lack of utilization of health care services and information indicates that the worksite is a potentially critical source of health promotion.

Weight lies in the path to other traditional health outcomes that are important to truck drivers and to occupational health and safety outcomes. Limitations in work are more than twice as common among obese workers in the US (7%) as compared to normal weight workers (Pfizer report). The average BMI of truck drivers surveyed at Tennessee truck stops was 30 kg/m^2 and 37% were overweight and 45% were obese (13). Only 19% were normal weight. Obesity is associated with twice the prevalence of hypertension and four times the prevalence of diabetes than normal and overweight workers, two of the most commonly addressed issues in the CDMEs for truck drivers. Sleep disturbance, including sleep apnea has been estimated to affect up to 78% of commercial vehicle drivers ("truckers") (17) and vehicle crashes, as well as fatalities mount daily (18). It is yet unknown how much of the reduction in time of medical certification or the failure rate on the CDME are attributable to obesity.

There are few data to document the factors associated with the prevalence of obesity among truck drivers, but their work environment is a likely contributor. Obesity is reported to be greater among drivers who worked for a company longer than a year compared to those who worked for the company for less than one year (22). It is unknown whether the association is causally related to their occupation, or not. Nonetheless, truck drivers spend prolonged amounts of time sedentary while working. Obesity has been found to be significantly associated with prolonged sitting time (23). The risk for being overweight or obesity was almost doubled (OR=1.92, 95% C.I. 1.17-3.17) among men who sat for more than 6 hours a day compared to those who sat for 45 minutes or less.

Conceptual Framework for Developing the WHEEL Program
Many of the risk factors and disease states (diabetes mellitus, cardiovascular disease) that limit driver certification are linked to obesity. **Therefore, the main thrust of the interventional program in this project was planned to target weight reduction.** Two broad constructs affecting health behavior have been developed from theories of behavior change (24-26). Intrapersonal factors include knowledge of recommendations, beliefs in behavior-health association, and self efficacy. Interpersonal factors include enabling or environmental factors such as social support or norms (24,26). Indeed, both intrapersonal and interpersonal factors are reported to be associated with dietary intake and exercise and we theorize their relationship is predictable using the Precede-Proceed model that guides some of our current and previous research (27) (Figure 1). It is logical that

this model could extend to psychological, social, and environmental factors associated with achieving weight loss as well as health behaviors and cultural practices that influence achieving weight loss. This model was used for the development of the intervention towards the end of this project.

The first step of the Precede-Proceed framework is to conduct a needs assessment to determine perceptions of members of the target population with regard to their needs and issues relevant to the outcome(s) of interest. In this way, an intervention can be crafted and implemented. The next two steps involve epidemiological, environmental, and behavioral assessments of the health problem under consideration. The results of these assessments will inform the intervention. Our ultimate goal was to use the formative data collected from focus group participants and questionnaire respondents to guide development and deployment of an intervention for truck drivers.

The Precede-Proceed model includes categories of psychosocial and behavioral determinants that are sufficiently broad to incorporate relevant theoretical constructs and considers individual-interpersonal and community- or environmental-level health behavior theories and models. Predisposing, reinforcing, enabling and environmental factors are considered and they collectively influence the likelihood that behavioral change will occur.

A person"s belief that certain individuals approve or disapprove (encourage or discourage) of his or her performing a certain behavior, weighted by his or her desire to comply with the opinions of such individuals, can, have an impact on physical activity and diet (28). Social networks and social support have been shown to have both buffering and direct beneficial effects on a diversity of health outcomes, including mental health symptoms, compliance with health regimens, and participation in health protective behaviors (29,30). Several studies have identified a positive influence of social relations (e.g., number of social contacts, availability and satisfaction with emotional and instrumental support, etc.) on eating healthy and engaging in physical activity (31-34). The intervention, in turn, will address these mediators and modifiers (domains of the model) to effect behavior, physical activity, and weight change.
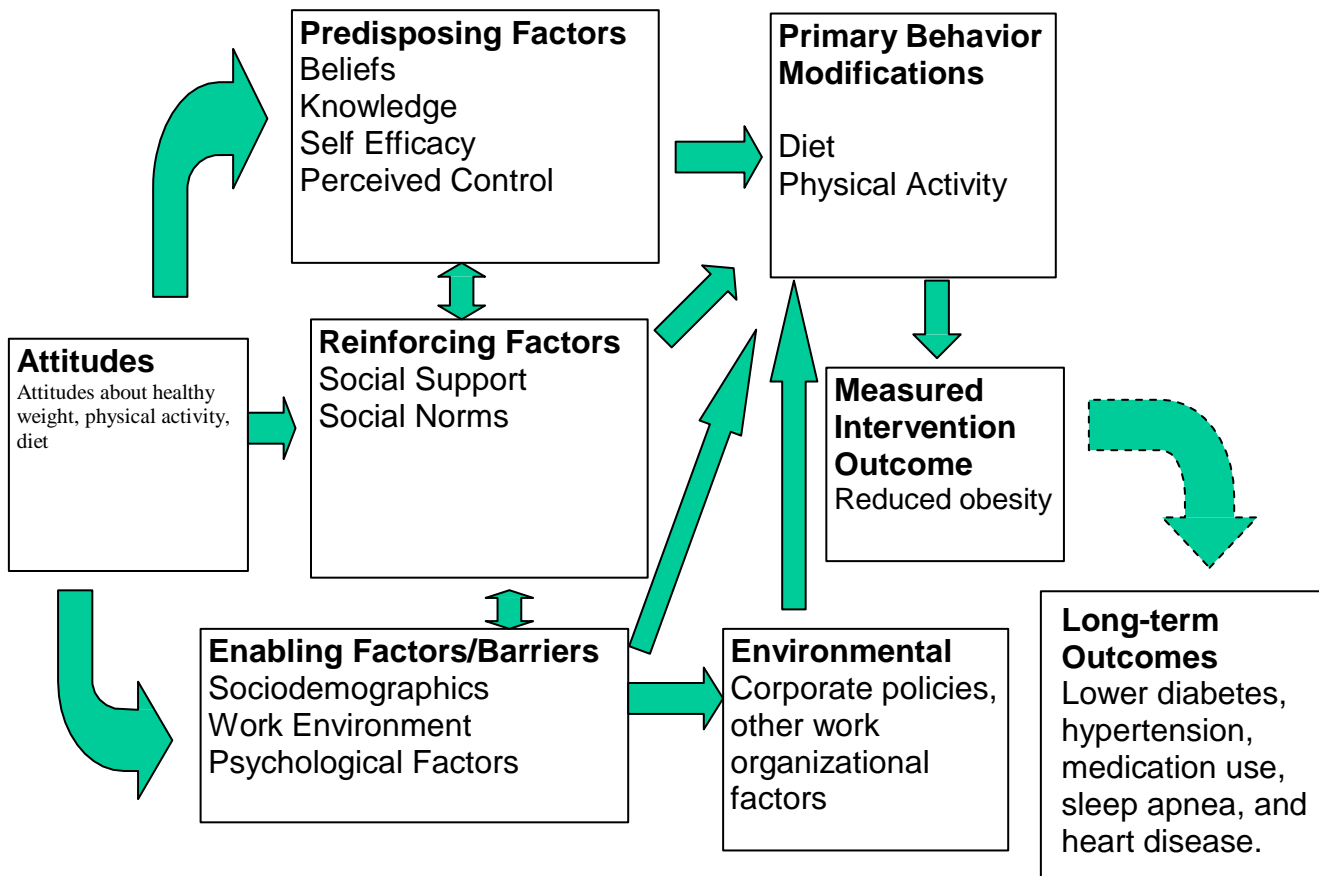
Figure 1. Conceptual Model used for this research project to modifying body weight and physical activity to reduce risk for Obesity, Diabetes Mellitus, Hypertension and Cardiovascular Diseases.

Relationship of this work to NORA and Other Research Agendae

The transportation sector has been, and continues to be, a poignant occupational area for the improvement of health. For several years, NIOSH has been a leader in addressing the concerns of truck drivers. In 2003, NIOSH was co-sponsor of a workshop at the *Truck Driver Occupational Health and Safety Conference* encouraging continued collaboration between NIOSH and transportation experts, and leading to funding the Occupational Motor Vehicle Safety and Health Research program (http://www.cdc.gov/niosh/docs/2006-121/pdfs/2006-121.pdf). In 2003, the United States Senate unanimously passed Senate Resolution 210, which "by declaring October National Work and Family Month, the U.S. Senate concurred with Alliance for Work-Life Progress (AWLP) that „supporting a balance between work and personal life is in the best interest of national worker productivity" and that „reducing the conflict between work and family life should be a national priority‟" (http://www.awlp.org/awlp/nwfm/docs/ wl_month_internal_release.doc). More recently, the February 27, 2006 NORA Townhall Meeting held in Salt Lake City was the largest ever NORA Town Hall Meeting. It drew many researchers, practitioners, business owners and employees from a broad spectrum of fields throughout the entire Intermountain West. This meeting was held to get local feedback for NORA II, which was the next 10-year focus of NORA-II research in occupational and environmental health, and included the needs in the truck/transport industry. Top concerns for those in the transportation industry included: (a) fatigue related to shift work, (b) health and wellness, (c)

ergonomics, (d) training and safety, (e) environmental concerns, (f) aging of workforce, (g) young, inexperienced workforce, and (h) factors limiting to drivers – MSK, fatigue, whole body vibration (low back pain), aging, wellness. (http://rocky.utah.edu/). Industry owners and operators asked researchers and NIOSH to look into these concerns. Healthy People 2020 challenges the people of the United States to take specific steps toward living a healthy life-style and reducing mortality and morbidity. People across the United States have joined with the government in declaring their concerns for occupational health and safety, particularly in this occupational sector. This proposal has the potential to address a broad spectrum of issues and achieve many of the goals that have been set. Furthermore, this proposal was able to implement and evaluate findings allowing us to turn our research questions into solutions for health and safety practitioners.

In summary, Commercial Truck Drivers have numerous risk factors for chronic illnesses and poor health status, particularly problems directly or indirectly related to obesity and physical inactivity. Surprisingly, the prevalence of these risks, the interactions between and among them, and their impacts have not been previously studied. These risk factors and health conditions are underreported, and may be responsible for increased risk for accidents. The current CDME form and health evaluation processes have problems that are fixable. A Health Promotion Program tailored to the needs of the Commercial Truck Driving population is needed. We developed a Truck Driver Health Promotion Program and pilot-tested its feasibility of implementation and determine effect size for future research. Because obesity lies in the pathway to other chronic disease, reduced risk for other chronic illnesses should also result, but such outcomes were not measurable within the time constraints of this project.

Goal: **To study a broad cross section of 1,000 Commercial Truck Drivers taken from a total potential sample size of 5,000+ in two states, measure and evaluate their overall health and chronic illnesses risk factors, and develop and pilot-test an intervention to address major health promotion needs specific to Commercial Truck Drivers.**

Hypothesis 1: The average commercial truck driver has significantly more risk factors for chronic illnesses, and worse health status than both workers in general industry as well as the general population.

H_1 1A.   Commercial truck drivers have higher age-adjusted prevalence rates of (1) obesity, (2) hypertension, (3) diabetes mellitus, (4) dyslipidemia, (5) tobacco use, (6) prescription and over the counter medication use, (7) sleep disorders, and (8) cardiovascular disease than the rates in both industry workers, as well as the general population.

H_1 2A.   Commercial truck drivers have high fat diets, low physical activity levels, and less sleep compared with the general population.

H_1 3A.   Commercial truck drivers have a higher prevalence of low back pain due to whole body vibration than either the general population or other industrial workers.

Hypothesis 2: The current Commercial Driver Medical Examination (CDME) form underestimates health status and chronic illness risk factors and diseases.

H_2 1A. There is underreporting of chronic illness risk factors and conditions in the medical history section of the CDME form.

H_2 2A. Serological tests are superior to currently required urinalyses, which are insufficient to more accurately reflect diabetes mellitus and other health assessments in commercial truck drivers.

H_2 3A. Improvements in the medical history section of the CDME form and examination procedures are possible.

Hypothesis 3: Develop a Health Promotion Program targeting the specific needs of the commercial truck driver to significantly reduce risk factors from chronic illnesses.

H_3 1A. A specific program targeting the needs of the commercial truck driver is feasible and effect sizes for outcomes will be determined by a pilot test.

A. Specific Aims

1. Measure risk factors and calculate prevalence rates for chronic illnesses and health status of 1,000 Commercial Truck Drivers in two states (UT and WI) and compare them with rates in general industry and the general population.
    a. Administer questionnaires that contain both the medical history items from the CDME form and additional measures of the driver"s risk factors for chronic illnesses and health status [e.g., history of diabetes mellitus, cardiovascular disorders, low back pain, sleep apnea, lipid disorders, exercise, tobacco, over the counter and prescription medication use, etc.].
    b. Obtain objective measures including blood pressure, heart rate, circumferences (hip, waist, chest neck) and height and weight to calculate Body Mass Index (BMI) and other indices (e.g., waist/hip and chest/waist ratios).
    c. Collect fasting blood samples to measure total cholesterol, HDL cholesterol, triglycerides, highly sensitive C-reactive protein (CRP), hemoglobin A1c and fasting glucose.
    d. Perform dipstick urinalyses.
2. The current Commercial Driver Medical Examination (CDME) form captures health status indicators suboptimally.
    a. Compare the risk factors for chronic illnesses and health status independently identified in this research project with those found on the most recent CDME.
    b. Identify misclassifications of CDME certification categories between two sets of data [(a) the most recent CDME and (b) the results obtained in this study] and determine factors that are associated with the differences.
    c. Identify potential changes and improvements in the CDME form and procedures.
3. Develop a truck driver health promotion program (Worksite Health, Eating and Exercising for the Long-Haul, WHEEL) to target the specific needs of the commercial truck driver.
    a. Pilot test the WHEEL Program for its feasibility and to determine effect sizes for a larger scale trial of the efficacy.

Research Design and Methods

Study Design: **Large Cross Sectional Study Involving 1,000 Commercial Truck Drivers to Determine Risk Factors for Chronic Illnesses and Health Status of Commercial Truck Drivers. Develop and pilot test a Truck Driver Health Promotion Program.**

D. General Study Design

AIM 1
1. **Enroll 1,000 Commercial Truck Drivers in Two States in a large cross-sectional study. (Accomplished** with 817 enrolled)
2. **Administer computerized questionnaires to participating drivers in small groups (2-10 workers) at the worksites. (Accomplished).** Extensive (pre/pre/pre/etc.)pilot testing, Field pilot-tested questionnaires was used to collect demographics, psychosocial factors, diet, physical activity, tobacco, medical history (e.g., diabetes mellitus, cardiovascular disorders, hypertension, sleep disorders, lipid disorders, low back pain), over the counter and prescription medication use, hours of driving and sleep habits (See Appendix). They were used to collect information on truck driving crashes and near-miss crashes. The Baseline Questionnaires required approximately 30 minutes to complete.
3. **Measure blood pressure, heart rate, weight, height, and circumferences (waist, hip, chest and neck). (Accomplished).** These measurements were taken immediately following the Questionnaires. (See Health Status Measurements Form, Appendix 2).
4. **Collect <u>fasting</u> blood samples to measure total cholesterol, HDL cholesterol, triglycerides, highly sensitive C-reactive protein, Hemoglobin A1c and glucose.** Blood samples were collected and analyzed by trained technicians following the anthropometric and other measurements in #3 above. (See Health Status Measurements Form, Appendix 2)
5. **Collect urine samples and analyze using dipstick urinalyses.** These will be obtained immediately following the blood samples and analyzed by the same technicians (See Health Status Measurements Form, Appendix 2). The above procedures (#1-5) take approximately 1 hour and complete the enrollment processes for the 1,000 subjects.
6. **Conduct a nested case-control study to analyze the effects of vibration on LBP.** Due to the unanticipated difficulty obtaining access to truck drivers for this study, we did not have resources for this part of the project.

Aim 2
7. **Obtain the commercial truck driver's most recent Commercial Driver Medical Examination (CDME) form from the employer or clinic.** Record the findings from that examination, including medical history, physical examination, particularly the risk factors for chronic illnesses and health status. (See CDME Abstraction Form, Appendix E)
8. **Independently categorize each truck driver's length of licensing certification status by a blinded panel of board certified occupational medicine physicians with two different sets of data.** Due to the challenges of obtaining access to drivers, sufficient time for these two aims was no longer workable. However, we were able to meet the overall aim of these two items (#7-8) through the methods to identify areas for improvements in the CDME form.
9. **Perform statistical analyses to describe the population, their risk factors for chronic illnesses and health status measures.** Compare results of our Baseline Questionnaire, anthropometric and other objective measurements, blood samples, and urinalyses to the most recent CDME results.

Aim 3

10. Develop and pilot a truck driver health promotion program (Worksite Health Eating and Exercising for the Long-Haul, WHEEL) targeting obesity based on formative assessment of truck drivers and their environment. Visit truck stops to identify currently available food options and assess realistic physical activity options and limitations. (See Appendices F-I), conduct focus groups with truck drivers, develop and pilot test an intervention focused on weight reduction.

All Aims

11. Return the results to the participating drivers and companies (in aggregate), and disseminate the findings through publications, Continuing Education and Outreach. This continues to be in progress. We did return results promptly to drivers. We are developing publications and continuing education materials.

Research Design and Methods

Study Design: **Large Cross Sectional Study Involving 817 Commercial Truck Drivers to Determine Risk Factors for Chronic Illnesses and Health Status of Commercial Truck Drivers.**

General Study Design and Study enrollment process

1. **We developed detailed survey instruments through extensive development, pre-pilot testing, pilot testing and field-testing.** These instruments were then computerized, including skip sequences to afford higher quality data simultaneously reducing missing data.

2. **We successfully enrolled 817 Commercial Truck Drivers in a large cross-sectional study.**

3. **Administered computerized questionnaires to participating drivers in small groups (2-10 drivers) at the worksites, truck stops, and national conferences in seven states.** We field pilot-tested computer administered questionnaires to collect demographics, psychosocial factors, diet, physical activity, tobacco, medical history (e.g., diabetes mellitus, cardiovascular disorders, hypertension, sleep disorders, lipid disorders, low back pain), over the counter and prescription medication use, hours of driving and sleep habits (See Baseline Questionnaire. We also collected information on truck driving crashes and near-miss crashes. Questionnaires required approximately 40 minutes to complete. If drivers were not comfortable using a laptop, a trained study staff member assisted the driver complete a paper version, although this was virtually never needed as a Research Assistant was usually able to facilitate the computerized administration in the rare occurrence of computer unfamiliarity.

4. **Measure blood pressure, heart rate, weight, height, and circumferences (waist, hip, chest and neck).** These measurements were generally taken immediately following the Questionnaires. If taken prior to the questionnaire, the driver was seated for a minimum of 5 minutes before the blood pressure was taken.

5. **Collect blood samples to measure total cholesterol, HDL cholesterol, triglycerides, Hemoglobin A1c and glucose.** These mostly non-fasting blood samples were collected and analyzed by trained technicians following the anthropometric and other measurements in #3 above. Results were immediately returned to the participants with interpretive information. Those with abnormal values were instructed to followup with their healthcare providers.

6. Develop and pilot a truck driver health promotion program (Worksite Health Eating and Exercising for the Long-Haul, WHEEL) targeting obesity based on formative assessment of truck drivers and their environment. Truck stops were visited to identify currently available food options and assess realistic physical activity options and limitations. Focus groups were conducted. A WHEEL program was developed.

Aim 2

7. Obtain the commercial truck driver's most recent Commercial Driver Medical Examination (CDME) form from the employer or clinic. Ongoing efforts necessitated over 1.5 years to obtain a Certificate of Confidentiality for this project. As these problems shortened the timeline to enroll sufficient subjects, we then worked to enroll as many subjects as possible. Subsequently, access to workers was extremely difficult, especially with the economic conditions. Next, we found that it was difficult enrolling subjects on-site at most trucking facilities. Next we moved to enrollments at truck stops. That worked to enroll a fair number of subjects. However, that was still inadequate and we moved to truck shows to enroll, which is where the majority of subjects were enrolled. These methods resulted in enrolling a wide cross section of truck drivers that appears quite representative of the entire truck driver population. However, those plans also made parts of this aim unachievable as originally planned, because we could not contact and clinics would not give access to those commercial driver medical examination forms. Instead, we were able to identify certification lengths based on review of the questionnaire data provided.

Aim 3.

Return the results to the participating drivers and companies (in aggregate), and disseminate the findings through publications, Continuing Education and Outreach. Accomplished and Ongoing. All results were immediately returned to every participant, including individualized data on health metrics. Continuing Education and Outreach sessions have been and continue to be held (e.g., American Occupational Health Conference and NIOSH-sponsored Trucking conferences). Three publications have been drafted and are nearing submission. Publications, Continuing Education and Outreach will be ongoing.

Questionnaire

Subjects were consented and enrolled in the study at their workplaces.

We then immediately proceeded with the laptop administered Questionnaires and other enrollment procedures. The Questionnaire captures relevant information in all of the following domains:

> (1) Demographics
> (2) Medical History (e.g., risk factors, disorders, injuries)
> (3) Fat screener
> (4) Physical Activity
> (5) Psychosocial factors (e.g., anxiety, depression, job satisfaction)
> (6) Stress
> (7) Commercial Truck crashes and near misses.

Where possible, we used validated published scales (e.g., Block Dietary Fat Screener, NutritionQuest, Berkeley CA, and others (19, 20, 46). The Questionnaire was designed to take no more than 40 minutes to complete, and was completely computerized for laptop administration with which we have extensive positive experiences with increased subject interest, ease of administration, completeness of data capture and eliminating data entry.

Demographics

Demographic factors of particular interest to the objectives of this research include age and gender. We collected race and ethnicity information because there is robust evidence of differences in rates of diabetes mellitus and other disorders among certain groups, however, direct evidence of those factors impacting crash rates is sparse.

Medical History
The Questionnaire was designed to have questions to assess all of the conditions assessed on the CDME form. It had additional items to allow for a comparison between those "items" and other items published elsewhere as being useful in relating to driver health and wellness. The items of interest particularly include: history of diabetes (including treatment), hypertension, tobacco, dyslipidemia, cardiovascular disease, prescription and over-the-counter medication usages, sleep disorders, low back pain (not solely chronic, unlike the CDME form), and other MSDs. Questions are included that are not on the current CDME form (e.g., tobacco, caffeine intake, dyslipidemia history). Questions that are specific to the nested case-control on low back pain are also included in this section, including pain onset, intensity, and duration.

Diet: Fat Screener
This tool included 17 questions, and takes approximately 5 minutes to complete. It is designed to rank individuals with regard to their usual fat intake rather than provide an individual estimate of fat intake (NutriQuest, Berkeley, CA). Results were analyzed using prediction equations to generate estimates of 6 nutrients. Portion sizes were not asked.

Physical Activity
Physical Activity was assessed using an in depth battery of questions to identify free living physical activity, both exercise (e.g. walking, running, swimming) and life activity (e.g. housecleaning, gardening). These batteries of questions have been utilized in prior cohort studies (36-39) and are desirable in this application for the combination of breadth and depth of physical activity captured, comparability with industrial workers, and ease of administration.

Psychosocial Factors.
We included questions on anxiety, depression and job satisfaction. While entire psychosocial batteries are desirable, they were not practical to meet all other hypotheses and aims due to time demands to complete extensive psychosocial batteries. Items selected were the same as those we have used in our low back pain and distal upper extremity prospective cohort studies, thus we have data on these items from over 1,800 subjects in wide range of employments to compare with driver responses.

Commercial Truck crashes and near misses
Truck drivers were asked several questions on truck crashes, near misses and attributable causes. These included the actual number of reportable truck crashes in their career as a professional driver and recalled near misses in the past month (defined as requiring evasive action to avoid a crash). Drivers were also asked for their opinion on attributable cause(s) of these events (e.g., other"s actions, sleeping, weather, road hazards, medication use). These measures were compared with the entire battery of results from this study to ascertain if there are additional, early markers of crash risk. We recognize that we do not have enough statistical power to detect effects and recall biases are likely within these data, however, we believe these data are helpful in understanding causes for truck crashes and near misses.

Body Mass Index and related measures of obesity

Body Weight

Measurements were made with participants in loose clothing with coat, shoes, belt and heavy objects from pockets removed. Participants were weighed using a Digital Scale placed on a flat, uncarpeted surface. The scale was zeroed. Participants were asked to stand on the scale platform, looking straight ahead with his/her weight evenly distributed on both feet. Weight was measured in kg and recorded to the nearest tenth.

Height

Standing height was measured with a stadiometer. The participant was asked to stand erect on the floor with back against the vertical mounted ruler, heels together and looking straight ahead. The staff made sure that the participant held their head in the Frankfort horizontal plane using a ruler and asked the participant to breath normally and maintain posture. The right angle of the stadiometer is brought down snugly, but not tightly, on the top of the head. The participant"s height was rounded to the nearest half centimeter and recorded.

Waist, Hip, Chest and Neck Circumferences

Waist and hip Circumferences were measured using the Novel Products Figure Finder tape This measure was conducted because waist circumference may be more associated with metabolic (diabetes) and cardiovascular risk than BMI (53). Neck circumference was measured due to its apparent role in risk for Obstructive Sleep Apnea. Circumferences were taken with the participant standing, usually immediately after measuring weight and height. We measured each circumference (waist, hip, chest and neck) once, and then repeat the tests. Waist was measured at the smallest point between the 10th rib and the iliac crest, checking to see if tape is level front to back. In some obese subjects it may be difficult to identify a waist narrowing. In such cases, the smallest horizontal circumference was measured in the area midway between the ribs and iliac crest. Hip circumference was measured at the level of maximum protrusion of the gluteal muscles, checking to be sure that tape is level front and back. Horizontal chest circumference was measured after placement of the tape under the arms after raising them for locating horizontal and then lowering arms. Measurements were recorded to the nearest half centimeter.

Blood pressure and Heart Rate

Blood pressure was measured after the subject completed the questionnaire in nearly all cases, thus achieving 5 minutes of time spent seated. If they performed activities out of sequence, generally to facilitate subject flow, we assured a minimum of 5min sitting time before measurement. The cuff was deflated prior to application. An automated cuff is placed with the sensor over the brachial artery and checked for appropriate size. Large cuffs are available for this project. Blood pressure was measured by the LifeSource Model # UA-767HL Blood Pressure Monitor (A&D Medical, Milpitas, CA) blood pressure machine. The machine also reads the heart rate. The heart rate was recorded in beats per minute. The diastolic and systolic blood pressures were recorded in millimeters of mercury. Participants received feedback at the time of the enrollment that also interprets their blood pressure in relation to the recently published guidelines (54).

Blood Testing

We used the Cholestech system (Cholestech Inc, Hayward, CA) to measure capillary fasting Glucose, Hemoglobin A1c, total cholesterol, triglycerides, Low Denisty Lipoprotein (LDL) and High Density Lipoprotein (HDL). The measurements were made from a capillary finger-stick and results

were available within 6 minutes. Individual feedback of the results was provided to recipients at the time of their measurement.

Development of a Truck Driver Worksite Health, Eating and Exercising for the Long Haul (WHEEL) program to target the specific needs of the Commercial Truck Driver.

WHEEL Development and Pilot
The Worksite Health, Eating and Exercising for the Long Haul (WHEEL) program is an intervention that was designed through this project to specifically target the needs of the Commercial Truck Driver. The main purpose of this intervention is to reduce risk factors and chronic illnesses primarily by reducing body weight. We used a community (truck drivers) participatory research approach in designing WHEEL because of the unusual needs of commercial truck drivers (55). Those unusual needs include prolonged time spent seated, frequency and duration of time spent away from home, and high calorie, low nutrient dense food choices. This program was informed by formative data from environmental truck stop assessments, focus groups with truck drivers, and additional questionnaires completed by truck drivers participating in the WHEEL pilot. The intervention includes both dietary and physical activity components.

Environmental Truck Stop Assessment
We visited multiple truck stops before we conducted focus groups (within 75 miles of Salt Lake City). These truck stops were assessed for food and physical activity environment to better understand these issues, as well as generate questions for the focus groups. Specifically, we noted the safety and feasibility of suggesting that drivers walk around the perimeter of truck stops or other adjacent areas for exercise. For example, we noted the presence or absence of broken glass, trash, and other debris on the parking lot, lighting, personal safety, traffic, and integrity of the surface of the parking lot. We determined whether there was adequate space to walk by measuring the potential distance of a „lap" with a pedometer.

We also assessed the types of food available at the truck stops" convenience store using the food stores checklist developed elsewhere (56). We documented the availability of fresh fruits and vegetables, salads, sandwiches made to order. We evaluated the number of food choices that have < 30% of their total calories from fat. We assessed the availability of snack foods that would be safe (from food safety and driving perspectives (able to eat while driving) for truck drivers to keep in their truck. In addition, we recorded cost of the items and compared their cost with like items sold at grocery stores within 10 miles of the truck stop, where applicable. Quality of food available at truck stop restaurants was evaluated using the Menu Checklist (57). This tool was developed using theoretical work on environmental indicators and previously tested instruments). It has high inter-rater reliability and the measurement approach is generalizable to restaurants in any community.

Focus Groups
We conducted a series of **four focus groups** (1 via teleconference and 3 in person). Participants for the teleconference were recruited from the parent study and were provided additional incentive of $20 to partially compensate for time. Focus groups included 8-10 truck drivers and efforts were made so that most sessions included at least one female driver.

Focus groups were conducted by Dr. Anita Kinney who has years of experience conducting focus groups on behavioral health issues. Questions began with general attitudes towards health, healthy weight, and health care seeking. Healthy diet was explored including questions on what the drivers

felt was a healthy diet, where they got their information from and the challenges they face in eating a healthy diet. Physical activity was also explored including activities that the drivers routinely do and the challenges to getting enough physical activity. Focus group sessions were audio recorded and transcribed for qualitative analysis using Atlas.ti.

Focus Group Moderator Guide
We asked a series of open-ended questions regarding informational preferences about diet and physical activity among truck drivers as well as enablers (e.g., motivating factors and barriers to participating in an intervention program) in the focus group sessions. We also asked open ended questions about what they would like in the WHEEL Program, what would motivate them to participate in WHEEL and how such a program should be delivered to them. Questions were asked about the work environment and policies that might act as barriers or reinforcers to healthy eating and activity.

WHEEL Questionnaire

Physical Activity
Physical activity was measured using the same series of questions that were used in the main study questionnaire. Participants are asked to report types, frequency and duration of leisure time activity. This allows estimates of METS/week and calories/week of physical activity.

Predisposing Factors
Knowledge/Perceived benefits/attitudes There was little published information to inform us regarding what truck drivers know about healthy diets and levels of physical activity. Therefore, in order to understand what level of knowledge exists, we asked questions to ascertain the knowledge about the health benefits of diet and activity and recommendations for having a healthy diet and being physically active. A series of questions was asked about perceived benefits and/or attitudes towards healthy diets (e.g. fruit and vegetable intake, fast food consumption, eating on the road).

Self Efficacy/Perceived Control. A series of questions was asked about how confident the respondent is in their ability to eat a healthy diet (e.g. fruits and vegetables, less fast food, making low fat choices on the road) and being physically active (e.g. meeting current recommendations for activity while on the road) and how much control they feel they have. We used a 25-item scale asking how sure the respondent was that he could carry out specific behaviors (e.g., eating fruits and vegetables) (58) and add questions as necessary (e.g. choosing low fat foods on the road). Likewise, the 12-item Exercise Confidence Scale or others used in previous research (59) was utilized and questions added as necessary to be appropriate for truck drivers.

Reinforcing Factors
Social support. Questions regarding whether truck drivers perceive support from other people (e.g. partner, family, co-workers) to eat healthy diets and being active were asked. Social networks and social support have been shown to have both buffering and direct beneficial effects on a diversity of health outcomes, including mental health symptoms, compliance with health regimens, and participation in health protective behaviors (29,30). Several studies have identified a positive influence of social relations (e.g., number of social contacts, availability and satisfaction with emotional and instrumental support, etc.) on eating healthy and engaging in physical activity in Hispanics and non-Hispanics (31-34). As part of the broader psychosocial context, social support from one"s family and social network has demonstrated reliable beneficial effects on health-related outcomes including cancer screening behavior. We used the abbreviated (10 item) Social Support and Eating Habits Survey and Social Support and Exercise Surveys.

Social Norms. We assessed the extent to which eating healthy and being physically active are expected of participants using questions such as "People in my neighborhood walk for exercise." Similar to social support, normative influences may positively or negatively influence health-related behavior. Research on normative influences suggests that physicians and other health care providers, as well as significant others, play a powerful role in influencing health-related behavior. Social influence was measured with questions assessing 1) subjective norms regarding diet and physical activity; 2) work and other social network members" explicit encouragement of energy balance-related behaviors; 3) perceived norms about diet and physical activity (family and other social network members diet and physical activity behaviors), and provider recommendations and communication about weight, diet and physical activity. We used measures that have been validated and used previously (30,31,60) and add questions as necessary for truck drivers.

Enabling Factors or barriers
We asked a series of questions regarding what makes eating a healthy diet (e.g. fruits and vegetables, less fast food, and eating healthy on the road) or being physically active (e.g. meeting current recommendations for activity) difficult. Questions included resources and other factors (31,61-64). Questions from the Project Grad Health Assessment Survey regarding the environment were evaluated for use to assess barriers to physical activity (65).

Diet
The Diet History Questionnaire (DHQ) was completed by participants of the pilot WHEEL Program. In order to get a more comprehensive estimate of dietary intake, we used the web based version of the National Cancer Institute‟s DHQ which is based on the paper version. Diet History Questionnaire, Version 1.0 National Institutes of Health, Applied Research Program, National Cancer Institute, 2002) to assess dietary intake of participants in the focus groups. This questionnaire was developed using cognitive theory (66), evaluated for misclassification against biomarkers (67), and other dietary questionnaires (68). This DHQ can be modified by addition or deletion of items. Nutrient intake is calculated from reported food intake using the Diet*Calc Analysis Program (Version 1.3.2. National Cancer Institute, Applied Research Program. June 2003) using the DHQ Nutrient Database (DHQ Nutrient Database. dhq1_011703.csv. National Cancer Institute, Applied Research Program).

WHEEL Program Development The intervention was developed by Drs. Kinney, Murtaugh, and Ms. Webber based upon the information culled from focus groups and questionnaires administered at the focus group sessions. The pilot study was designed to include baseline measurements of height, weight, waist and hip circumferences. The WHEEL questionnaire was designed to be administered at baseline and after the 12 week program.   The intervention includes reinforcing factors and removal of barriers, such as a grocery list of food items that can be purchased before the trip and supplemented with foods that are available. One session of the program is designed to inform participants how the weight loss goal is related to conditions that may limit driver certification, e.g. diabetes and hypertension (Eating Healthy to Keep you on the Road).

Dissemination of Information
Besides standard peer reviewed publications, we will disseminate results to employees of the trucking companies, as well as to companies‟ management (in aggregate). This has already begun. We plan on using the information gained in the course of this research investigation in our free RMCOEH Outreach programs (e.g., a one hour lecture). We plan to disseminate the results through trade newsletters (e.g., Utah Trucking Association, Wisconsin Motor Carriers Association).

Recruitment
Commercial Truck Drivers were contacted via posters, email, or the company‟s usual communication mode if otherwise, to be invited to enroll and complete the Questionnaire and other enrollment procedures. All of the drivers at the major companies used email and had access to computers at the truck company headquarters; many have their own computers to use on the road. In addition, in-person recruitment was done at trade shows in Kentucky, Iowa, Illinois, Nevada, Utah, and Texas as well as company quarterly safety meetings, and other face-to-face contact opportunities at local truck stops in Utah and Wisconsin. Recruitment was ongoing over a two-year period. Incentives include individualized feedback on body weight, blood pressure, lipid panel, glucose, hemoglobin A1c, urinalysis, and a $20 gift card.

Participants in the focus groups were recruited by email contact, personal invitation at safety meetings, and other face-to-face contact opportunities developed with the companies. Participants of focus groups were offered $20 gift certificates to local grocery or department stores (e.g. Target or Walmart) for participation.

Statistical Analysis
Descriptive statistics were utilized to describe characteristics of Commercial Truck Drivers from the Questionnaire. Univariate and multivariate logistic regression modelings were utilized to estimate odds ratios and 95% confidence intervals for statistically significant relationships that are between independent factors (e.g. age, Body Mass Index, total cholesterol, physical activity, nutritional variables) and dependent variables (e.g. diabetes). Multivariate logistic regression modeling includes forced variables that have been repeatedly implicated for the selected outcomes based on priori studies (e.g. age) and stepwise inclusion or exclusion of remaining variables of interest as identified by univariate analyses. The final model was based upon goodness of fit statistics.

Focus group data included responses to open-ended questions, which were examined using qualitative analysis techniques. First, responses were reviewed several times by two independent reviewers so that we became familiar with content area issues concerning each of the individual, interpersonal, provider- and system-level, and environmental/cultural factors. Content analyses were conducted on responses, especially those concerning attitudes and categories was created and descriptive data was generated with advice and direction from Dr. Kinney. Preliminary codes were assigned. All open-ended items was coded by the Study Coordinator and reviewed by Dr. Murtaugh. Inter-rater reliability (see below) was calculated and discrepancies were discussed, followed by appropriate revision of the categories and codes. Chronbach"s Alpha, Cohen"s Kappa statistics and correlation was utilized as appropriate for qualitative data.

Strengths and Limitations
The strengths of this proposal were the understudied and medically underserved population of Commercial Truck Drivers. Prior published data suggest that they have health needs that far exceed those of the general population, although that has not been well measured. Quantification of the prevalence rates and analyses of the risk factors among a large population of Commercial Truck Drivers was and is needed.

Trucking firms are concerned about both health care and Workers" Compensation costs and were interested in partnering with the University of Utah and the University of Wisconsin-Milwaukee to analyze these problems and develop an appropriate intervention. These companies generally have some resources, but no significant Health Promotion Program that truck drivers were engaged in. This provided (and still provides) excellent opportunity(ies) for the development of a well-founded Health Promotion Program that specifically targets this population of workers. The commitments are indicated by such statements as from one of the trucking company"s director of Human Resources and Risk Management who said "I"d rather pay people $100 to reach their goals in a weight loss program than spend $100 on health insurance or Workers" compensation". These partnerships have excellent chances for successes.

Limitations include the highly mobile truck driver population and potential for relatively biased participants based on the methods used. We had not originally planned on enrollments from trucking shows, but this became a major enrollment venue based on need. On the other hand, the very poor health indicators (e.g., BMI and blood pressure measures compared with other studies) suggest this

method of enrollment still met the needs of measuring the population. We pre-planned these potential weaknesses and addressed them by providing drivers a $20 gift card as incentive for their participation. This group of researchers is/was experienced in recruitment of underserved populations including African Americans, Latinos and Native Americans.

Results

A total of 817 U.S. truck drivers participated in this study, including 705 (86.3%) males and 112 (13.7%) females (See Appendix 1). Participant"s commercial driver licenses were amazingly registered in <u>46 different U.S. states.</u> Drivers were on average 47.3±10.5 years old and the median age was 48.4 years. The majority of drivers were white/Caucasian (86.4%). Most had at least a high school education (88.6%). There was a broad range of self-reported incomes, with most being between $25,000 and $75,000 per year (513 participants, 62.79%)

Drivers were on average (±SD) 177.47(±8.94) cm tall, and weighed 103.50 (± 23.94) kg. Mean hip circumference was 114.43 (± 13.93) cm, waist circumference was 113.22 (± 17.18) cm, chest circumference was 114.02 (± 12.80) cm, and neck circumference was 42.43 (± 4.45) cm. Body mass indices (BMI) were also calculated across the population, and a clear majority of drivers were overweight or obese (62.0%). The mean BMI was 32.88 (± 7.40) kg/m^2. Most (62.1%) of the population was obese with a BMI greater than or equal to 30 kg/m².

Systolic blood pressure was 131.9 (± 19.28) mm HG and diastolic blood pressure was 84.25 (± 10.66) mm HG. Mean total cholesterol was 191.99 (± 1.2) mg/dL. Triglycerides were 227.37 (± 139.4) mg/dL. LDL cholesterol averaged 112.98 (± 4.1) mg/dL and HDL cholesterol was 36.5 (± 14.1) mg/dL. Glycosylated hemoglobin A1 C was an average of 5.0% at a standard deviation of 1.2%. Pack years of cigarette use was 8.9 (± 13.2) pack years the mean number of minutes per week of total physical activity is 322.5 (± 373.1) min. per week.

The modified Zung depression composite score had a mean value 5.6 (± 3.8) and modified Apgar composite score of social support had a mean value of 3.4 (± 3.0) and anxiety composite score was calculated and had a mean value of 5.7 (± 1.0). Mean hours worked per week was 57.9 (± 21.0) hours and a total drive time hours per week was 57.4 (± 18.4) hours per week. The average time until break was 5.4 (± 2.5) hours an average break length was 2.4 (± 3.7) hours. In the mean number of years working at their current company was 7.3 (± 8.8) years.

There was a wide range of career mileage reported with 96 (11.8%) reporting one quarter million miles or less, 67 (8.2%) reported about a half million miles, 66 (8.1%) reported about three quarter million miles, 143 (17.5%) reported about 1,000,000 miles, 128 (15.7%) reported about 2,000,000 miles, 117 (14.3%) reported about 3,000,000 miles, 54 (6.6%) reported about 4,000,000 miles, 47 (5.8%) reported 5,000,000 miles or more. 99 (12.1%) reported not knowing the approximate career mileage.

Drivers worked a range of times with 289 (35.4%) driving mostly during the day 63 (7.7%) driving at night 252 (30.8%) driving both day and night and 252 (3.8%) reported variable driving times. The majority of the drivers (546, 66.8%) reported long-haul driving while 229 (20.0%) reported short-haul and 42 (5.1%) reported haul type as something other than long and short haul.

Medical history

520 drivers (14.7%) reported having been diagnosed with sleep apnea and 414 (50.7%) self-reported having been told they snore at night and 406 (49.7%) reported regular tobacco usage. Many drivers, 480 (58.8%), reporting have reported having had health insurance. Few drivers reported having been diagnosed with low back pain 114 (14.0%), however a large proportion reported having had low back

pain lasting at least one day in the past year 394 (48.3%). A low number of drivers 17 (2.1%) reported having a history of a dependence problem with narcotics. Few drivers, 51 (6.2%) reported having been diagnosed with heart rhythm problems and a smaller proportion, 31 (3.8%) had been diagnosed with a heart attack. Twenty four (2.9%) had had heart surgery however 50 (6.1%) were diagnosed with cardiovascular disease. Only one driver was diagnosed with epilepsy and 77 drivers (9.4%) were diagnosed with having an eye disorder.

Psychosocial factors

In response to the question how often do you have family problems that irritate or bother you 96 drivers (35.1%) reported never, 442 drivers (54.2%) reported occasionally 66 drivers (8 .1%) reported often and 22 drivers (2.7%) reported always. Responding to the question "In the past year, how often do you feel down blue or depressed", 347 (42.5%) reported never, 381 (46.6%) reported seldom 76 (9.3%) reported often and 13 (1.6%) reported always. The question how often you feel on the edge 385 (47.1%) reported never 324 (39.7%) reported seldom 99 (12.1%) reported often and nine (1.1%) reported always. Respondents to the question how often you feel tense 277 (33.9%) reported never 390 (47.7%) reported seldom 137 (16.8%) reported often and 13 (1.6%) reported always. In response to the question how often you feel uneasy 380, 343 (42.0%) reported seldom, 86 (10.5%) reported often, and eight (1.0%) reported always. Respondents reported never (162, 19.8%), seldom (383, 46.9%), often (215, 26.3%), and always (57, 7.0%) feeling mentally exhausted after work. In response to question how often you feel physically exhausted after work 125 (50.3%) reported never, 451 (55.2%) reported seldom, 180 (22.0%) reported often been 61 (7.5%) reported always. In response to the question how often would you say that your job was very physically hard 161 (19.7%) reported never, 419 (51.3%) reported seldom, 169 (20.7%) reported often, and 68 (8.3%) reported always. Response question does your job require and lumping activities 243 (29.8%) reported yes however in response to the question job requires manual lifting hundred 90 (23.3%) reported yes.

Crashes and near misses
There was a wide range of responses to the question how many reportable crashes have you had in your career and a majority of drivers (491, 60.1%) reported zero reportable crashes in their career. Of the remaining 326 drivers a crash 188 (23.0% of the total, 57.7% of those with a crash) reported one crash, 84 (10.3% of the total, 25.8% of those with a crash) reported two crashes, 37 (4.5% of the total, 11.4% of those with a crash) reported three crashes, seven (0.9% of the total, 2.2% of those with a crash) reported for crashes, six (0.7% of the total, 1.8% of those with crashes) reported five crashes, and four (0.5% of the total, 1.2% of those with crashes) had six or more crashes in their career. Similarly there were a wide range of our sponsors to the question of how many near misses have you had in the past year.

There were many statistically significant relationships between being involved in that reportable crash and personal factors psychosocial factors and occupational factors (See Appendix 2). For every year increase in age there was a statistically significantly increase risk for being involved in the crash with the odds ratio (OR) = 1.03 (95% CI 1.01, 1.04) per year. For every year increase in total professional drive time was a statistically significant relationship with being involved in a crash with an OR = 1.04 (95% CI 1.03, 1.06).

Being female gender was statistically significantly protective as compared to males with an OR = 0.48 (95% CI 0.31, 0.75). Self-reported snoring at night was an increase risk of being involved in a reportable crash with an OR 1.40 (95% CI 1.04, 1.83) as compared to not having self-reported

snoring at night. Drive time was statistically significantly related to being involved in a reportable crash with primarily nighttime driving being statistically significantly protective as compared to primarily day driving with an OR of 0.43 (95% CI 0.22, 0.82).

Self-reported low back pain were statistically significantly related to being involved in reportable crash with an OR of 1.50 (95% CI 1.10, 1.94) as compared to not having low back pain. Health insurance was statistically significantly related to being involved in a reportable crash with those having health insurance were 1.48 times more likely to be involved in the crash (95% CI 1.11, 1.98) as compared to those without health insurance. Those reporting having been diagnosed with cardiovascular disease were statistically significantly more likely to have been involved in a reportable crash with an OR = 2.00 (95% CI 1.13, 3.57) as compared to those who were not diagnosed with cardiovascular disease.

Those drivers who report using a cell phone in a city were statistically significantly more likely to be involved in a reportable crash. Risk estimates for cell use were 1) once a week (OR = 2.44, 95% CI 1.27, 4.68), 2) 2 to 3 times a week (OR = 2.66, 95% CI 1.54, 4.61), 3) 4 to 6 times a week (OR = 2.27, 95% CI 1.21, 4.26),4) once a day (OR = 1.75, 95% CI = 0.99, 3.10), or 5) more than once a day (OR = 2.25, 95% CI = 1.55, 3.26) as compared to those who reported never using a cell phone in a city. Statistical significant factors were found in self-reported usage of cell phone in a rural area; however there was less statistical significance. Risk estimates for categories of use of cell phone in rural areas were 1) 2 to 3 times a week at an OR of 1.54 (95% CI 0.86, 2.76), 2) 4 to 6 times a week have an OR of 1.89 (95% CI 1.02, 3.49), 3) once a day have an OR of 1.71 (95% CI 0.95, 3.09), and 4) more than once a day have an OR of 2.31 (95% CI 1.54, 3.46) as compared to never using a cell in a rural area. For self-reported sending texts while in the city the only statistically significant relationship was comparing those who report texting once a week with an OR 3.00 (95% CI 1.01, 8.88) as compared to never texting in the city. For texting in a rural area there were no statistically significant relationships. Drivers who reported regularly manual loading and unloading of their trucks (lumping activities) had a nearly statistically significant relationship with reportable crashes with an OR 1.30 (95% CI 0.96, 1.77).

Psychosocial factors
For those who report occasionally having family problems were statistically significantly more likely to be in a reportable accident as compared to those who never report family problems with an OR of 1.55 (95% CI 1.14, 2.11). For those who reported often feeling tense they were statistically significantly more likely to be involved in reportable crash with an OR of 1.74 (95% CI 1.15, 2.64) as compared to never feeling tense. Similarly, drivers who reported often feeling uneasy were statistically significantly more likely to be involved in a reportable crash with an OR of 1.82 (95% CI 1.13, 2.91) as compared to never feeling uneasy. Self-reported physical exhaustion after work was statistically significantly related to being involved in a reportable crash as compared to never feeling physically exhausted after work those who reported feeling seldom have an OR of 1.60 (95% CI 1.04, 2.45), often had an OR of 1.95 (95% CI 1.20, 3.16), and always had an OR of 1.89 (95% CI 1.00, 3.56). While not statistically significant, there was a trend towards statistical significance four responses to the question about being mentally exhausted after work in relationship to reportable crash. Those drivers who reported always feeling mentally exhausted after work had an OR of 1.78 (95% CI 0.97, 3.27) as compared to those who reported never feeling mentally exhausted. Seldom and often feeling mentally exhausted were not statistically significant.

Factors including job requiring manual lifting, the amount of fat in their diet, metabolic syndrome, feeling depressed, feeling on the edge, being diagnosed with an eye disorder, having had heart

surgery in the past, having had a heart attack in the past, having problems with narcotics, physical activity, tobacco use, haul type, race, education, income, marital status, obesity, alcohol consumption, and self-reported sleep apnea were all statistically negative, although statistical trends may exist.

Additional factors including average break length, driving time until break, and total amount of drive were not statistically significant.

Focus Group Data
The drivers universally desired good health. However, few reported seeking health care on a consistent basis. In fact some identified gaps in visits to a physician in excess of 10 years, excepting their Transportation Safety mandated exam. Some drivers reported that they had health insurance, however, many did not. Barriers to obtaining health care included their schedules and the nature of their jobs. In general, drivers were not aware of healthy weight. One driver who appeared to be obese indicated that he believed he did not have a weight problem but other drivers who weighed 300 pounds and more were the ones with a problem.

Although many drivers were able to identify healthy foods, the scope of what was healthy ranged from processed vs. unprocessed foods, to specific foods or popular media related diet concepts. Barriers to obtaining healthy foods included cost, logistics of their job, time constraints, difficulty parking their truck at healthy food outlets (stores and restaurants), and having limited storage and cooking facilities in their trucks. Many reported few healthy foods available, but few had tried the items that were designated healthy on menus. Some reported that they would not order the healthy items because they would not be filled up and it would cost them more. Others who had tried them cited taste or flavor was unacceptable. Only one driver was vocal about eating whatever he wanted to until he has a problem like a heart attack; interestingly, this driver appeared to be of healthy weight. Drivers did not appear to know or understand what their dietary energy intake should be.

Drivers reported walking as the most common activity. Some voiced fears about getting hurt while exercising on the road. Many voiced barriers including time, lack of gyms and shower facilities. Although they agreed that showers are available at many truck stops, they report waiting in line for hours to get a shower. Limited availability of workout locations and equipment was a universal barrier. Nearly all felt that someone should provide gyms with adequate showers and equipment for them and most thought that it should be truck stop owners/companies. National gym companies were not viewed as attractive options because parking their truck was an issue.

Walmart was identified as a truck friendly location except in a few cases where a specific Walmart store was fed-up with drivers treating the parking areas with disrespect (throwing trash out the window as an example).

Discussion.

This study successfully enrolled a total of 817 U.S. truck drivers. This occurred despite considerable difficulties that initially included obtaining the Certificate of Confidentiality and then problems with access to truck drivers. The Certificate was felt to be needed due to the major liability exposures associated with truck crashes (may be over $30M/crash).

The descriptive data suggest the population likely is representative of the overall trucking population. This study"s demographic characteristics of the population were predominantly male (86.3%) and the mean age was 47 yrs. The drivers were from nearly all US states. The typical truck driver was overweight or obese (62%) with a mean BMI of 32.9kg/m^2, which is considerably higher than the overall population"s rate of obesity. The blood pressure measures were somewhat high. Triglycerides were elevated. Tobacco use was nearly half at 49.7%. There was a considerable range in psychological measures.

Job factors included a rather high number of hours worked per week (mean 57.9 hrs). There was a tremendously diverse range in career mileage with the mode of 1M miles driven. A sizable majority classified their work as long-haul (66.8%).

Medical disorders were common, which is unsurprising considering the degree of obesity and other risk factors. Fully 520 drivers (14.7%) reported having been diagnosed with sleep apnea and 414 (50.7%) self-reported having been told they snore at night. Few drivers reported having been diagnosed with low back pain 114 (14.0%), however a large proportion reported having had low back pain lasting at least one day in the past year 394 (48.3%).

Cardiac issues were uncommon, but not rare. Problems included heart rhythm issues (6.2%), cardiovascular disease (6.1%) and heart attacks (3.8%). This overall prevalence rate was not surprising as the drivers were mostly too young to have developed clinical cardiovascular disease. It is actually somewhat surprising that the rate was as high as 6.1%.

Sizable numbers of drivers reported prior crashes, with 23.0% having had one crash and 16.9% having had more than one crash.

Risks for crashes included: age, male, snoring at night, primarily daytime driving, low back pain, cardiovascular disease, and cell phone use. Psychosocial factors associated with crashes included a history of family problems, measures of anxiety, feeling physical exhausted after work,

Data suggest improvements in the commercial driver medical examination should include many more detailed questions that would include: separate cardiovascular disease from other cardiac disorders; isolate snoring as its own question; ask about sleep apnea as its own question; separating psychological disorders into anxiety, depression and other psychological issues; and querying prior crashes.

Focus group participants universally desired good health. However, beliefs and actions did not necessarily match. Some had not been examined by a physician in over 10 years, aside from the Commercial Driver Medical Examinations. Awareness of healthy weight was poor. Identification of healthy food choices was suboptimal. Barriers to healthy eating and exercising on the job were identified. There was widespread lack of understanding of metabolic demand and matching food

consumption to that demand. This research project successfully defined a health promotion program that was tailored for the unique environment confronting truck drivers.

Conclusions.

The population of Commercial Truck Drivers included in this sample appear likely be generalized to the larger commercial driver population based on study sample methods and comparability of these data to other studies" data. These data demonstrate that there are many morbid health conditions and associated factors that are elevated in this population. These factors pose a potential source of intervention focal points that if significantly influenced could improve the health and reduce injuries among drivers. Additionally, qualitative data from focus groups demonstrate that there are significant perceived barriers to healthy lifestyle activities, including eating and physical activity, for these drivers. Some problems appear solvable, but some problems will be challenging.

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Publications.

Publications are in progress. There are 3 manuscripts that are in various phases of development and peer review. There are none yet accepted for publication.

Department of Health and Human Services
Final Invention Statement and Certification
(For Grant or Award)

DHHS Grant or Award No.
OH009155

A. We hereby certify that, to the best of our knowledge and belief, all inventions are listed below which were conceived and/or first actually reduced to practice during the course of work under the above-referenced DHHS grant or award for the period

09/01/2007   through   08/31/2010 .

original effective date   *date of termination*

B. Inventions (Note: If no inventions have been made under the grant or award, insert the word *"NONE"* under Title below.)

NAME OF INVENTOR	TITLE OF INVENTION	DATE REPORTED TO DHHS
	NONE	

(Use continuation sheet if necessary)

C. Signature — This block *must* be signed by an official authorized to sign on behalf of the institution.

Title	Name and Mailing Address of Institution
Signing Official	University of Utah
Typed Name	c/o Technology Commercialization Office
Leslie J. Smith	615 Arapeen Drive, Suite #310
	Salt Lake City, UT 84108

Signature	Date
[signature]	4/16/2013

CDC Procurement & Grants Office – Branch V
Equipment Inventory Listing

Report Date:	October 16, 2012				Grant Number:	1R01OH009155-01		
Project Title:	Preventing Work Injuries &				Project Period:	9/1/2007 - 8/31/2010		
Grantee Name:					Project Officer:	Kurt T. Hegmann		
Grants Management Officer:					Grants Specialist:			

Description of Item: i.e. pH Meter	Mfr.[a] i.e. Fischer	Serial Number	Quantity	Condition[b]	Location[c]	Purchase Cost	Date Received [mm/dd/yyyy]
NONE							

[a] Mfr: (Manufacturer)
[b] Condition: (Excellent) (Good) (Fair) (Poor) (Inoperable)
[c] Location: complete physical address

Property Administrator & PO Disposition Recommendation and Instructions:

Description of Item	Disposition[1]	Address[2]
[Copy from above] 	___ Transfer Title ___ Retain and Compensate Awarding Agency ___ Return to Program Office ___ Other (explain)	Attn: [Project Officer] CDC / NIOSH 1600 Clifton Road, NE MS E-74 Atlanta, GA 30329-4018
[Copy from above] 	___ Transfer Title ___ Retain and Compensate Awarding Agency ___ Return to Program Office ___ Other (explain)	

[1] Check the appropriate disposition
[2] CDC Warehouse is the central receiving point for delivery of all non-hazardous and non-perishable supplies and equipment, CDC – AM–2804-03, update 2010

From: Toni Chambers
Sent: Wednesday, April 17, 2013 9:14 AM
To: Monroe, Maryann P. (CDC/OCOO/PGO); Kurt Hegmann; Matt Thiese
Cc: Deanne Clegg
Subject: RE: Grant OH009155 - Equipment/Property Question

Maryann,
Attached is the "Final Invention Statement" and the answer to the question; "Was there any equipment/property greater than $5,000 remaining on this project?" Is NO.

Any questions or concerns please let us know.

Regards,

Toni Chambers
Program Coordinator
University of Utah
RMCOEH
391 Chipeta Way, Suite C
Salt Lake City, UT 84108
(801) 581-4800
Fax: (801) 581-7224

Inclusion of Gender and Minority Subjects.
Inclusion of Children. Not applicable (children under age 21 are not eligible for commercial motor vehicle licenses.)

Appendix 1

Table 1. Descriptive statistics for Commercial Truck Drivers

Table 2. Univariate relationships between factors and reported crashes.

Table 1, Descriptive Statistics for Commercial Truck Drivers

Categorical Variables n(%)		Total
Gender	Male	705 (86.29)
	Female	112 (13.71)
Race	White	706 (86.41)
	African American	36 (4.41)
	Hispanic or Latino	48 (5.88)
	Native American or Alaskan Native	10 (1.22)
	Native Hawaiian or Pacific Islander	2 (0.24)
	Other	10 (1.22)
	Declined	3 (0.37)
Education	8th Grade or Less	16 (1.96)
	Some High School	77 (9.42)
	High School Graduate or GED	329 (40.27)
	Some College	327 (40.02)
	College Graduate (Bachelor's Degree or Higher)	68 (8.32)
Income	Less than or equal to $25,000	47 (5.75)
	$25,001 to $50,000	255 (31.21)
	$50,001 to $75,000	258 (31.58)
	$75,001 to $99,999	78 (9.55)
	$100,000 or more	133 (16.28)
	Decline to answer	46 (5.63)
Marital Status	Divorced	163 (19.95)
	Married	501 (61.32)
	Never Married (Single)	120 (14.69)
	Separated	20 (2.45)
	Widowed/Widowed	13 (1.59)
Measured Body Mass Index (kg/m2)	Underweight (<18.5)	2 (0.24)
	Normal weight (25.0 to <25.0)	83 (10.16)
	Overweight (25.0 to <30.0)	225 (27.54)
	Obese (30.0 to <35.0)	393 (48.10)
	Morbid Obese (≥35)	114 (13.95)
Obesity (BMI ≥ 30 kg/m2)	Yes	507 (62.06)
	No	310 (37.94)
Alcohol Consumption	Yes	483 (59.12)
	No	334 (40.88)
Alcohol Consumption Per Week	<1	291 960.25)
	1-2	94 (19.46)
	3-5	48 (9.94)
	6-11	31 (6.42)
	12-17	8 (1.66)
	18-23	4 (0.83)
	24-29	5 (1.04)
	30+	2 (0.41)

Diagnosed Sleep Problems	Yes	100 (12.24)
	No	717 (87.76)
Self Reported Sleep Apnea	Yes	120 (14.69)
	No	697 (85.31)
Self Reported Snoring at night	Yes	414 (50.67)
	No	403 (49.33)
Self Report Diagnosis of Diabetes Mellitus	Yes	88 (10.77)
	No	729 (89.23)
Self Report Diagnosis of High Blood Pressure	Yes	237 (29.01)
	No	580 (70.99)
Self Report Diagnosis of High Cholesterol (>200 mg/dL)	Yes	219 (26.81)
	No	598 (73.19)
Career Mileage	1/4 Million Miles of Less	96 (11.75)
	1/2 Million Miles	67 (8.20)
	3/4 Million Miles	66 (8.08)
	1 Million Miles	143 (17.50)
	2 Million Miles	128 (15.67)
	3 Million Miles	117 (14.32)
	4 Million Miles	54 (6.61)
	5 Million Miles or More	47 (5.75)
	Unknown	99 (12.12)
Shift Work	Day Shift	289 (35.37)
	Night Shift	63 (7.71)
	Swing Shift	252 (30.84)
	Variable Shift	213 (26.07)
Haul Type	Long Haul	546 (66.83)
	Short Haul	229 (28.03)
	Other	42 (5.14)
Number of Reportable Crashed	0	491 (60.10)
	1	188 (23.01)
	2	84 (10.28)
	3	37 (4.53)
	4	7 (0.86)
	5	6 (0.73)
	6 or More	4 (0.49)
Tobacco Usage	Yes	406 (49.69)
	No	411 (50.31)
Family Problems	Always	22 (2.70)
	Never	286 (35.05)
	Occasionally	442 (54.17)
	Often	66 (8.09)
Self Report Exercise	Yes	471 (57.65)
	No	346 (42.35)
Self reported Low Back Pain	Yes	114 (13.95)

	No	703 (86.05)
Texting In the City	Never (0 times)	693 (84.82)
	Once a day	11 (1.35)
	Once a week	15 (1.84)
	More than once a day	46 (5.63)
	Less than once a month	23 (2.82)
	2-3 times a week	18 (2.20)
	4-6 times a week	11 (1.35)
Texting in Rural Areas	Never (0 times)	670 (82.01)
	Once a day	15 (1.84)
	Once a weeks	19 (2.33)
	More than once a day	52 (6.36)
	Less than once a month	24 (2.94)
	2-3 times a week	23 (2.82)
	4-6 times a week	14 (1.71)
Apgar Job	Almost Always	545 (66.71)
	Hardly Ever	23 (2.82)
	Some of the Time	249 (30.48)
Apgar Emotion	Almost Always	359 (43.94)
	hardly Ever	150 (18.36)
	Some of the Time	308 (37.70)
Apgar Help	Almost Always	422 (51.65)
	hardly Ever	150 (18.36)
	Some of the Time	245 (29.99)
Apgar Share	Almost Always	360 (44.06)
	hardly Ever	183 (22.40)
	Some of the Time	274 (33.54)
Apgar Support	Almost Always	351 (42.96)
	hardly Ever	134 (16.40)
	Some of the Time	332 (40.64)
Agpar Talk	Almost Always	396 (48.47)
	hardly Ever	150 (18.36)
	Some of the Time	271 (33.17)
Health Insurance	Yes	480 (58.75)
	No	337 (41.25)
Back Pain lasting at least 1 day	Yes	394 (48.28)
	No	422 (51.72)
Felt Depressed	Always	13 (1.59)
	Never	347 (42.47)
	Often	76 (9.30)
	Seldom	381 (46.63)
Felt on the Edge	Always	9 (1.10)
	Never	385 (47.12)
	Often	99 (12.12)

	Seldom	324 (39.66)
Felt Tense	Always	13 (1.59)
	Never	277 (33.90)
	Often	137 (16.77)
	Seldom	390 (47.74
Felt Uneasy	Always	8 (0.98)
	Never	380 (46.51)
	Often	86 (10.53)
	Seldom	343 (41.98)
Zung Nervous	A moderate amount of time (3-4 times per week)	63 (7.71)
	Most of the time (5-7 days per week)	30 (3.67)
	Rarely or none of the time (less than 1 day per week)	524 (64.14)
	Some or little of the time (1-2 days per week)	200 (24.48)
Zung Cares	A moderate amount of time (3-4 times per week)	40 (4.90)
	Most of the time (5-7 days per week)	22 (2.69)
	Rarely or none of the time (less than 1 day per week)	631 (77.23)
	Some or little of the time (1-2 days per week)	124 (15.18)
Zung Eat	A moderate amount of time (3-4 times per week)	165 (20.20)
	Most of the time (5-7 days per week)	214 (26.19)
	Rarely or none of the time (less than 1 day per week)	213 (26.07)
	Some or little of the time (1-2 days per week)	225 (27.54)
Zung Enjoy	A moderate amount of time (3-4 times per week)	167 (20.44)
	Most of the time (5-7 days per week)	413 (50.55)
	Rarely or none of the time (less than 1 day per week)	105 (12.85)
	Some or little of the time (1-2 days per week)	132 (16.16)
Zung Hopeful	A moderate amount of time (3-4 times per week)	178 (21.79)
	Most of the time (5-7 days per week)	416 (50.92)
	Rarely or none of the time (less than 1 day per week)	84 (10.28)
	Some or little of the time (1-2 days per week)	139 (17.01)
Zung Irritable	A moderate amount of time (3-4 times per week)	80 (9.79)
	Most of the time (5-7 days per week)	34 (4.16)
	Rarely or none of the time (less than 1 day per week)	485 (59.36)
	Some or little of the time (1-2 days per week)	218 (26.68)
Zung Sad	A moderate amount of time (3-4 times per week)	54 (6.61)
	Most of the time (5-7 days per week)	16 (1.96)
	Rarely or none of the time (less than 1 day per week)	611 (74.79)
	Some or little of the time (1-2 days per week)	136 (16.65)
Zung Tired	A moderate amount of time (3-4 times per week)	59 (7.22)
	Most of the time (5-7 days per week)	23 (2.82)
	Rarely or none of the time (less than 1 day per week)	549 (67.20)
	Some or little of the time (1-2 days per week)	186 (22.77)
Zung Useful	A moderate amount of time (3-4 times per week)	174 (21.30)
	Most of the time (5-7 days per week)	427 (52.26)
	Rarely or none of the time (less than 1 day per week)	112 (113.71)

	Some or little of the time (1-2 days per week)	104 (12.73)
Cell usage in the City	Never (0 times)	216 (26.44)
	Once a day	68 (8.32)
	Once a week	46 (5.63)
	More than once a day	319 (39.05)
	Less than once a month	46 (5.63)
	2-3 times a week	72 (8.81)
	4-6 times a week	50 (6.12)
Cell usage in Rural area	Never (0 times)	155 (18.97)
	Once a day	72 (8.81)
	Once a weeks	33 (4.04)
	More than once a day	392 (47.98)
	Less than once a month	25 (3.06)
	2-3 times a week	77 (9.42)
	4-6 times a week	63 (7.71)
Diagnosed with Cardiovascular Disease	Yes	50 (6.12)
	No	767 (93.88)
Epilepsy	Yes	1 (0.12)
	No	816 (99.88)
Eye disorder	Yes	77 (9.42)
	No	740 (90.58)
Hip to Waist Ratio	<0.8	13 (1.59)
	≥0.8	804 (98.41)
	<1.0	451 (55.20)
	≥1.0	366 (44.80)
Fat in diet	Low	106 (12.97)
	Medium	513 (62.79)
	High	198 (24.24)
Number of Metabolic risk factors (our of five)	0	41 (5.02)
	1	130 (15.91)
	2	218 (26.68)
	3	276 (33.78)
	4	116 (14.20)
	5	36 (4.41)
Metabolic Syndrome	Yes	428 (52.39)
	No	389 (47.61)
Meet waist circumference risk factor	Yes	634 (77.60)
	No	183 (22.40)
Meet low HDL risk factor	Yes	580 (70.99)
	No	237 (39.01)
Meet high triglyceride risk factor	Yes	552 (67.56)
	No	265 (32.44)
Meet High Blood pressure risk factor	Yes	175 (21.42)
	No	642 (78.58)

		Total
Meet high HbA1c risk factor	Yes	97 (11.87)
	No	720 (88.13)
Physically exhausted after work	Always	61 (7.47)
	Never	125 (15.30)
	Often	180 (22.03)
	Seldom	451 (55.20)
Mentally Exhausted after work	Always	57 (6.98)
	Never	162 (19.83)
	Often	215 (26.32)
	Seldom	383 (46.88)
Self Report Problem with Narcotics	Yes	17 (2.08)
	No	800 (97.92)
Self Report Heart Rhythm problems	Yes	51 (6.24)
	No	766 (93.76)
Self Report Diagnosis of Heart Attack	Yes	31 (3.79)
	No	786 (96.21)
Self Report Past Heart Surgery	Yes	24 (2.94)
	No	793 (97.06)
Job requires them to work very hard physically	Always	68 (8.32)
	Never	161 (19.71)
	Often	169 (20.69)
	Seldom	419 (51.29)
Lumping activities	Yes	243 (29.78)
	No	573 (70.22)
Job requires manual lifting	Yes	190 (23.26)
	No	627 (76.74)

Continuous Variables (mean ± SD)   **Total**

Continuous Variables (mean ± SD)	Total
Age	47.27 ± 10.51
Weight (kg)	103.50 ± 23.95
Height (cm)	177.47 ± 8.94
Body mass index	32.88 ± 7.40
Waist circumference (cm)	113.22 ± 17.18
Hip circumference (cm)	114.43 ± 13.93
Chest circumference (cm)	114.02 ± 12.80
Neck circumference (cm)	42.43 ± 4.45
Systolic blood pressure (mm Hg)	131.90 ± 17.28
Diastolic blood pressure (mm Hg)	84.25 ± 10.66
Total cholesterol	191.99 ± 41.18
Triglycerides	227.37 ± 139.38
LDL cholesterol	112.98 ± 34.05
HDL cholesterol	36.46 ± 14.09
Hemoglobin A1c	5.01 ± 1.22
Apgar composite score	3.42 ± 3.02

Hours worked per week	57.88 ± 20.99
Pack years	8.86 ± 19.16
Total drive time (hours per week)	57.43 ± 19.41
Total work time at current company (years)	7.33 ± 8.76
Total professional drive time (years)	17.16 ± 11.80
Modified Zung Depression Composite score	5.64 ± 3.80
Felt nervous, anxious, depressed Composite Score	5.67 ± 1.00
Total physical activity (min. per week)	322.51 ± 373.08
Hip to waist ratio (cm)	0.99 ± 0.85
Average break length (hours)	2.41 ± 3.73
Time until break (hours)	5.35 ± 2.52

Table 2. Univariate Relationships between factors and crash risk.

Continuous Variables (per unit increase)	Odds Ratio Estimates	95% CI
Age (years)	1.03	(1.01, 1.04)*
Weight (kg)	1.00	(1.00, 1.01)
Height (cm)	1.02	(1.01, 1.04)*
Body mass index (kg/m2)	1.01	(0.99, 1.02)
Waist circumference (cm)	1.00	(1.00, 1.01)
Hip circumference (cm)	1.00	(0.99, 1.01)
Hip to waist ratio (cm)	4.63	(0.88, 24.42)
Chest circumference (cm)	1.00	(0.99, 1.01)
Neck circumference (cm)	1.03	(1.00, 1.06)
Systolic blood pressure (mm Hg)	1.01	(1.00, 1.01)
Diastolic blood pressure (mm Hg)	1.00	(0.98, 1.01)
Total cholesterol (mg/dl)	1.00	(1.00, 1.00)
Triglycerides (mg/dl)	1.00	(1.00, 1.00)
LDL cholesterol (mg/dl)	1.00	(1.00, 1.01)
HDL cholesterol (mg/dl)	0.99	(0.99, 1.00)
Hemoglobin A1c (%)	1.08	(0.96, 1.21)
Pack years of Cigarette use	1.00	(0.99, 1.01)
Total physical activity (min. per week)	1.00	(1.00, 1.01)
Apgar composite score	1.03	(1.00, 1.08)
Modified Zung Depression Composite score	0.99	(0.95, 1.03)
Anxiety Composite Score	1.09	(1.00, 1.19)
Hours worked per week	1.01	(1.00, 1.01)
Total drive time (hours per week)	1.00	(1.00, 1.01)
Total work time at current company (years)	1.02	(1.00, 1.04)*
Total professional drive time (years)	1.04	(1.03, 1.06)*
Average break length (hours)	1.00	(1.00, 1.00)
Time until break (hours)	1.02	(0.96, 1.08)

Categorical Variables n(%)		Odds Ratio Estimates	95% CI
Gender	Male	1.00	Reference
	Female	0.48	(0.31, 0.75)*
Race	White	1.00	Reference
	African American	0.90	(0.45, 1.78)
	Hispanic or LatiNo	0.37	(0.18, 0.76)
	Native American or Alaskan Native	0.60	(0.16, 2.36)
	Native Hawaiian or Pacific Islander	1.41	(0.09, 22.63)
	Other	0.94	(0.26, 3.60)

	Declined	0.71	(0.06, 7.81)
Education	High School Graduate or GED	1.00	Reference
	Some High School	1.33	(0.80, 2.19)
	8th Grade or Less	0.53	(0.17, 1.68)
	Some College	1.21	(0.88, 1.65)
	College Graduate (Bachelor's Degree or Higher)	0.62	(0.35, 1.10)
Income	$50,001 to $75,000	1.00	Reference
	$25,001 to $50,000	0.92	(0.65, 1.32)
	≤ $25,000	0.73	(0.38, 1.41)
	$75,001 to $99,999	1.64	(0.98, 2.72)
	$100,000 or >	1.24	(0.81, 1.90)
	Decline to answer	0.83	(0.43, 1.60)
Marital Status	Married	1.00	Reference
	Never Married (Single)	0.76	(0.50, 1.51)
	Divorced	0.86	(0.60, 1.23)
	Separated	0.15	(0.04, 0.66)*
	Widowed/Widowed	1.17	(0.39, 3.53)
	No	1.00	Reference
Obesity (BMI ≥ 30 kg/m2)	Yes	1.13	(0.85, 1.51)
Alcohol Consumption	No	1.00	Reference
	Yes	1.30	(0.80, 1.73)
Self Reported Sleep Apnea	No	1.00	Reference
	Yes	1.23	(0.83, 1.82)
Self Reported Snoring at night	No	1.00	Reference
	Yes	1.40	(1.04, 1.83)*
Career Mileage	1 Million Miles	1.00	Reference
	1/2 Million Miles	0.57	(0.30, 1.08)
	3/4 Million Miles	0.83	(0.45, 1.53)
	1/4 Million Miles of Less	0.33	(1.18, 0.62)*
	2 Million Miles	1.29	(0.79, 2.09)
	3 Million Miles	1.88	(1.14, 3.08)*
	4 Million Miles	1.94	(1.03, 3.66)*
	5 Million Miles or More	1.49	(0.77, 2.90)
	UnKNown	0.93	(0.55, 1.75)
Shift Work	Day Shift	1.00	Reference
	Night Shift	0.43	(0.22, 0.82)*
	Swing Shift	1.01	(0.72, 1.73)
	Variable Shift	1.24	(0.87, 1.78)
Haul Type	Long Haul	1.00	Reference
	Short Haul	0.88	(0.64, 1.20)
	Other	1.48	(0.79, 2.78)
Tobacco Usage	No	1.00	Reference
	Yes	1.06	(0.80, 1.41)
Self Report Exercise	No	1.00	Reference

	Yes	0.92	(0.70, 1.22)
Self reported Low Back Pain	No	1.00	Reference
	Yes	1.50	(1.11, 1.94)*
Health Insurance	No	1.00	Reference
	Yes	1.48	(1.11, 1.98)*
Back Pain lasting at least 1 day	No	1.00	Reference
	Yes	1.12	(0.74, 1.70)
Self Report Problem with Narcotics	No	1.00	Reference
	Yes	1.06	(0.40, 2.80)
Self Report Heart Rhythm problems	No	1.00	Reference
	Yes	1.76	(1.00, 3.10)
Self Report Diagnosis of Heart Attack	No	1.00	Reference
	Yes	1.64	(0.80, 3.40)
Self Report Past Heart Surgery	No	1.00	Reference
	Yes	1.30	(0.57, 2.90)
Diagnosed with Cardiovascular Disease	No	1.00	Reference
	Yes	2.00	(1.13, 3.57)*
Eye disorder	No	1.00	Reference
	Yes	0.85	(0.52, 1.40)
Cell usage in the City	Never (0 times)	1.00	Reference
	Less than once a month	1.05	(0.52, 2.13)
	Once a week	2.44	(1.27, 4.68)*
	2-3 times a week	2.66	(1.54, 4.61)*
	4-6 times a week	2.27	(1.21, 4.26)*
	Once a day	1.75	(0.99, 3.10)
	More than once a day	2.25	(1.55, 3.26)*
Cell usage in Rual area	Never (0 times)	1.00	Reference
	Less than once a month	1.05	(0.41, 2.68)
	Once a week	1.98	(0.91, 4.31)
	2-3 times a week	1.54	(0.86, 2.76)
	4-6 times a week	1.89	(1.02, 3.49)*
	Once a day	1.71	(0.95, 3.09)
	More than once a day	2.31	(1.54, 3.46)*
Texting In the City	Never (0 times)	1.00	Reference
	Less than once a month	0.97	(0.41, 2.26)
	Once a week	3.00	(1.01, 8.88)*
	2-3 times a week	1.20	(0.47, 3.08)
	4-6 times a week	0.33	(0.07, 1.56)
	Once a day	0.56	(0.25, 2.60)
	More than once a day	0.86	(0.25, 2.96)
Texting in Rural Areas	Never (0 times)	1.00	Reference
	Less than once a month	0.60	(0.25, 1.47)
	Once a week	1.06	(0.42, 2.68)
	2-3 times a week	1.12	(0.49, 2.60)

	4-6 times a week	1.10	(0.38, 3.20)
	Once a day	0.53	(0.17, 1.69)
	More than once a day	0.84	(0.47, 1.51)
Family Problems	Never	1.00	Reference
	Occasionally	1.55	(1.14, 2.11)*
	Often	1.29	(0.74, 2.23)
	Always	1.65	(0.69, 3.95)
Felt Depressed	Never	1.00	Reference
	Seldom	1.20	(0.89, 1.61)
	Often	1.52	(0.92, 2.51)
	Always	0.51	(0.14, 1.88)
Felt on the Edge	Never	1.00	Reference
	Always	1.30	(0.34, 4.90)
	Often	1.35	(0.86, 2.11)
	Seldom	1.09	(0.80, 1.47)
Felt Tense	Never	1.00	Reference
	Seldom	1.17	(0.85, 1.61)
	Often	1.74	(1.15, 2.64)*
	Always	0.53	(0.14, 1.97)
Felt Uneasy	Never	1.00	Reference
	Seldom	1.35	(1.00, 1.82)*
	Often	1.82	(1.13, 2.91)*
	Always	0.61	(0.12, 3.04)
Fat in diet	Low	1.00	Reference
	Medium	1.36	(0.88, 2.10)
	High	1.09	(0.67, 1.78)
Number of Metabolic risk factors (our of five)	0	1.00	Reference
	1	0.88	(0.43, 1.80)
	2	0.77	(0.40, 1.52)
	3	0.88	(0.45, 1.72)
	4	1.62	(0.79, 3.33)
	5	0.90	(0.36, 2.24)
Metabolic Syndrome	No	1.00	Reference
	Yes	1.26	(0.95, 1.67)
Physically exhausted after work	Never	1.00	Reference
	Seldom	1.60	(1.04, 2.45)*
	Often	1.95	(1.20, 3.16)*
	Always	1.89	(1.00, 3.56)*
Mentally Exhausted after work	Never	1.00	Reference
	Seldom	0.94	(0.65, 1.37)
	Often	0.92	(0.61, 1.40)
	Always	1.78	(0.97, 3.27)
Job requires them to work very hard physically	Never	1.00	Reference
	Seldom	1.04	(0.71, 1.51)

	Often	1.24	(0.80, 1.93)
	Always	0.93	(0.52, 1.67)
Lumping activities	No	1.00	Reference
	Yes	1.30	(0.96, 1.77)
Job requires manual lifting	No	1.00	Reference
	Yes	1.10	(0.79, 1.52)

<u>Appendix 2</u>

Data Collection Forms

1. Baseline Questionnaire
2. Blood Results
3. WHEEL Health Status Measurements

Baseline Questionnaire

<div style="text-align:center">

PLEASE NOTE:
This will be <u>electronically
administered</u> to improve data
quality and completeness, while
shortening the time to complete
the questionnaire.

</div>

Preventing Work Injuries and Chronic Illnesses in Truckers
Baseline Questionnaire (Paper Version)

General Information Questions

1. Age: _____ (in tenths of a year, calculated automatically from Birthdate, however, birthdate is not collected in order to maintain a de-identified, HIPAA compliant, database.)

2. Gender: ____ Male ____ Female

3. What is your current marital status?
    ___ Single
    ___ Divorce
    ___ Married
    ___ Widow or Widower

4. What is your Race/Ethnicity (mark all that apply)?
    a. ___ White
    b. ___ Black or African American
    c. ___ Hispanic or Latino
    d. ___ Asian
    e. ___ Native Hawaiian or Pacific Islander
    f. ___ Native American or Alaskan Native
    g. ___ Other (please specify)
    h. ___ Wish to abstain/Decline to answer

5. Are you:
    ____ Right-handed
    ____ Left-handed
    ____ Ambidextrous

6. What is the highest grade in school that you completed?
    ____ 8th grade or less
    ____ Some high school
    ____ High school graduate or GED
    ____ Some college
    ____ College graduate (Bachelor's Degree or higher)

7. Which of the following best describes your total annual household income from all sources before taxes last year? This includes the total income before taxes from jobs, net income from business, farm, rent, pensions, dividends, welfare, social security payments and other money received by you and any other household member living with you.

    ___ $5,000 or less
    ___ Between $5,001 - $10,000
    ___ Between $10,001 - $15,000
    ___ Between $15,001 - $20,000
    ___ Between $20,001 - $25,000
    ___ Between $25,001 - $30,000
    ___ Between $30,001 - $35,000
    ___ Between $35,001 - $40,000
    ___ Between $40,001 - $50,000
    ___ Between $50,001 - $75,000
    ___ Between $75,001 - $99,999
    ___ $100,000 or more
    ___ Refuse

8. Your Company's name: _____ (select from menu) _____

9. Job Title / Department: _____

10. How long have you worked for <<company name>>? _____ years _____ months

11. How long have you worked in your current position? _____ years _____ months

12. How long have you been a professional truck driver? _____ year(s) _____ month(s)

    a. Approximately how many miles have you driven in your career? _____ million miles _____ unknown

    b. Approximately how much time do you drive each week on average? _____ hours _____ minutes

    c. Approximately how many miles do you drive in an average week? _____ miles

    d. Approximately how long do you typically drive before taking a break? _____ hours _____ minutes

    e. Approximately how long do your breaks typically last when on the road? _____ hours _____ minutes

    f. Do you typically do _____ short haul. _____ long haul. _____ other _____.

    g. How many days a month do you sleep on the road? _____ Days.

    h. Do you usually manually load or unload a truck (use a manual pallet jack lifting things over 25 pounds)?

        _____ Yes _____ No

13. What shifts do you work? ___ Day ___ Night ___ Swing

14. When driving in a city, how often do you use a cell phone while driving? __Never (0 times) __(<1 a Month) __(Once a week) __2-3 times a week __1 a day __More than once a day

15. In a rural area, how often do you use a cell phone while driving? __Never (0 times) __(<1 a Month) __(Once a week) __2-3 times a week __1 a day __More than once a day

16. When driving in a city, how often do you use text messaging while driving? __Never (0 times) __(<1 a Month) __(Once a week) __2-3 times a week __1 a day __More than once a day

17. In a rural area, how often do you use text messaging while driving? __Never (0 times) __(<1 a Month) __(Once a week) __2-3 times a week __1 a day __More than once a day

Physical Activity Related Questions

18. What is the most you weighed in your life, excluding pregnancy? _____ lbs.

19. What was your weight when you were 20 years old? _____ lbs.

20. How much would you like to weigh? _____ lbs.

21. Do you walk on a regular basis **at least twice a month** outside of work? ____Yes ____No

a. If yes,

Type of Exercise	Number of months per year	Average number of times per week	Average number of minutes each time
Walking	Months	Per week	Minutes

22. Do you do any other activities, exercise, or hobbies (for example, basketball, bicycling, swimming, or landscaping) at least twice a month? ____Yes ____No

If no, skip sequence...

a. Which of the following types of activities do you do?

Type of activities or hobbies	Yes	No	Number of months per year	Average number of times per week	Average number of minutes each time
Aerobics, Jazzercise			Months	Per week	Minutes
Running, Jogging			Months	Per week	Minutes
Bowling			Months	Per week	Minutes
Bicycling			Months	Per week	Minutes
Swimming			Months	Per week	Minutes
Weight Lifting			Months	Per week	Minutes
Baseball			Months	Per week	Minutes
Basketball			Months	Per week	Minutes
Football			Months	Per week	Minutes
Soccer			Months	Per week	Minutes
Racquetball			Months	Per week	Minutes

Handball			Months	Per week	Minutes
Tennis			Months	Per week	Minutes
Snow Skiing or Snowboarding			Months	Per week	Minutes
Water Skiing or Wave Runner			Months	Per week	Minutes
Hunting			Months	Per week	Minutes
Fishing			Months	Per week	Minutes
Martial Arts (Karate, Judo, etc.)			Months	Per week	Minutes
Yoga			Months	Per week	Minutes
Relaxation therapy			Months	Per Week	Minutes
Gardening, Landscaping			Months	Per week	Minutes
Maintenance (e.g. car or engine repair), Mechanical Work			Months	Per week	Minutes
Driving an ATV / 4 wheeler / off-road vehicle			Months	Per week	Minutes
Snowmobiling			Months	Per week	Minutes
Housework (mopping, cleaning, dusting, etc)			Months	Per week	Minutes
Other (please specify)			Months	Per week	Minutes
Other (please specify)			Months	Per week	Minutes
Other (please specify)			Months	Per week	Minutes

23. Which of the following activities do you regularly do while on breaks from driving?
    _____ Walk
    _____ Eat
    _____ Watch TV
    _____ Rest
    _____ Other _____ (list activity) _____

24. When you are not "on the road," altogether, approximately how much time in a usual day do you spend sitting down (e.g. watching TV, reading, using a computer, and/or going to the movies, etc…)? _____ hours per day

25. In general, would you say your current health is:
    _____ Excellent
    _____ Good
    _____ Fair
    _____ Poor

26. Have you ever been told by a physician or other health care provider that you have any of the following:

    a. Diabetes or elevated blood sugar controlled by diet, pills and/or insulin? ___ Yes ___ No
       Approximately how many years ago was this diagnosed? _____ Years
       With which of the following are you treating the Diabetes or elevated blood sugar?
       ____ Insulin
       ____ Pills / Oral Agents
       ____ Both Insulin and Pills
       ____ Diet only (no insulin or pills)
       (For women) Did you only have diabetes when pregnant and then it resolved? ___ Yes ___ No

    b. Chronic Fatigue Syndrome? ___ Yes ___ No

    c. Irritable Bowel Syndrome? ___ Yes ___ No

    d. Rheumatoid arthritis, Lupus, or another inflammatory arthritis (not typical Osteoarthritis or Degenerative Arthritis)? ___ Yes ___ No
       Approximately how many years ago was this diagnosed? _____Years

    e. Osteoarthritis or Degenerative Arthritis? ___ Yes ___ No

    f. Thyroid problem? ___ Yes ___ No
       Approximately how many years ago was this diagnosed? _____Years

    g. Gout? ___ Yes ___ No
       Approximately how many years ago was this diagnosed? _____Years

    h. Kidney Failure? ___ Yes ___ No
       Approximately how many years ago was this diagnosed? _____Years

    i. High Blood Pressure? ___ Yes ___ No
       Approximately how many years ago was this diagnosed? _____Years
          i. How many medications are you taking for high blood pressure?
          ___ None
          ___ One
          ___ Two
          ___ Three or more

j. High cholesterol (Laboratory test result over 200 mg/dL) ___ Yes ___ No
Approximately how many years ago was this diagnosed? _____Years

      i. How many medications are you taking for high cholesterol?
        ___ None
        ___ One
        ___ Two
        ___ Three or more

k. Hernia (Abdominal or Inguinal hernia. Does not include disk hernia): ___ Yes ___ No
_____(please specify)

l. Head/Brain injuries, disorders, or illness? ___ Yes ___ No
If so please specify: _____(please specify)
    Approximately how many years ago was this diagnosed? _____Years

m. Seizures, epilepsy? ___ Yes ___ No
If so please specify: _____(please specify)
    Approximately how many years ago was this diagnosed? _____Years

      i. How many medications are you taking for seizures?
        ___ None
        ___ One
        ___ Two
        ___ Three or more

n. Eye disorders or impaired vision (except corrective lenses)? ___ Yes ___ No
If so please specify: _____(please specify)
    Approximately how many years ago was this diagnosed? _____Years

o. Ear disorders, loss of hearing or balance? ___ Yes ___ No
If so please specify: _____(please specify)
    Approximately how many years ago was this diagnosed? _____Years

p. Heart disease or heart attack; other cardiovascular condition? ___ Yes ___ No
If so please specify: _____(please specify)
    Approximately how many years ago was this diagnosed? _____Years

q. Heart surgery (valve, replacement/bypass, angioplasty, pacemaker)? ___ Yes ___ No
   If so please specify: _____(please specify)
      Approximately how many years ago was this diagnosed?   _____Years

r. Muscular disease? ___ Yes ___ No
   If so please specify: _____(please specify)
      Approximately how many years ago was this diagnosed?   _____Years

s. Shortness of breath? ___ Yes ___ No
   If so please specify: _____(please specify)
      Approximately how many years ago was this diagnosed?   _____Years

t. Lung disease, emphysema, asthma, chronic bronchitis? ___ Yes ___ No
   If so please specify: _____(please specify)
      Approximately how many years ago was this diagnosed?   _____Years

u. Kidney disease, dialysis? ___ Yes ___ No
   If so please specify: _____(please specify)
      Approximately how many years ago was this diagnosed?   _____Years

v. Liver disease? ___ Yes ___ No
   If so please specify: _____(please specify)
      Approximately how many years ago was this diagnosed?   _____Years

w. Digestive problems? ___ Yes ___ No
   If so please specify: _____(please specify)
      Approximately how many years ago was this diagnosed?   _____Years

x. Nervous or psychiatric disorders, e.g., severe depression? ___ Yes ___ No
   If so please specify: _____(please specify)
      Approximately how many years ago was this diagnosed?   _____Years

y. Loss of, or altered consciousness? ___ Yes ___ No
   If so please specify: _____(please specify)
      Approximately how many years ago was this diagnosed?   _____Years

z. Fainting, dizziness? ___ Yes ___ No
   If so please specify: _____(please specify)
      Approximately how many years ago was this diagnosed?   _____Years

aa. Sleep disorders, pauses in breathing while asleep, daytime sleepiness, loud snoring? ___ Yes ___ No
   If so please specify: _____(please specify)
      Approximately how many years ago was this diagnosed?   _____Years

bb. Stroke or paralysis? ___ Yes ___ No
   If so please specify: _____(please specify)
      Approximately how many years ago was this diagnosed?   _____Years

cc. Missing or impaired hand, arm, foot, leg, finger, toe? ___ Yes ___ No
    If so please specify: _____(please specify)
        Approximately how many years ago was this diagnosed? _____Years

dd. Spinal injury or disease? ___ Yes ___ No
    If so please specify: _____(please specify)
        Approximately how many years ago was this diagnosed? _____Years

ee. Chronic low back pain? ___ Yes ___ No
    If so please specify: _____(please specify)
        Approximately how many years ago was this diagnosed? _____Years

ff. Narcotic or habit forming drug use? ___ Yes ___ No ___ I choose not to answer this question
    If so please specify: _____(please specify)
        Approximately how many years ago was this diagnosed? _____Years

Please note that the use of narcotics or habit forming drugs while operating vehicles may be dangerous. Reminder: the researchers of this study will NOT disclose any information regarding drug use to your employer or to law enforcement.

gg. Do you have any other diseases? ___ Yes ___ No
    If so please specify: _____(please specify)
        Approximately how many years ago was this diagnosed? _____Years

hh. Do you have any other diseases? ___ Yes ___ No
    If so please specify: _____(please specify)
        Approximately how many years ago was this diagnosed? _____Years

ii. Do you have any other diseases? ___ Yes ___ No
    If so please specify: _____(please specify)
        Approximately how many years ago was this diagnosed? _____Years

jj. Do you have any other diseases? ___ Yes ___ No
    If so please specify: _____(please specify)
        Approximately how many years ago was this diagnosed? _____Years

27.   What prescription medications do you take at least once a month?

_____ _____ _____ _____
_____ _____ _____ _____
_____ _____ _____ _____

28. What over the counter medications, herbal treatments, or vitamins do you take at least once a month?

_____ _____ _____ _____
_____ _____ _____ _____
_____ _____ _____ _____

63

29. Have you ever seen a psychologist? ___ Yes ___ No

30. Have you ever seen a psychiatrist? ___ Yes ___ No

31. Have you ever been diagnosed with a personality disorder? ___ Yes ___ No

32. Do you wear eye glasses or contacts? Yes___   No___
    If yes, do you ever wear them to read? Yes___   No___
    If yes, do you ever wear them to drive? Yes___   No___
    If yes, are you required to wear them to drive? Yes___   No___

33. Do you wear a hearing aid? Yes___ No___
    If yes, which side? Right___ Left___ Both___

34. How often do you have back pain and/or back stiffness when getting out of bed in the morning?
    _____Never
    _____Sometimes
    _____Often
    _____Always

35. Do you snore at night?   _____ Yes _____ No

36. Has anyone ever told you that you stop breathing when you sleep? _____ Yes _____ No

37. Do you usually awake in the morning fully rested? _____ Yes _____ No

38. Have you ever had a heart rhythm problem? _____ Yes _____ No
    If yes, approximately when? _____(year)

39. Have you ever had a heart attack?   _____ Yes _____ No
    If yes, approximately when? _____(year)

40. Do you have health insurance? ___ Yes ___ No *If No, skip to 42.*

41. Please briefly discribe your health insurance coverage. _____
_____
_____

42. On <u>average</u>, how many times do you climb <u>into</u> your truck every day?

   _____ times a day I climb into my truck.

43. Have you ever slipped and caught yourself **Before Falling** when
   mounting a truck?   ___ Yes ___ No
   dismounting a truck?   ___ Yes ___ No
   <If Yes, 2., else skip to 3.>

44. In your lifetime, how many times have you ever slipped and **Fallen** when
   _____dismounting a truck?
   _____mounting a truck?
   <If >0 >

45. How many times in the past 12 months have you slipped or tripped and **Fallen**
   mounting a truck _____ # of times.
   dismounting a truck _____ # of times.
   <If > 0 then follow with questions a) – e)>

   On your most recent fall, what were some of the factors that you think helped cause the fall (Select all that apply)
   a) Location on truck.
       Cab, Trailer, Other_____
   b) Time of day: Morning, Afternoon, Evening, Night
   c) Season: Spring, Summer, Fall, Winter
   d) Were any environmental factors involved?
           Rain, Snow, Ice, Mud, Other e)_____
   What kind of footwear were you wearing?
   Work Boots, Athletic Shoes, Cowboy Boots, Other_____
   f) Any other factors not listed above _____
   <Skip to question 7. if answer to questions 1. and 3. = O>

46. How many times in the past 12 months have you slipped or tripped **Without Falling**
   mounting a truck _____ # of times.
   dismounting a truck _____ # of times.

47. Have you ever lost a day or more of work from a slip/fall mounting or dismounting a truck?
   ___ Yes ___ No   _____Number of days

48. Have you ever seen a health care professional because of an injury related to mounting or dismounting a truck? ___ Yes ___ No

49. How many hand holds and steps do you use when getting in and out of your truck?
     _____ Hand holds
     _____ Steps

50. What is the make, model and year of the truck that you normally drive?

51. For women only:

     a. Are you currently pregnant? ____ Yes ____ No

         i. If yes, when is your due date _____/_____/_____
                                              Month   Day   Year

     b. How many times have you been pregnant? _____

     c. How many children have you given birth to? _____

     d. Have you ever used estrogen, progesterone, or other female hormones by pill, injection, or
     patch? Please choose from one of the following answers:
         ___ yes, currently
         ___ yes, but not now
         ___ no
         ___ don't know
         ___ refuse

         i. What is the total number of years that you have used estrogen, progesterone, or other
             female hormones by pill, injection, or patch?
             ___ Years
             ___ Less than one Year
             ___ Don't Know
             ___ Refuse

         ii. (If "Don't Know") Altogether, about how long do you think you took estrogen,
             progesterone, or other female hormones by pill, injection, or patch? Select the category
             from the list that comes closest to your best guess:
             ___ Less than one
             ___ 1-3 years
             ___ 4-5 years
             ___ 6-10 years
             ___ 11-15 years
             ___ 16 or more years
             ___ Don't Know
             ___ Refuse

                         Subgroup—Family and Family Health Questions

52. How many cups of caffeinated coffee do you drink in an average day?
     _____ Number of cups per day _____ I don't drink coffee

53. How many 12 oz. glasses (one can) of caffeinated soda pop (e.g. Coke, Pepsi) do you drink in an average day?

_____ Number of glasses per day _____ I don't drink caffeinated soda pop

54. How many cans of any other kind of high energy/caffeinated beverages (Red Bull, Rockstar, Etc.) do you drink in an average day?

_____ Number of can(s) per day _____ I don't drink high energy beverages

55. How many caffeine pills or over the counter stimulants (Stay Awake, Vivarin, Xlean, Ephedrine, Nagnum) do you take on an average day?

_____ Number of pills per day _____ I don't take caffeinated pills or stimulants

56. Do you use caffeinated beverages or any other products to help you stay awake while you drive?
_____ Yes _____ No

57. Do you do anything to help you stay awake while you drive (Roll down the window Etc.)?
_____ Yes _____ No
    a. If yes, _____ Pull down window
                _____ Play music
                _____ Talk on the phone or radio
                _____ Other _____

58. Over the past year, how much alcohol do you drink in an average week?
(1 drink = 12 oz. beer, 6 oz. wine, or 1 oz. liquor)
_____ None
_____ 1-2 drinks per week
_____ 3-5 drinks per week
_____ 6-11 drinks per week
_____ 12-17 drinks per week
_____ 18-23 drinks per week
_____ 24-29 drinks per week
_____ 30 or more drinks per week

59. In the past, have you ever had a problem with alcohol? _____ Yes _____ No
    a. If yes, approximately how many years ago? _____ Years

60. Have you ever smoked a total of 100 cigarettes or more over your lifetime?
_____ Yes _____ No

    a. Did you ever smoke cigarettes regularly, that is, at least one per day or 6 months or longer? _____ Yes _____ No

    b. How old were you when you first started smoking? _____ Years

    c. How old were you when you last smoked cigarettes?
        _____ Years _____ I still smoke.

61. Thinking about the years between the age of <<38 b>> and << 38 c/the present>> was there ever a period of one year or longer which you did **not** smoke cigarettes? ___ Yes ___ No

   a. For how many years between <<38 b>> and << 38 c/the present>> did you stop smoking? _____Years

   b. Thinking about all of the years you smoked, how many cigarettes did you usually smoke in a day? ____ per day

62. Have you ever smoked at least one cigar per week for six months or longer?
   ___ Yes ___ No

   a. For how many years altogether (did/have) you (smoke/smoked) cigars? Please do not include any periods during which you may have quit. _____Years

   b. How old were you when you first started smoking at least one cigar per week? ____ Years

   c. How old were you when you last smoked cigars?
     _____ Years ____I still smoke.

63. Thinking about all the years you smoked cigars, how many cigars did you usually smoke in a week? _____ cigars

64. Has anyone in your family (blood relatives only) ever been diagnosed with:

  a. Coronary Artery Disease or had a heart attack?   ___ Yes ___ No
        Approximately how many years ago was this diagnosed?   _____Years

  b. Diabetes?   ___ Yes ___ No
        Approximately how many years ago was this diagnosed?   _____Years

<div align="center">Job Related Questions</div>

Now please think of your work experiences over the past 4 weeks (28 days). In the spaces provided below, write the number of days you spent in each of the following work situations.

65. In the past 4 weeks (28 days) have you called in sick because of personal illness? ___Yes ___No If so, how many days? ____Days

66. In the past 4 weeks (28 days) have you called in sick for other reasons (child illness, Etc.)? ___Yes ___No If so, how many days? ____Days

67. How many people do you personally supervise on your job?
   _____ Number of people

68. In the past **12 months**, did you have a work related accident, injury, or poisoning that required medical attention?
   ___ Yes   ___ No

If yes, how many days of work did you miss in the past **12 months** because of a work related accident, injury, or poisoning? (If less than 1 day, enter 0.)

_____ Number of days (0-365)

69. My job requires working very hard (physically).

_____ Never

_____ Seldom

_____ Often

_____ Always

70. How often are you physically exhausted after work?

_____ Never

_____ Seldom

_____ Often

_____ Always

71. How often are you mentally exhausted after work?

_____ Never

_____ Seldom

_____ Often

_____ Always

72. Do you get along with your co-workers and other people you work with?

____ Always

____ Often

____ Seldom

____ Never

73. All in all, how satisfied are you with your job?

____ Very satisfied

____ Satisfied

____ Neither satisfied nor dissatisfied

____ Dissatisfied

____ Very dissatisfied

74. My employer cares about my health and safety on the job.

____ Strongly agree

____ Agree

____ Neither agree nor disagree

____ Disagree

____ Strongly Disagree

75. On a scale from 0 to 10 where 0 is the worst job performance anyone could have at your job and 10 is the performance of a top worker, how would you rate your usual job performance over the past year or two?

Worst Performance										Top Performance
0	1	2	3	4	5	6	7	8	9	10

76. Using the same 0-to-10 scale, how would you rate your overall job performance on the days you worked during the past 4 weeks (28 days)?

Worst Performance										Top Performance
0	1	2	3	4	5	6	7	8	9	10

Modified Work APGAR

Please place a checkmark in the box corresponding with how you feel about each of the following statements.

		Almost always	Some of the time	Hardly ever
77.	I am satisfied that I can turn to a fellow worker for help if something is troubling me.			
78.	I am satisfied with the way my fellow workers talk things over with me and share problems with me.			
79.	I am satisfied that my fellow workers accept and support my new ideas and thoughts.			
		Almost always	Some of the time	Hardly ever
80.	I am satisfied with the way my fellow workers respond to my emotions, such as anger, sorrow, or laughter.			
81.	I am satisfied with the way my fellow workers and I share time together.			
82.	I enjoy the tasks involved in my job.			
83.	I am satisfied with how well I get along with my closest or immediate supervisor.			

NOTE: The following are additional questions that will need to be added to this questionnaire. Formatting will need to be adjusted as necessary, and some questions will require skip sequences.

The following questions refer only to your activities as a professional driver:

84. Have you ever had any reportable motor vehicle accidents as a professional driver?   _____yes _____no

      If no, skip sequence.

        a. How many reportable motor vehicle accidents as a professional driver have you had?

          _____ 1

          _____ 2

          _____ 3

          _____ 4

          _____ 5

          _____ 6 or more

        b. Why did they occur (check all that apply)?

	Pressure to	Bad Weather	Health problems	Speeding	Car driver error	I fell asleep	Other (fill in)

	deliver on time						
1st accident							
2nd accident							
3rd accident							
4th accident							
5th accident							
6th accident							

For this question, "near miss truck accident" means you had to take some evasive action to avoid a crash (brake hard, swerve steering, etc.)

85. In the past <u>month</u>, about how many near miss truck accidents did you experience? _____

86. Do you perform loading/unloading (lumping) activities as part of your routine driving duties (not including the use of a powered forklift)?
_____Yes _____No   If no skip sequence.

      a. How often do you regularly perform loading/loading activities?
          _____ 1 time per week or less
          _____ 1 time every 2-4 days
          _____ 1 time per day
          _____ 2-4 times per day
          _____ >5 times per day

      b. What is the maximum weight that you typically lift in loading/unloading activities?
          _____ 10 lbs.
          _____ 20 lbs.
          _____ 50 lbs.
          _____ 100 lbs.
          _____ >100 lbs.

87. Do you put on and take off chains as needed in snow and ice? _____Yes _____No

88. Have you had Low Back Pain lasting more than one day in your lifetime? _____Yes_____No
    If no, skip sequence.

    a. About how many times have you had Low Back Pain that lasted longer than 1 day in your lifetime?

    _____1 _____6 _____>10
      _____2 _____7

3	8
4	9
5	10

b. Have you had any Low Back Pain lasting more than one day in the past year? _____Yes _____No
If no, skip sequence.
   i. What was the cause of this episode of Low Back Pain? (If more than once in the last year, what was the cause of the first time).
      _____Unsure
      _____ Something at work
      _____ Something outside of work
      _____ Relapse of low back pain returning from previous pain from work
      _____ Relapse of low back pain returning from previous pain from outside of work

   ii. If "something at work"
      _____ Accident
      _____ Single Lift
      _____ Multiple Lifts
      _____ Pushing
      _____ Pulling
      _____ Other _____

   iii. If "something outside of work"
      _____ Accident
      _____ Lift
      _____ Multiple Lifts
      _____ Pushing
      _____ Pulling
      _____ Other _____

iv. If "Relapse of Low Back Pain returning from previous pain from work"

_____ Accident
_____ Lift
_____ Multiple Lifts
_____ Pushing
_____ Pulling
_____ Other _____

v. If "Relapse of Low Back Pain returning from previous pain from outside of work"

_____ Accident
_____ Lift
_____ Multiple Lifts
_____ Pushing
_____ Pulling
_____ Other _____

vi. Did you use any medications for this Low Back Pain? _____ yes _____ no   If no, skip sequence.

a) Did you use any of the following over-the-counter medications (mark all that apply)?
_____ aspirin
_____ ibuprofen (advil, motrin, nuprin)
_____ acetaminophen (tylenol)
_____ other _____

b) Did you use any of the following prescription medications (mark all that apply)?
_____ anti-inflammatories (ibuprofen, naproxen, voltaren, relafen, etc...)
_____ muscle relaxers, narcotics (lortab, vicodin, percocet, etc...)
_____ sleep medications (ambien, halcion, sonata, etc...)

c. What types of treatments did you use for this episode of Low Back Pain?
       1. Back Surgery   (Yes No)
       2. Injection in the back   (Yes No)
       3. Back Brace   (Yes No)

4. Seeing a:
    a. Chiropractor   (Yes No)
    b. Physician   (Yes No)
    c. Physical or Occupational Therapist   (Yes No)
    d. Other   _____
5. Light Duty   (Yes No)
6. Other Treatment (Please Specify)   _____
7. Aerobic Exercise   (Yes No)
8. Strength Exercise   (Yes No)
9. Stretching Exercise
        (Yes No)

89. Approximately what is the single longest continuous period of time you have had **<u>Low Back Pain in the past three (3) months</u>**?
    __None/less than 24 hours __ 1 Day __ 2 Days __ 3 Days __4 Days __ 5 Days
    __ 6 Days __ 7 Days __ Other (specify)_____ Days

    a. What is the average pain rating of this low back pain? ___ out of 10 with 10 being the worst.

90. In the past month have you used something to help you sleep? ___ Yes ___ No
    a. If yes, mark all that apply
        ____ OTC Medication
        ____ Alcohol
        ____ Prescription
        ____ Other (please specify) _____

Psychosocial Questions

91. How often do you have back pain and/or back stiffness within an hour of when you start driving?

_____Never

_____Sometimes

_____Often

_____Always

92. How often do you have family problems that irritate or bother you?

____ Never

____ Occasionally

____ Often

____ Always

       a. (*IF ANSWER OCCASIONALLY, OFTEN, or ALWAYS*) Is (are) the family problem(s) most often caused by (please rank any that apply):

         ___ Financial stress

         ___ Belief Disagreements

         ___ Children or Step Children

         ___ Parents or In-laws

         ___ Siblings

         ___ Disease/illness

         ___ Time away from the family

         ___ Household responsibilities

         ___ Other (specify) _____

93. How strongly do you agree with the statement "I can talk with my partner, or a close friend, about the sadness I feel."

___ Strongly Agree

___ Agree

___ Disagree

___ Strongly Disagree

94. How strongly do you agree with the statement "I have at least one person I can confide in."

___ Strongly Agree

___ Agree

___ Disagree

___ Strongly Disagree

95. How well do you sleep at night?

____ Very Well

____ Well

____ Fair

____ Poorly

____ Very Poorly

96. When on the road, on average, about how many total hours of sleep do you get per 24 hour period? (Don't count time you are laying awake or trying to fall asleep.)

_____ Does not apply. I always sleep at home. (go to question 76)

<2	4	6	8
2 ½	4 ½	6 ½	8 ½
3	5	7	9
3 ½	5 ½	7 ½	>9

97. When at home, on average, about how many total hours of sleep do you get per 24 hour period? (Don't count time you are laying awake or trying to fall asleep.)

<2	4	6	8
2 ½	4 ½	6 ½	8 ½
3	5	7	9
3 ½	5 ½	7 ½	>9

98. How often during the past month has your sleep been restless?
_____ Never
_____ Sometimes
_____ Often
_____ Always

99. Do you ever use any of the following to help you sleep at night?
_____ Over-the-counter sleep medications (unisom, Tylenol PM, Sominex, etc…)
_____ Prescription sleep medications (ambien, halcyon, sonata, etc…)
_____ Alcohol
_____ Other _____

100. How often during the past year have you felt "down", blue or depressed?
_____ Never
_____ Seldom
_____ Often
_____ Always

101. How often during the past month have you felt uneasy?
_____ Never
_____ Sometimes
_____ Often
_____ Always

102.	How often during the past month have you felt "on the edge"?
____ Never
____ Sometimes
____ Often
____ Always

103.	How often during the past month have you felt tense?
____ Never
____ Sometimes
____ Often
____ Always

Fat Screener

104.	Think about your eating habits over the past 12 months. About how often did you eat or drink each of the following foods? Remember breakfast, lunch, dinner, snacks, and eating out. Blacken in only one bubble for each food.

TYPE OF FOOD	Never	Less than Once Per Month	1-3 Times Per Month	1-2 Times Per Week	3-4 Times Per Week	5-6 Times Per Week	1 Time Per Day	2 or More Times Per Day
Cold cereal								
Skim milk, on cereal or to drink								
Eggs, fried or scrambled in margarine, butter, or oil								
Sausage or bacon, regular-fat								

TYPE OF FOOD	Never	Less than Once Per Month	1-3 Times Per Month	1-2 Times Per Week	3-4 Times Per Week	5-6 Times Per Week	1 Time Per Day	2 or More Times Per Day
Margarine or butter on bread, rolls, pancakes								
Orange juice or grapefruit juice								
Fruit (not juices)								
Beef or pork hot dogs, regular-fat								
Cheese or cheese spread, regular-fat								
French fries, home fries, or hash brown potatoes								
Margarine or butter on vegetables, including potatoes								
Mayonnaise, regular-fat								
Salad dressings, regular-fat								
Rice								
Margarine, butter, or oil on rice or pasta								

105. Over the past 12 months, when you prepared foods with margarine or ate margarine, how often did you use a reduced-fat margarine?

___ DIDN'T USE MARGARINE
___ Almost never
___ About ¼ of the time
___ About ½ of the time
___ About ¾ of the time
___ Almost always or always

106. Overall, when you think about the foods you ate over the past 12 months, would you say your diet was high, medium, or low in fat?
___ High
___ Medium
___ Low

Modified Zung Depression Index

Please indicate for each of the following questions which answer best describes how you have been feeling.	Rarely or none of the time (less than 1 day per week)	Some or little of the time (1–2 days per week)	A moderate amount of time (3–4 times per week)	Most of the time (5–7 days per week)
107. I feel downhearted and sad				
108. I feel that nobody cares				
109. I get tired for no reason				
110. I feel that I am useful and needed				
111. I am still able to enjoy those things I used to enjoy				
112. I eat as much as I used to eat				
113. I am more irritable than usual				
114. I feel hopeful about the future				
115. I feel nervous or anxious				

116. <u>The following personal information (question 114a – 114g) is optional, but all answers are required to receive your compensation</u>. In order to receive your compensation ($10 gift card) please provide us with:

    a.   Your   last   name:
    b.   Your   first   name:
    c.   Your middle name: _____
    d.   Your address: _____
                     _____
                     _____

    e.   Your Commercial Driver's License Number: _____
    f.   State that issued your Commercial Driver's License:_____
    g.   Your Telephone Number: (_____) ____-_____

115. If we have a question about an answer you have provided, may we please contact you for a short phone call?
   ___ Yes   ___ No

    a. If yes, best phone number to contact you: (_____) _____-_____

    Best time to contact you: ___ 8 AM to Noon
                           ___ Noon to 4 PM
                           ___ 4 PM to 9 PM

<u>Thank you</u>
<u>for taking the time to fill out this questionnaire.</u>

Your Blood Results on (date)_____

LDL _____
HDL _____
Total Cholesterol _____
Triglycerides _____
Hemoglobin A1c _____

Your blood pressure was measured at _____ / _____ mmHg
                                                                    systolic   diastolic

Your Height_____cm   andWeight_____kg

For your information, the current classification and recommendation for adult blood pressure measurements are as follows:

Category	Systolic*		Diastolic*		Lifestyle modification?
Normal	<120	and	<80	mmHg	Encouraged
Pre-hypertension	120-139	or	80-89	mmHg	Yes
Stage 1 hypertension	140-159	or	90-99	mmHg	Yes
Stage 2 hypertension	>160	or	>100	mmHg	Yes

Note: This information does not apply to persons taking antihypertensive drugs or those who are acutely ill.
*When systolic and diastolic pressures fall in different categories, the higher category should be used.

LDL (low density lipoprotein), otherwise known as "bad" cholesterol, contributes to plaque buildup in the blood vessel walls. High LDL levels are risk factors for coronary heart disease.

	Optimal level	Near Optimal	Moderate Risk	High Risk	Very High Risk
LDL cholesterol	<100 mg/dL	100-129 mg/dL	130-159 mg/dL	160-189 mg/dL	>190 mg/dL

http://www.informationtherapy.org/kbase/frame/aa769/aa76936/frame.htm

HDL (high density lipoprotein), otherwise known as "good" cholesterol, assists in the removal of cholesterol from the body. Low HDL levels are risk factors for coronary heart disease and high HDL levels protect from heart disease.

	Optimal level	High Risk
HDL cholesterol	>60 mg/dL	<40 mg/dL

Total cholesterol is the combination of HDL and LDL amounts in the blood stream. A high total cholesterol level is a risk factor for coronary heart disease. Fasting before being tested will generally, but only modestly, reduce levels of cholesterol.

	Optimal level	Moderate Risk	High Risk
Total cholesterol	<200 mg/dL	200-239 mg/dL	>240 mg/dL

Triglycerides are the chemical form of fat in the blood. High triglyceride levels are also possible weak risk factors for coronary heart disease.

	High Risk	Very High Risk
Triglycerides	150-199 mg/dL	>200 mg/dL

Hemoglobin A1c (HbA1c) is formed when glucose (sugar) in the blood binds to hemoglobin. The HbA1c test gives an average measure of blood sugar level over the past three months. An elevated level suggests the person has diabetes.

	Non-Diabetic Range	Target Level for Diabetics or Increased Risk for Non-Diabetics	High Risk for Diabetes
Hemoglobin A1c	4-6%	7%	8-12%

Information provided by: The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Journal of the American Medical Association, 2003; 289.

| Subject ID _____ |
| Date _____ |
| Examiner _____ |

WHEEL Health Status Measurement Form

PHYSICAL EXAMINATION	Height _____cm		Weight _____kg
Vital Signs			
Blood Pressure	Systolic mmHg		Diastolic mmHg
Pulse Rate: Beats/min	Comments:		
Blood Tests			
Total Cholesterol	HDL	LDL	Triglycerides
	HbA1c	Glucose	Highly Selective C-Reactive Protein

Circumferences
Neck: _____.__ cm
Chest: _____.__ cm
Waist: _____.__ cm
Hip: _____.__ cm