HEALTH PROMOTION IN THE LONG-HAUL TRUCKING INDUSTRY

by

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DEDICATION

I dedicate this project to my great-grandmother, Rundi Stockman, a fine nurse-midwife and a brave soul. I also dedicate this project to Amy, Twila, and Dan Old Elk, for sharing their strength and wisdom with me. Aho!

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ABSTRACT

The purposes of this project were to: 1) provide background information needed for nurses to enhance health care of the long-haul truck driver, and 2) produce a health promotion pamphlet suitable for distribution to individual long-haul truckers. There are many sources of occupational health interference impacting the health of long-haul truck drivers. These include: 1) isolation with consequently impaired family relations; 2) limited dietary choices; 3) the usual dangers of travel; 4) poor access to health care providers; 5) sleep disturbances and fatigue; 6) chronic exposure to vibration, noise, and hazardous substances; and, 7) lack of exercise. Nursing interventions to address each of these areas of health interference for the long-haul truck driver were derived from an extensive literature review. Based on these interventions, a health promotion pamphlet suitable for distribution to individual long-haul truckers was developed. The goal of the nurse caring for the long-haul truck driver was identified as promoting adaptation of the trucker to his or her environment. Various plans of disseminating the information gathered in this project were proposed.

CHAPTER ONE

INTRODUCTION TO PROJECT

Purpose

The purposes of this project were to: 1) provide background information needed for nurses to enhance health care of the long-haul truck driver, and 2) produce a health promotion pamphlet suitable for distribution to individual long-haul truckers. Long-haul truck drivers are demonstrably at high risk for developing many chronic health problems by the mere nature of their work. The nursing profession has embraced primary prevention and holistic care as primary goals of practice. Implementing these goals can be actualized by gaining knowledge of a person's routine daily activities so to identify health risk factors. Increased awareness of the long-haul truck driver's risk factors will enhance health care provided to this population. Additionally, the health of long-haul truck drivers could be improved by population-based primary prevention.

Background and Significance of Project

It is somewhat expected and accepted that occupations may negatively affect one's health. We have all experienced the effects of our occupations manifested in a physical or psychologically negative way at some time in our work life. An achy back, feelings of fatigue, the sense that we haven't had enough sleep, and an endless sense of giving of one's body and mind to the job may be influenced by one's occupation. Unfortunately,

long-haul truck drivers frequently endure more than short-term effects from their occupation. The trucker no longer just contributes to productivity, he or she may slowly contribute to self-destruction.

Brady et al (1997) note the gravity of the direct health care costs of unhealthy workers in the United States as over 418 billion dollars, and indirect costs as over 837 billion dollars. Major impacts on corporate productivity and competitiveness, as well as on availability of health care programs for employees, could result from decreasing these high costs (Brady et al, 1997). More tragic than the financial costs are the human costs. Lax, Grant, Manetti, and Klein note that "an estimated 860,000 illnesses and 60,300 deaths from workplace exposures occur annually in the United States" (1998, p. 937).

Long-haul truck drivers are at risk for many chronic health conditions by both the nature of their work and by participation in habit-forming activities including smoking and heavy caffeine intake. A concept analysis of "occupational health interference" was identified by the author in a nursing theory course at Montana State University. Occupational health interference was defined as the hindrance or obstruction of the health of an individual relating to, or caused by, engagement in a particular occupation (Wallis, 1997). Some of the many sources of occupational health interference for individuals in the trucking industry include: 1) isolation with consequently impaired family relations; 2) limited dietary choices; 3) the usual dangers of travel; 4) poor access to health care providers; 5) sleep disturbances and fatigue; 6) chronic exposure to vibration, noise, and hazardous substances; and, 7) lack of exercise.

A truck driver is defined by the Bureau of Labor Statistics (1997) as one who drives a "tractor trailer combination or a truck with a capacity of at least 26,000 gross vehicle weight (GVW) to transport and deliver goods, livestock, or materials in liquid, loose, or packaged form" and "requires a commercial driver's license." A long-haul trucker generally leaves home for more than a week at a time with a route that is variable. These drivers often report spending an average of seven or fewer days per month at home. Long-haul truckers may either work for a trucking company, own and operate a privately owned truck, or lease their truck and services to a company. Other truckers may have a local route that lands them home every night, or have a fixed route between two far-off destinations. While most people consider a cross-country road trip an epic event that comes only with a lengthy vacation, long-haul truckers routinely cover distances of over a hundred-thousand miles per year.

The significance of the trucking industry to our nation is remarkable. The United States' economy is greatly dependent on the transportation of goods. As a bumper sticker on one long-haul truck so aptly stated, "If you own it, a trucker brought it to you." The long-haul trucking industry also provides a vital work force for our nation and generates huge revenues. Trucks move 4.4 trillion dollars of goods, or seventy-two percent of the total goods in the United States (Ammah-Tagoe, 1997). Freight trucks numbered 6.9 million in 1995, and drove 0.2 trillion miles (Sedor, 1997).

Nurse practitioners are in an excellent position to tailor their practices to the needs of the large numbers of long-haul truck drivers. As nurse practitioners plan to focus on holistic health provision, they need to be cognizant of the effects of occupational health

interference, and be able to assess for these effects during the client's health history and physical. Much work needs to be done to develop and implement population based primary prevention plans in the work place of long-haul truckers. Individualized plans of primary prevention in the clinical setting should be offered as well.

Conceptual Framework

The conceptual framework for this project was derived from key elements of Systems Theory, Roy's Adaptation Model of Nursing, and Transcultural Nursing Theory. Systems theory, a collective term that fosters many specific theories, was chosen to provide a holistic perspective of the trucking industry. The trucking industry was seen as a large system with many interconnected parts interacting to allow transportation of goods across the land. Trucker culture, family, truck stops, the Department of Transportation, the road, the truck, the trucker, and health care providers are all examples of these parts. Central to this system is the trucker. Using systems theory, the whole trucking system was viewed as greater than the sum of its individual parts.

As the trucker exists within a dynamic environment where continuous adaptation is necessary, Roy's Adaptation Model was chosen as part of the conceptual framework. A person's responses to an environment may either promote the integrity of the person, or lead to disruption of the integrity of the person (Philips et al, 1998). Roy's Adaptation Model focuses on choosing nursing interventions that promote holistic adaptation of the individual to his or her environment so to promote health.

As Roy's Adaptation Model of Nursing was derived, in part, from Systems Theory, there is some overlap between the two. In addition to having wholeness and related parts, the Adaptation Model contends that systems also have inputs, outputs, control, and feedback processes (Philips et al, 1998). Inputs consist of external and internal stimuli affecting the trucker system, such as stress or hazardous exposures for example. In response to these inputs, the trucker must use existing coping strategies. Attempts to cope may impact the trucker physically, mentally, or in his or her role or interdependent functions. The eventual output by the trucker is often dysfunctional, such as depression, cancer, or an accident related to severe fatigue. See Figure 1 for the trucker as an adaptive system.

Figure 1: The Truck Driver as an Adaptive System

Input	Control Processes	Effectors	Output
1. Deadlines, road breakdowns, bad weather 2. Hazardous exposures 3. Unhealthy food choices 4. Poor access to work-out areas 5. Prolonged separation from family/friends 6. Poor access to health care	Coping mechanisms 1. Choose work over sleep 2. Ignore hazardous exposures 3. Eat what is available 4. Little to no physical work-outs 5. Grief or stoic response to loss of family time 6. Engage in habit forming behaviors such as smoking or alcohol abuse 7. Seek health care only as necessary to meet job requirements	Physiological Mode 1. Sleep disorders/fatigue 2. Hypertension, atherosclerosis 3. Weight gain 4. Poor physical conditioning 5. Cell mutations 6. Addictions Self-concept: 1. Poor self-esteem Role-function 1. Decreased job satisfaction 2. Altered parenting and relationship with spouse Interdependence 1. Isolation 2. Loneliness	1. Fatigue and sleep related accidents 2. Cardiovascular disease/peripheral vascular disease 3. Overweight or obesity 4. Stress 5. Higher incidences of cancer 6. Sense of feeling unappreciated by the public 7. Job burn-out 8. Divorce/poor bonding with children/estrange-ment 9. Lack of knowledge to seek health promotion activities.

Following Roy's Model, goals of nursing would be to promote adaptation of the long-haul trucker to the system of the trucking industry. Specific attention is paid to the trucker's self-concept, role-function, and interdependence as well as to his or her physiologic functioning. This would be carried out by designing interventions to promote adaptive responses, or those to promote the trucker's integrity in terms of the goals of adaptation: survival, growth, reproduction, and mastery (Philips et al, 1998).

The third element of the conceptual framework for this project was transcultural nursing theory. Leininger (1997) defines transcultural nursing as "a formal area of study and practice focused on comparative holistic cultural care, health, and illness patterns of people with respect to differences and similarities in their cultural values, beliefs, and life ways" with the goal to "provide culturally congruent, competent, and compassionate care" (p.342). Recognizing the long-haul truck driver's culture allows nurses to approach this population in a more sensitive and astute manner.

Long-haul truckers have a recognizable and unique culture. They primarily inhabit their truck where they sleep and spend a majority of their time. A comradeship on the road develops and communication through community band (CB) radios keeps them connected. It is common for truckers to tag-team each other for sections of their route for companionship. Established areas along truck routes have developed for truckers to fuel-up, shower, eat, and sleep. One can often note over 300 trucks in some of these stops at times with lounge areas full of gambling machines and a television for the truckers to gather around. The truck itself is often seen as a work of art, and truckers take pride in a clean and neatly loaded rig as part of their identity. Many husband and wife

trucker teams exist, and children often follow their parents into a trucking career. Numerous trucker web sites with chat-rooms have also evolved on the Internet with computer terminals located in many truck-stops. Truckers face unique challenges and stressors while on the road, and a unique society has evolved to help them get the loads through.

CHAPTER TWO

LITERATURE REVIEW

Overview of the Trucking Industry

The United States has the largest highway transportation system in the world with four million miles of roads (Sedor, 1997). According to the U. S. Department of Transportation, the trucking industry has grown dramatically with a twenty-four percent increase in the number of trucks from 1982 to 1992 (Sedor, 1997). The United States depends more and more on the flow of commodities and peoples. Unfortunately, the human cost of our nation's dependence on transportation is high as we endure severe highway death tolls, pollution, dependence on foreign oil sources, and environmental catastrophes (Sedor, 1997).

Montana, a large and mostly rural state, may be used as an exemplar for discussing the nature of the trucking industry in rural areas. Industries within Montana include petroleum, minerals, agriculture, and production of hand crafted goods bearing the proud "Made in Montana" logo. Trucks transport 61.7% of the value of shipments originating in Montana (Freight Transportation in Montana, 1996). The U. S. Department of Transportation (1997) reported Montana's shipments at $37,586 million for 1993, with 10,028 million ton miles. The survival of people across the state depends upon the trucking industry to transport goods in and out of their communities.

Many truckers themselves live in highly rural areas. Trucking often provides employment in a setting without many job opportunities. According to 1992 census data for Montana provided by the Department of Transportation, 6,501 paid employees are non-local truckers, and 1,620 are paid employees in local trucking (Freight Transportation in Montana, 1996). In 1995, the number of employees involved in the trucking and warehousing industry in five randomly selected Montana counties revealed the following: 1) Lincoln County, 57 trucking employees of the 3,542 total employees; 2) Beaver Head, 123 trucking employees of the total of 2,056 total employees; 3) Teton County, 21 trucking employees of the total 978 employees ; 4) Gallatin County, 316 trucking employees of the total 22,544 employees; 5) and Fergus County, 139 trucking employees of the total 3,041 employees (on-line services, U. S. Census Bureau).

Many workers in the trucking industry maintain their homes in rural areas. It has been noted that rural workers often value health as the ability to continue work (Weinert & Long, 1991). Wallis and Polich (1997), after a series of interviews with both urban and rural truckers, found the truckers' perception of good health was generally tied to being able to perform work. Independent rural and urban truckers are financially responsible for their own rigs and trucking operations. These independent truckers equate an inability to work with a complete loss of income. Indeed, many truckers are vulnerable to economic collapse if they are unable to pass the Department of Transportation (DOT) physical exams needed to maintain their commercial driver's license (CDL). Given the dire consequences of the loss of a CDL, health care providers should be in a position to offer care tailored to the trucker's unique health needs.

Unfortunately, this care is often not rendered by health care providers. The following section discusses health care that may commonly be provided by health care providers to truck drivers.

Current Paradigm of Care

The commercial driver must successfully complete DOT physical exams in order to be in compliance with the Federal Motor Carrier Safety Regulations (FMCSRs). The DOT physical exam is required bi-annually from a licensed medical provider. The FMCSRs were amended in 1992 to allow advanced nurse practitioners, physician assistants, and chiropractic physicians to perform the DOT physical exam (Pommerenke, Hegmann, & Hartenbaum, 1998).

The Federal Highway Administration (FHWA) dictates in Part 391.43 of the DOT guidelines that medical examiners shall be knowledgeable of the specific physical and mental demands associated with operating a commercial motor vehicle and the requirements of this subpart, including the medical regulatory criteria prepared by the FHWA as guidelines to aid the medical examination in making the qualification determination; as well as be proficient in the use of and use the medical protocols necessary to adequately perform the medical examination required by this section (1998). The DOT physical exam is one of the most frequently performed ambulatory procedures (more than 6 million drivers operate commercial vehicles). Incompetent performance of the exam can result in liability for the provider. Yet the guidelines and training in

performing this examination are rarely offered to the provider in training (Pommerenke, et al, 1998).

Generally, a standardized form provided by the Department of Transportation is completed at the time of the DOT physical exam. Though it was provided by the FMCSR only as an example, it is the most commonly used form (see Appendix A). This form is disease oriented in nature and meant to screen for red flags that may possibly prohibit certification. Pommerenke et al (1998) point out that while performing the DOT physical "physicians and other examiners should remember that their primary responsibility is to the public - not, as in the usual office visit, to the patient" (p. 418). Health screening, such as crude vison or hearing exams, take place only as necessary to preclude the driver from being a hazard on the road. Routine health screening, such as cholesterol levels or testicular exams which are guided by age and risk factors, does not exist in the DOT exam unless the provider takes special initiative.

There are many medical conditions that either restrict or disqualify the driver from continuing in the professional capacity (see Appendix B). There are four conditions that always require denial of CDL certification: insulin treated diabetes mellitus, seizure disorders, significant vision deficits, and significant hearing deficits. Many of the FMCSR conditions precluding certification for drivers are diseases that may be avoided by primary, secondary, and even tertiary prevention measures provided by the primary provider at the time of the DOT physical . For example, a driver may maintain his license if his diabetes is controlled on oral agents and is under medical supervision (Pommerenke et al, 1998). Uncontrolled hypertension is another disease that prohibits

driver certification and might be prevented in many individuals through proper diet, weight control, and exercise.

Pope and Rall (1995) noted that primary care providers are often the first contact health professionals for patients with environmentally related illnesses. Routine screening for risk factors could and should be incorporated into the DOT physical exam by all providers, especially considering the magnitude of health issues that confront the truckers (see Appendix C). A captive audience that must routinely seek health care in order to continue their work should enjoy comprehensive health care.

Nursing has historically addressed the needs of under-served populations, of whom truckers are one. However, nursing has ignored the plight of the trucker's population until Render, in a landmark article, identified cross-country truck-drivers as a "vulnerable population" with unique health needs (1998, p. 164). Render (1998) encourages nurses to open clinics and sponsor health fairs at strategic truck stops or in conjunction with truck shows. Render also contends that nurses could provide case management services to trucking companies for their driver's health needs, as well as influence company policies by studying drivers and their issues. More broadly, Twining, an occupational health nurse practitioner, encourages all nurse practitioners to take a careful occupational and environmental health history. She identified the many purposes of this history to include disease prevention, identification of hazardous exposures, and prevention of the aggravation of an underlying medical condition by occupational or environmental factors (Twining, 1995). An example of an occupational health history format is found in Appendix D.

Fatigue and sleep disturbances are a major source of both controversy and risk in the long-haul trucking industry. Public safety issues are of concern, as well as the individual trucker's safety and general well-being. Federal restrictions regarding hours allowed on the road remain a sore point for many drivers who feel they should self-regulate their own activities. The following section discusses the impact of impaired sleep and chronic fatigue on the long-haul truck driver.

Sleep Disturbances and Chronic Fatigue

Sleepiness is the state of "reduced alertness as a result of increased pressure to fall asleep" where as fatigue may be defined as "the decreased capability of doing physical or mental work, or the subjective state in which one can no longer perform a task effectively" (Lyznicki, Doege, Davis, & Williams, 1998, p. 1909). The National Highway Traffic Safety Administration (NHTSA) estimated the total costs of drowsy driving and fatigue as related to accidents on the road at 12.4 billion dollars per year (Cerrelli, 1997).

Many major studies involving truckers have been conducted in the areas of sleep, fatigue, and alertness to help answer the questions of how much is too much driving and what are the sequella of chronic sleep disturbances. Governmental regulations governing the industry, states that "no driver is permitted to operate a motor vehicle when his or her ability and/or alertness is impaired by fatigue, illness, or any other cause that makes it unsafe to begin or continue to drive the vehicle" (U. S. Department of Transportation, 1998). While these restrictions ideally make sense, truckers are under deadlines and

financial pressures to avoid down-time. Time lost on the road generally comes off of the driver's sleep time (Wallis & Polich, 1997). Essentially, the trucking regulations may provide impractical or impossible criteria for the individual trucker to comply with on every run of the year.

In an attempt to decrease the incidence of fatigue related accidents the Federal government has set restrictions on the hours a truck driver is allowed to work. These rules are aimed at cutting back the long hours of the truckers of old, who wanted to get the load through on time and at any cost. The U. S. Department of Transportation Regulations (1998), Part 395, dictate that a driver may not: 1) drive for more than ten hours in any eighteen-hour period (ten hour rule); and 2) drive after more than sixty hours on duty in seven consecutive days or seventy hours in any eight-day period (sixty and seventy hour rules).

Many truckers probably continue to drive over their allotted hours. Truckers are required to maintain log books [driver's record of duty status] for each twenty-four hour period of duty to prove that they are in compliance with government regulations. These log books are often altered or purposefully misplaced. Di Salvatori (1989) reported that a majority of truck drivers believe that most of their peers routinely drive longer than the rules allow. A study in Australia by Arnold, Laurence, Carry, Hochstadt, Penna, & Feyer (1995) compared work hours of truckers in regulated (restricted work hours) versus unregulated (no work hour restrictions) states and found comparable work hours between the two. This study suggested that federal regulations may do little to curb total work hours on the road

There is mounting evidence that supports reconsidering the current federal restrictions on the trucker's hours at work. Recent studies on trucker fatigue have indicated that perhaps limiting driving hours may exclusively not solve the problem of decreased performance at the wheel. The Commercial Vehicle Driver Fatigue and Alertness Study demonstrated that night driving (midnight to six a.m.) was associated with worse performance on each of four important criterion variables (drowsiness, lane tracking, code substitution, and sleep length), whereas hours of driving and number of consecutive trips had little or no relationship to those criterion variables (Wylie, Schultz, Miller, Mitler, Mackie, 1996). It was concluded that "time of day was a far better predictor of decreased driving performance than time on task or cumulative number of trips" (Wylie et al, 1996, p.8). This finding conflicts with the rationale for the controversial hours-of-service regulations, which may actually force more night-time driving as the truckers comply with the ten hours on and eight hours off schedules. A study in Australia by Feyer, Williamson, & Friswell (1997) provided supporting evidence for assessing the trucker's global pattern of driving and not just actual hours spent driving consecutively. Feyer et al concluded that the effective management of fatigue involves consideration of the whole pattern and timing of work and rest, including recent patterns of work and rest, activities before driving began, and the way trips were structured in terms of timing and periods of work and rest.

Mitler, Miller, Lipsitz, Walsh and Wylie (1997) evaluated the sleep habits of 80 long-haul truck drivers and concluded that the drivers averaged 4.78 hours of sleep per day, about two hours less than their reported ideal sleep, with incidental findings of two

drivers that met the polysomnographic criteria for sleep apnea. This study concluded that the subjects did not obtain enough sleep required for on the job alertness, with the greatest time of vulnerability being the late night and early morning. Stoohs, Bingham, Itoi, Guilleminault, and Dement (1995) recorded 24 hour electrographic data of eighty long-haul truck drivers and concluded that drivers who had been driving commercial long-haul for more than one year "were more likely to present daytime fatigue, daytime tiredness, un-restorative sleep, hypertension, and higher body mass index" (p.1275).

The consequences of sleep disturbances are plentiful, and they include: 1) an increased tendency to fall asleep during normal waking hours if less than six hours of sleep were obtained; 2) impaired psychomotor performance if less than five hours of sleep were obtained in two consecutive nights; and 3) inattention and an increased number of errors correlated with less sleep (Mitler et al, 1997). Unfortunately, studies have demonstrated that self-reports of fatigue are inaccurate, as the majority of truckers fail to recognize severe fatigue (Wylie et al, 1996). Arnold et al (1995) reported that drivers appeared to be over confident about their own resilience to fatigue, but were able to recognize others truckers at risk of experiencing fatigue while driving. The authors concluded that "initiatives to raise drivers' awareness of fatigue should address the problem of perceived personal invulnerability" (p. 476).

Forty-six percent of ninety long-haul truck drivers undergoing monitoring of heart rate, snoring sounds, oxygen saturation, and body position/movement during sleep were considered to have abnormal breathing (Stoohs, Guilleminault, Itoi, & Dement, 1994). Sleep disordered breathing places a truck driver at a two-fold higher accident rate per

mile than drivers without this syndrome, and the frequency of accidents increases proportionately with the severity of sleep disordered breathing (Stoohs et al, 1995). Increased levels of daytime sleepiness are related to increased upper airway resistance. The higher incidence of sleep disordered breathing in the trucker population is associated with obesity. Obese truck drivers are at a significantly higher risk of causing driving accidents than non-obese truck drivers due to increased daytime sleepiness as a result of increased level of sleep disordered breathing (Stoohs et al, 1994).

Overnight rest appears to be an important factor in reducing fatigue and drowsiness at the wheel. The late night and early morning hours are particularly hazardous for drivers. Avoidance of driving during the dawn hours (4-6 a.m.), a particularly vulnerable time, may help the trucker avoid accidents (Williamson, Feyer, & Friswell, 1996). The Commercial Motor Vehicle Driver Fatigue and Alertness Study noted that in driving periods between ten p.m. and six a.m., the drivers were at an eight fold increase over daytime levels in the amount of video samples judged drowsy (1996). The latter study also concluded that time of day was the strongest and most consistent factor influencing driver fatigue and alertness due to the effects of 24-hour biological rhythms, known as circadian rhythms.

Hazardous Exposures

Life as a trucker brings with it many hazardous exposures. Vast improvements in truck design have improved the internal environment of most modern trucks, but high

levels of noise, diesel fumes, vibration, and travel hazards are common. A discussion follows on each of these hazardous exposures.

Noise

Excessive noise may cause hearing loss or defective hearing and also increase heart rate, blood pressure, respiratory rate and muscle tension (van den Heever & Roets, 1996). van den Heever and Roets conducted a study with two newer styled trucks. The authors discovered that many other variables in addition to engine noise contributed to the overall noise level for the trucker. These variables included: 1) wind; 2) open windows; 3) noise of passing vehicles; 4) the cooling fan; 5) tires of the vehicle; 6) road surface; 7) rattling of body work; 8) door slamming; and 9) the exhaust. The authors concluded that truck drivers in this study "pursue a career where noise-induced deafness is a risk factor to be considered seriously" and they recommended that "drivers of such trucks wear hearing protection devices while driving" (van den Heever & Roets, 1996, p. 566). The authors neglected to address the safety issues of wearing such devices while driving, however, especially in urban areas where hearing a warning horn honk could be invaluable in preventing an accident.

Diesel Exhaust

Diesel fuel is used to power large trucks. Diesel fuel contains "large quantities of carbonaceous particles to which are absorbed polynuclear aromatic hydrocarbons and other heterocyclic compounds (mostly nitroarenes), known to be mutagenic as well as carcinogenic both in animals and in humans" (Boffetta, Stellman, & Garfinkel, 1988,

p. 403). Diesel exhaust is considered a probable human carcinogen by the International Agency for Research on Cancer. Steenland, Deddens, and Stayner (1998) summarized their data on the cumulative effects of diesel exhaust exposure by noting "a positive and significant increase in lung cancer risk with increasing estimated cumulative exposure to diesel exhaust among workers in the trucking industry" (p. 228). Hansen (1993) reported that truck drivers displayed an excess cancer mortality mainly due to respiratory cancer because of exposure to diesel fuels. Exposure to diesel fuel occurs through holes in the floor where the control pedals are located or through an open window. Other sources of exposure include time spent directly outside the truck while loading and unloading, or passing time in truck rest areas where hundreds of trucks often accumulate and leave their engines idling for hours.

Studies also report increased incidences of bladder or colon cancer and multiple myelomas in persons in the trucking industries. These studies have failed to clearly explain whether this increased risk stems from diesel exposure, poor diet, increased prevalence of smokers among truckers, and/or a sedentary lifestyle (Hansen, 1993; Silverman et al, 1989). It is likely that a combination of these confounding factors contribute to a synergistic effect for increasing cancer rates.

Cigarette Smoking

Cigarette smoking is prevalent among truckers. Korelitz et al (1993) found in their study of 2,945 truckers that more than 50% of drivers admitted to smoking one to two packs per day . Long hours of monotony on the road and the highly addictive nature of

nicotine contributed to this high percentage. Additionally, it is difficult to quit smoking without social support or the ability to avoid the habit-inducing atmosphere of the cab. The high addiction of truckers to smoking is tragic in that smokers have "twice the risk of heart disease, six times the risk of emphysema, ten times the risk of lung cancer, five to eight years shorter life span, and more wrinkles" (Uphold & Graham, 1998, p. 99).

Vibration

Vibration is a hazardous exposure inherent in the trucking industry. Vibration is defined as "the motion (oscillating, reciprocating, or otherwise) that forces a body or medium out of a position or state of equilibrium" (LaDou, 1988, p. 960). Magnusson, Pope, Wilder, & Akerskoug (1996) noted that seated whole body vibration (WBV) is the most common vibratory exposure in occupational life, and, probably the most hazardous regarding back problems. The older model trucks vibrated with a frequency up to 20 hertz (Hz), while vibration in only the 2-7 Hz frequency range is capable of producing major physiologic changes (LaDou, 1989). Trucks have significantly advanced in design in the past five years, but vibration has not been eliminated entirely. Animal experiments have shown that WBV leads to poorer vertebral disc nutrition and an accumulation of metabolites. The accumulated metabolites are believed to stimulate the degenerative process of the discs (Holm & Nachemson, 1996). Additionally, truckers have been found to have a significantly higher incidence of bone deformities and vertebrogenic pain syndrome, hemorrhoids, kidney disease, and peptic ulcer. LaDou (1998) linked all of

these disorders to vibration exposure, but acknowledged diet and exercise as confounding variables.

A synergistic effect takes place when vibration is combined with heavy and/or frequent lifting, resulting in low back pain. Korelitz et al (1993) reported that 14.9% of truckers have been told by their physician that they have a back problem, and 31.6% have experienced a backache in the past one month. While proper lifting mechanics can help alleviate back problems, there is relatively little the trucker can do to prevent WBV other than try to drive a newer model of truck. These trucks are designed with air-suspension seats reported to decrease WBV.

Road Safety

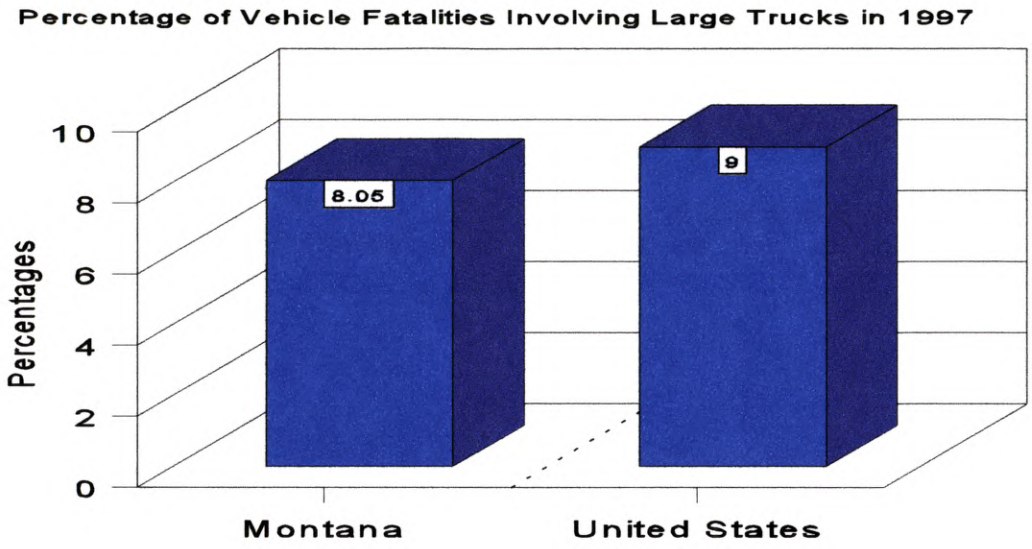
One out of eight traffic fatalities in the United States in 1997 resulted from a collision with a large truck. Yet, large trucks accounted for only 3% of all registered vehicles and only seven percent of total vehicle miles traveled. Only 1.1 % of the drivers of the large trucks were intoxicated. Eighty-six percent of the fatalities involving large trucks were either occupants of other vehicles or pedestrians or pedacyclists. Most of the fatal crashes involving large trucks occurred in rural areas (67%), during the daytime (66%), and on weekdays (79%), (U. S. Department of Transportation, 1997).

Montana is a vast rural state, the fourth largest in the nation, with 69,000 miles of public highways and interstates interconnecting towns and cities. Mountains and windswept prairies characterize the terrain. Long distance travel to and from rural towns and farms is common. Montana's rural residents comprise 47.5 % of the state's

population (Census and Economic Information Center, 1997). Indeed, 75 % of Montana's Vehicle Miles takes place outside of the fourteen urban areas, making Montana the third most rural transportation system in the United States (Census and Economic Information Center, 1997).

In 1997, Montana fatal truck accidents were 8.05% of the total vehicles involved in fatal crashes, compared to the national average of 9% (see Figure 2). This might be considered a low percentage, considering the rural nature of the state and its lengthy highway system. Despite the current "reasonable and prudent" speed limit, trucks are confined both day and night to 65 miles per hour (MPH) on interstates and 55 MPH on the rural highways. Additionally, all Montana vehicles must slow down to 65 MPH after the sun sets. These limits are actually slower than many states' limits, which allow for 75 MPH for all vehicles, both day and night.

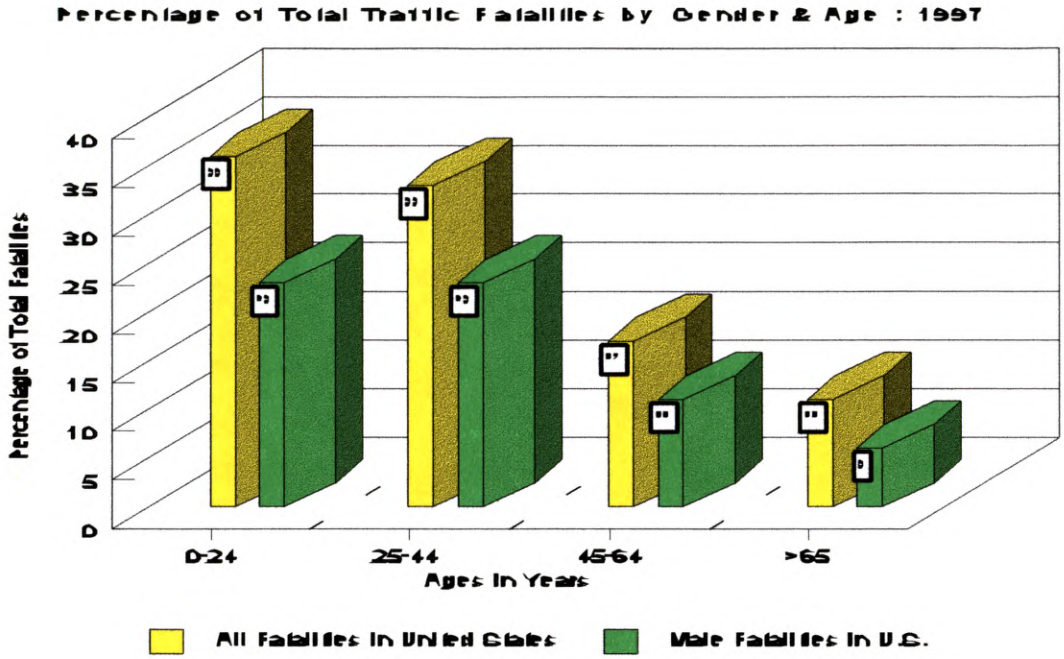
Figure 2. Percentage of Vehicle Fatalities Involving Large Trucks in 1997



U. S. Department of Transportation, National Highway Traffic Safety Administration (1997)

Driver age and gender heavily influence the incidences of traffic fatalities. Campbell found in his discussion of fatal large truck accidents by age that "drivers under the age of 21 are over-involved by a factor of 6 in comparison to the overall rate for all drivers" (1991, p. 287). Fatalities in general are impacted by young drivers, who represent 35 % of all fatalities in our nation. Young males drivers comprise 28 % of the fatality total (see Figure 3). Campbell points out that "if the minimum trucker age were lowered to nineteen, these new drivers of commercial trucks would be expected to have fatal accident involvement rates 2-3 times the overall rate for commercial truck drivers" (1991, p. 287).

Figure 3. Percentage of Total Traffic Fatalities by Gender and Age.



U. S. Department of Transportation, National Highway Traffic Safety Administration (1997)

Diet and Exercise

Ask most anyone's opinion of the trucker's lifestyle, and their likely response is "bad diets and little exercise". The Korelitz et al (1993) study supported this generalization as it demonstrated that half of all trucker drivers never exercised, 8% exercised regularly, more than 80% had irregular eating patterns, and 74% were either over weight or obese. The benefits of exercise, eating a healthy diet, and ideal body weight are plentiful and receive much publicity in the modern press. Beyond the obvious, obesity also contributes to sleep-disordered breathing and increases the risk of

involvement in a traffic accident (Stoohs et al, 1995). Additionally, increased fiber in the diet can decrease straining and thus decrease the incidence of hemorrhoids.

Limited availability of healthy food choices and space to exercise influence the truckers' seemingly bad habits. Life on the road leaves most truckers scrambling either to make deadlines or feeling dead-tired when their truck stops. Time is not budgeted for exercising or scurrying about in search of healthy food. Maneuvering a large truck through unknown towns or cities in search of better food choices or exercise facilities is difficult. While loading and unloading can be counted as exercise, many truckers today do not even perform this activity, relying on crews at the dock points to perform this duty with mechanized machines. Limited budgets on the road influence food choices and ability to pay for the use of gyms. Bad weather or dark unknown habitats frequently prohibit outdoor exercise. Overall, the trucking environment is hostile to a healthy diet and exercise.

Psychosocial Factors

Stress is inherent to the trucker's life. Dr. Briggs, the 'truckers' doc', defines stress as the "internal early warning system that alerts you to danger and starts a chain of events within the body that prepares you mentally and physically, to 'fight or flee' a threatening situation" (1997, p. 1). Frequent stressors on the trucker's life includes deadlines, finances, traffic congestion, weather, isolation, poor road conditions and truck break-downs. Averaging six to eight nights home per month does little to promote a happy home environment. Meeting a deadline 1000 miles a way while the truck is broken down

by the side of a rural road does little to promote inner tranquility either. Appendix E contains a poem written by trucker Daniel Filey characterizing the loneliness and stress that a trucker on the road may experience.

The poor health outcomes of the trucker may frequently be related to a hostile work environment and limited health care. Choices of where and when to stop the truck are constrained by logistics and schedules. The places where the trucker does stop dictate what types of food and leisure choices are available. Because the trucker tends to rely on DOT physicals for health care, he or she gets little emphasis on health screening or promotion. The collective impact of this hostile environment and limited health care results in poor health for the trucker. The following section discusses the concepts of environment on health.

Thinking Upstream

Most persons make choices that are convenient and pleasurable, but not necessarily healthful to their person (Milio, 1976). Milio suggests that people's behaviors will change when health generating choices are more accessible, and health damaging choices are less accessible. The current working environment for long-haul truck drivers is usually full of health damaging choices.

Butterfield (1990) asserted that it is necessary for nurses to promote health in individuals and groups by gaining an understanding of the complex social, political, and economic forces that shape people's lives. "Upstream thinking", Butterfield contended, represents looking up the stream of life to identify stimuli that influence peoples

behaviors (1990, p. 2). This type of thinking requires a focus on "modifying economic, political, and environmental factors that have been shown to be the precursors of poor health throughout the world" (Butterfield, 1990, p. 2).

Much upstream thinking needs to be done for the truck drivers of this country. Cognizant of the need to modify the transportation environment, Sedor (1997) noted that:

> Although safety, energy efficiency, and emissions controls have improved, transportation policies, regulations, and technological advances are still racing to keep up with the continued growth in travel and goods movement. The ability of the transportation system to meet our logistical and personal mobility needs with a minimum of impact on our pocketbooks, our safety, and the environment depends on informed decisions by public agencies, private enterprises, and individuals (p. 3).

The push for wise public decision making with community input should be welcomed. Nurses can participate in this input by advocating for a healthier transportation environment to enhance the lives of long-haul truck drivers.

Healthy People 2000 has set a goal of improving health care access for patients by providing services in areas patients already frequent (Kidd & Robinson, 1998). Additionally, the American Nurses Association's (ANA) 1992 publication, titled Nursing's Agenda for Health Care Reform, emphasized that primary care services be delivered in workplaces, schools, and other community settings (Kidd & Robinson, 1998). Access to care became a reality for many truckers when Sharon Kott, an occupational health nurse, developed a trucker's clinic in Maryland (see Appendix F for letter from Ms. Kott). Ms. Kott and Dr. Briggs began and continue to maintain a clinic that serves truck drivers and is adjacent to a busy truck stop in Maryland. Ms. Kott reported impressive results with positive customer satisfaction. The trucker clinic has

expanded three times in the three years that it has been in business, showing that when health care is accessible, it is utilized.

The following section includes a discussion of interventions that may benefit the long-haul truck driver. The areas of the DOT physical, sleep and fatigue, hazardous exposures, diet and exercise, stress and upstream thinking are addressed. The interventions were derived from the review of the literature.

Interventions for the Long-haul Trucker

DOT Physicals

The trucker must obtain bi-annual DOT physicals in order to maintain his commercial driver's license. This provides the nurse with an excellent time to provide client education. Motivation for the trucker to comply with health-oriented recommendations could be stimulated through discussion of the conditions that preclude driving as dictated by the FMCSR. The driver needs information to understand that a longer career as well as a healthier retirement may result from early prevention efforts. The DOT physical forms should be expanded to include documentation of client risk factors. The education provided to the driver so that these risk factors are decreased should also be documented. While the importance of protecting the public from unsafe drivers is crucial, the current paradigm of medicine that focuses only on disease detection in the DOT driver needs to be shifted to also include health promotion.

Sleep and Fatigue

Primary care providers need to be alert to the effects of cumulative fatigue and sleep deprivation on truck drivers. A responsibility exists to "educate workers and schedulers about the importance of adequate sleep with respect to public safety" (Mitler et al, 1997, p. 761). Administering a self-assessment quiz such as the "Driver Fatigue Quiz" (see Appendix G) and offering fatigue-recognition education in the office may help drivers recognize their own misperceptions about fatigue. Drivers and dispatchers need to incorporate adequate sleep as a part of their personal value system.

Schedules could be adjusted around sleep time, versus driving time, as well as drivers themselves placing a higher priority on sleep in off duty time. The work schedule should minimize: (1) exposure to night work; (2) shifts rotating more frequently than once every two to three weeks; (3) the number of consecutive night shifts worked from seven to four or five; and (4) the duration of the night shifts (Czeisler & Richardson, 1998) Tolerance of occasional unscheduled naps would also improve safety on the road. Preliminary research suggests that some individuals are more resilient to night time fatigue than are others (Wylie, Schultz, Miller, Mitler, & Mackie, 1996). Thus, the provider may help an individual trucker to identify his or her ability to safely maintain a night time driving schedule.

Cancer Risk Factors

The danger exists for truck drivers to gain a false sense of security from their biannual DOT exams. The truckers may mistakenly assume that they receive a comprehensive

physical, when indeed they are merely being screened for health conditions that can prove hazardous to their ability to drive safely. This assumption only makes sense if the ability to drive safely may be used as a measurement of good health. Health care providers need to be aware of increased cancer rates among truckers. Routine screening exams should take place at different stages of a client's life, and nurses can insure that these are provided appropriately to the long-haul truck driver. Consideration of age, gender, and length of time exposed to hazardous materials can help guide whom, when, and why to screen.

Anticipatory guidance should include topics such as smoking cessation advice (see Appendix G) and encouraging the driver to pay attention to potential exhaust leaks into the cab. Given that truckers are a mostly sedentary group with high rates of smoking and high fat diets, aggressive screening for cancer is warranted. Appendix C provides health screening guidelines for adults. If the provider does not provide such screening in the office, the trucker should be advised of what screening is due and where it can be received.

Noise

Drivers can be advised to keep their noise exposures as low as possible by keeping windows rolled up, stereos at a medium to low level, and fans and mufflers working efficiently. Driving newer models of trucks is optimal to reduce noise levels, but this is not always possible for many truckers.

Vibration

The primary care provider should be aware of the impacts of vibration while performing an assessment. Certainly obtaining the duration of the trucker's career as well as the year of the truck currently driven will provide essential assessment data. Referrals to orthopedics, physical therapy, and occupational therapy may be necessary.

Safety

Health care providers can encourage drivers to follow many safety precautions. Use of seat belts is the most obvious precaution. Adherence to speed limits decreases mortality, consequently time for slower speeds needs to be allocated into the overall travel time budget. Young drivers especially need to be aware of their increased susceptibility to traffic fatalities. Safety advice the nurse can reinforce at each client visit includes: use seat belts; drive within speed limits; do not drive if sleepy or fatigued; and be familiar with the maintenance procedures for all vehicle systems (NIOSH Alert, 1998).

Diet and Exercise

While some progressive truck stops are incorporating shops that serve lower fat sandwiches or pre-made salads, very few other food choices that are affordable and quick are offered. As expected, these same sandwiches and salads offered by many chain stores become tiresome after many months, if not years, on the road. Truckers can be encouraged to carry coolers with fresh fruits and vegetables, and stock up on low fat foods from their local grocery store before departure on their trip. They can also request

non-fried foods such as boiled rather than fried eggs. Truckers need information about the five food groups reinforced at each clinic visit. It would also be helpful to hand out materials that discuss quick-choice low-fat foods.

Approaches to increase exercise should be introduced to the trucker at each visit. Simple strategies such as parking at the far end of the lot, walking around the truck or the entire rest area several times, and stand-in-place activities such as jumping jacks or jump-rope can be suggested. Appendix I provides a sample of exercises that can be recommended to the trucker while in the cab of the truck. The trucker should know that an increased heart rate for more than a twenty minute duration is optimal.

Psychosocial Interventions

A nurse may see the trucker in the clinic bi-annually for DOT exams, episodically, or on a continued basis. It is often difficult to incorporate meaningful therapeutic advice into first and/or short clinic encounters. The BATHE technique may help the provider promote meaningful interchanges. BATHE is an acronym to remind the provider to identify the following key points in the patient interview: the *B*ackground situation, the patient's *A*ffect, the problem that is most *T*roubling for the patient, the manner in which the patient is *H*andling the problem, and concluding with an *E*mpathetic response given by the provider (McCulloch, Ramersar, and Peterson, 1998). This technique facilitates empathy and positive regard by the provider, and allows the provider to "validate the patient's existing coping strategies or work with the patient to devise new methods of dealing with distress" (McCulloch et al, 1998, p. 2134).

Dr. Briggs, in his June of 1997 on-line trucker's health page, included an excellent review of "stress weapons" for the trucker (see Appendix J). The advice includes emotional, physical, and behavioral "stress weapons" specifically for truckers. Nurses could recommend several of the these self-help techniques to patients.

There are on-line trucking web sites focused on health, two examples include "Healthy Lifestyles" by trucker Steve Krott or "The Truckers Doc" by Dr. Michael Briggs (on-line services, 1997). Both of these men provide a monthly web page focused on health issues relevant to the truck driver; such as the effects of stress on the body, the need for proper diet and exercise, or even the etiology and care of hemorrhoids. As additional sources of support, the nurse practitioner could provide relevant Internet addresses for computer literate clients.

Isolation from friends and family, especially children, can be the most stressful part of the trucker's career. Kathleen Hatt (1997) recommends several ways to stay in touch on the road that the nurse could recommend to the trucker. Several strategies that may be recommended to the client include: 1) small notes left behind for the family to delightfully discover throughout the week; 2) a map of the United States left out for the family to track the truck route; 3) sending occasional scenic post cards of where the route has been; 4) taking a calender of family special events on the road, and asking about the school plays or soccer matches; 5) if rules allow, taking the family along on occasional trips; 6) calling home as often as financially possible, or leaving answering machine messages when it is known that no one is home; and 7) recording letters on micro-cassettes, including descriptions of the trip and sights along the way. Most of these

recommendations are inexpensive and easy, and could help the trucker stay connected with his or her home community.

Thinking Upstream

As previously discussed, the working environment for the truck driver is a hostile one. Nurses can take an active role to generate concern for the trucker's adverse working conditions in the political arena. Appendix K includes an example of an advocacy letter that may promote regulatory changes concerning the DOT physical. This letter seeks to incorporate health promotion and routine health screening into the DOT physical, broadening the provider's primary responsibility to include the patient, not just the public.

Another action federal or state governments should be prompted to take would be to install rest areas along roadways that include walking tracks with exercise stations. Government should also mandate that large truck stops provide an exercise area for the truckers as well as healthier food choices. OSHA should be involved in monitoring the diesel fuel emissions from several hundred trucks collectively left idling for hours on small truck stop parking lots as the truckers sleep.

Some of the larger truck-stops have made limited attempts at providing healthier choices for their customers. Sandwich shops or other healthier food choices have slowly been replacing traditionally greasy food kitchens. Rarely, a gym will be available for trucker use. Ideally, the corporations that own the large truck stops would place food plazas with a variety of healthy but tasty food choices, such as rice dishes, pitas, and vegetarian cuisines. Additionally, areas for basketball, horseshoe pits, exercise bikes, and

other space-efficient activities could be conveniently located for the trucker (Chenowith, 1990). Nurses can advocate for these changes. See Appendix L for a letter by Ms. Kott describing the advocacy she and her clinic have provided for the truckers in their area.

Nurse educators and nurse practitioners can think upstream by incorporating occupational health concepts into their curriculums and into their practices. While there is an entire branch of medicine dedicated to the study of occupational health, one wonders how much the general practitioner pays attention to the effects of occupation on health. One may also wonder if there is enough education provided to the study of occupational illness for the generalists and specialists alike. Pope and Rall (1995) propose that every primary provider have the following knowledge skills:

1. understand the influence of the environment and environmental agents on human health based on knowledge of relevant epidemiologic, toxicologic, and exposure factors,

2. be able to recognize the signs, symptoms, diseases, and sources of exposure relating to common environmental agents and conditions,

3) elicit an appropriately detailed environmental exposure history, including a work history, from all patients,

4) be able to identify and access the informational, clinical, and other resources available to help address patient and community environmental health problems and concerns,

5) be able to discuss environmental risks with their patients and provide understandable information about risk-reduction strategies in ways that exhibit sensitivity to patients' beliefs and concerns, and

6) be able to understand the ethical and legal responsibilities of seeing patients with environmental and occupational health problems or concerns (p.3).

These are all reasonable and obtainable goals. Many of these goals are already met by current FNP programs.

Poor access to health care makes it difficult for long-haul truckers to choose to take better care of themselves. Nurse practitioners are in an excellent position to start and maintain trucker clinics in their own communities. The information from this project could be utilized for services provided at a trucker clinic. The clinic should be located at or near a truck stop to improve access for truck drivers.

CHAPTER THREE

METHODOLOGY

The project was designed to increase the knowledge of the author, other nurses, and long -haul truckers. Purposes of the project were to 1) provide background information needed for nurses to enhance health care of the long-haul truck driver, and 2) produce a health promotion pamphlet suitable for distribution to individual long-haul truckers. Long-haul truck drivers were defined through use of government occupational headings. A comprehensive review of related literature was conducted using Med-Line and CINAHL search engines, Department of Transportation and other government web sites, as well as trucking web-sites. Systems theory, Roy's Adaptation Model of Nursing, and Transcultural Nursing Theory were utilized as conceptual frameworks for this project. The following discussion delineates how the project purposes were achieved.

Long-haul truck drivers were interviewed by Wallis and Polich (1997) in conjunction with the course "Rural Health: Needs and Perceptions". The interview focus was on long-haul truckers' current health status and the barriers they faced in obtaining or maintaining optimal wellness. Specific health obstacles of the trucker on the road were identified. These obstacles included: time constraints; stress; inactivity; isolation with impaired family relations; limited dietary choices; the usual dangers of travel; poor access to health care providers; sleep disturbances and fatigue; hazardous exposures; and participation in unhealthy and habit forming behaviors. That most truckers receive

inadequate health care despite bi-annual DOT physical exams was identified from the review of the literature.

Nursing interventions to address the health needs of the long-haul truck driver were derived from the literature review. Based on these interventions, a health promotion pamphlet suitable for distribution to individual long-haul truckers was developed. The goal of the interventions included in the pamphlet was to promote adaptation of the long haul trucker to the system in which he or she exists. Montana State University's College of Graphic Design was contacted to find an art student willing to prepare the health promotion pamphlet. Erik Faes volunteered for the project, which will be included in his sample portfolio.

The pamphlet cover was mutually decided upon by the author and the artist after suggestions were provided by Mr. Faes. The design of the cover was intended to attract truck drivers. It was decided that the title of the pamphlet would be "Guidelines for Long-haul Health" (see Appendix M). A truck rig was also depicted on the cover to spark trucker interest.

The language throughout the pamphlet was intended to be familiar and of interest to a trucker. Pamphlet content was provided to Mr. Faes by the author, and editing was then co-managed. Healthy lifestyle choices that would be realistic while on the road were offered. Interventions included in the trucker pamphlet were aimed at reducing the impact of the trucker's environment on sleep and fatigue, hearing, cancer risk, diet and exercise, isolation, and stress. Activism ideas for the truckers to improve their own working conditions were also included. The tone of the pamphlet was light and

informative. Interventions chosen for inclusion in the pamphlet were meant to be realistic and achievable by the trucker. A mix of idealism with realism set the tone for the interventions.

Another goal set for the pamphlet was that the trucker would not feel alienated by the information. For example, in the pamphlet the trucker is encouraged to sleep more than six hours per day, rather than sleep an unrealistic yet optimal eight hours every night. An idealistic intervention, such as eight hours of sleep nightly, may cause the trucker to disregard much of the information included in the pamphlet as unrealistic advice. Another example of advice in the pamphlet includes night shift driving, which is often unavoidable despite being more dangerous for the driver. The trucker is encouraged to stop and sleep at least two hours between twelve midnight and six a.m. if total avoidance of night shift driving is not feasible. This more realistic approach for most drivers can greatly reduce the risk of fatigue related accidents, despite not totally eliminating the increased danger of night time driving. A balance between optimal and realistic guidelines is sought. In this manner, the pamphlet suggests simple tools the trucker may utilize in real life.

The pamphlet also recommends that the trucker be involved in shaping his or her environment. For example, the truckers are encouraged to ask for healthier eating choices at truck stops. They are also encouraged to ask for more complete physicals that include health screening and education. The trucker is encouraged to recognize himself or herself as a powerful consumer who may positively influence his or her environment.

The pamphlet was designed for the long-haul trucker, and optimally would be provided to the trucker by nurses in the clinic setting, but could also be distributed in convenient truck stop locations. The nurse and the trucker would discuss the pamphlet contents directly following the trucker's DOT physical exam. Key areas of the pamphlet most pertinent to the individual trucker could then be highlighted.

This project also sought to provide background information needed for nurses to enhance health care of the long-haul trucker. The long-haul truck driver was identified as part of a larger system and as possessing a unique culture. This framework allows nurses to gain a holistic perspective of the truck driver. The goal of the nurse caring for the long-haul truck driver was identified as promoting adaptation of the trucker to his or her environment.

Publication of an article will evolve from the information gathered in this project, thus making the information widely available to nurses. The gathered information will also be presented at a nursing seminar, or as a continuing education project for nurse practitioners. A trucker oriented health clinic, owned and operated by nurse practitioners, could also utilize information gathered in this project to provide more holistic nursing care of its clients.

The trucker pamphlet will be distributed to interested nursing professors at Montana State University to be included in their class content. Public health and family nurse practitioner faculty will be targeted by the author. Additional information generated by the project will be provided per faculty request to supplement the pamphlet information. The pamphlet information could also be distributed to clinics, such as occupational or

family practice clinics. Seminars could also be provided to interested staff members of these clinics by the author.

CHAPTER FOUR

PROJECT OUTCOME

Evaluation of Results

This project successfully identified many options for health promotion of the trucker in the long-haul trucking industry. The trucker's system was assessed comprehensively and an extensive review of the literature was conducted. The hostile work environment of the trucker was depicted, and nursing interventions to promote positive adaptation of the trucker to his environment were suggested. Interventions were organized into an accessible health promotion pamphlet designed for the long-haul trucker. Several methods to introduce the information gathered in this project to nurses and other primary care providers were suggested.

Limitations of Project

Female truck drivers' specific health issues were not explored in this project. As a growing number of truckers are female, this area deserves much consideration. Reproductive health of both female and male truck drivers was not specifically discussed, yet this area may significantly impact the trucker's health. Cardiovascular disease is more prevalent in the trucking industry, and was not investigated for this project. Many truckers exist in isolation at the periphery of society, with opportunity to participate in

deviant behaviors a realistic possibility. Sexually transmitted diseases, prostitution at or near truck stops, and illicit drug use were not addressed in this project. Additionally, exploration of the trucker's collective ability to pay for more holistic health care was not assessed. Holistic assessment of the long-haul truck driver would include the previously mentioned topics.

Implications and Recommendations Derived from the Project

Implications for Practice

Nurse practitioners take pride in addressing clients in a holistic manner, as well as in providing health care to vulnerable populations. This project has identified long-haul truck drivers as a unique, albeit neglected, subculture of American society. Despite increased risk factors, long-haul truckers were noted to have limited access to health care as well as insufficient health care when it was provided. Nurses can become leaders in promoting holistic care of the long-haul truck driver.

Nurses can utilize the health promotion pamphlet included in this project to promote trucker's adaptation to the hostile environment of the trucking industry. Nurses can also be pro-active for the trucker by lobbying pertinent agencies for constructive changes in the trucker's most immediate environment. Education of colleagues as to the specific health needs of the long-haul truck driver could enhance care of these individuals. Critical review of ongoing research pertinent to the trucker should be evaluated and incorporated into practice as is indicated. Most importantly, the DOT physical exam should be seen as an opportunity for nurses and nurse practitioners to comprehensively

assess the trucker and provide appropriate health screening as well as education which would promote healthy lifestyle behaviors.

Implications for Nursing Education

Nurse educators are responsible for relaying much pertinent information in a very short time to their students. Occupational health issues are often included in nursing curriculum in a very general manner. The number of the occupations in this world is staggering, yet each may carry specific health implications for its laborers. Deciding what health issues to include or exclude in a curriculum may be particularly burdensome for faculty. The plight of the long-haul trucker deserves particular consideration, however. Almost all that we appreciate in our material world may be partly contributed to the laborer known as the long-haul trucker. One of the most commonly performed exams in the family practice setting is the DOT physical exam. Nurses should be knowledgeable about this exam for legal as well as professional reasons. Nurses can establish themselves as leaders in health promotion for the long-haul truck driver.

Nursing educators should include an overview of the DOT exam in their curriculum. Risk factor assessment as well as health education should be taught as essential parts of the DOT physical exam. Use of educational tools by the students, such as the pamphlet developed in this project, should be encouraged by nurse educators. Development and participation in ongoing research related to long-haul truckers should also be encouraged by nursing education.

Implications for Future Research

There are many opportunities for future research when considering the long-haul truck driver. Specific smoking cessation programs need to be designed for the trucker and field tested. Female truck drivers and their specific health issues could be explored, including the impact of long-haul trucking on fertility and pregnancy. Short haul truckers, bus drivers, train engineers, and other participants in the transportation industry may also benefit from many of the interventions identified in this project. Research about health issues affecting these other mobile-oriented occupations could be generated by nurses. Cost analysis for implementing routine screening exams into the bi-annual DOT physical should be explored. A holistic exam form for the DOT physical could be developed and field tested. The feasibility and cost of improving access of care for all truckers is another area where nursing research is needed.

Summary

The long-haul trucker exists within a system that includes a unique culture with unique health needs. Long-haul truckers are identified as vital to our nation's livelihood. The current paradigm of health care for the long-haul trucker is oriented to public safety and detection of specific disabling diseases. Primary prevention is left out of this current paradigm, and most truckers receive sporadic episodic care at best. Nurses may positively impact the well-being of the long-haul truck driver through holistic assessment of individual risk factors and implementation of biopsychosocial nursing interventions.

A new paradigm of health care focusing on primary, secondary, and tertiary prevention needs to be adopted as priorities of care for the long-haul trucker.

Long-haul truck drivers have been identified as a vulnerable population. Nurses are in a unique position to help promote positive adaptation of truckers to a dynamic and hostile environment. Awareness of sleep disturbances and fatigue, hazardous exposures, habit forming behaviors, poor nutrition and inactivity, stress and impaired family functioning, as well as the usual dangers of travel will allow nurses to better service the trucker. Improved access to health care would remove an onerous barrier for the trucker on the road. Additionally, nurses can think upstream and petition both government and those businesses that profit most from truckers for improved work environments.

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APPENDICES

Appendix A: DOT Physical Exam Form

Source: Federal Motor Carrier Safety Regulation, 49 CFR, Part 391.41.41-49; Subpart E - Physical Qualifications and Examination. U. S. Department of Transportation, 1997.

EXAMINATION TO DETERMINE PHYSICAL CONDITION OF DRIVERS

Driver's name _____ ☐ New Certification
(Please Print) (Last) (First) (Middle)

Address _____ ☐ Recertification
(Number) (Street) (City) (State) (Zip)

Social Security No. _____ Date of Birth _____ Age _____

HEALTH HISTORY

Yes	No		Yes	No		Yes	No		Yes	No	
☐	☐	Head or spinal injuries.	☐	☐	Cardiovascular disease.	☐	☐	Gastrointestinal ulcer.	☐	☐	Suffering from any other disease.
☐	☐	Seizures, fits, convulsions, or fainting.	☐	☐	Tuberculosis.	☐	☐	Nervous stomach.	☐	☐	Permanent defect from illness, disease or injury.
☐	☐	Extensive confinement by illness or injury.	☐	☐	Syphilis	☐	☐	Rheumatic fever.	☐	☐	Psychiatric disorder.
			☐	☐	Gonorrhea.	☐	☐	Asthma.	☐	☐	Any other nervous disorder.
			☐	☐	Diabetes.	☐	☐	Kidney disease.			
						☐	☐	Muscular disease.			

If answer to any of the above is yes, explain: _____

PHYSICAL EXAMINATION

General appearance and development: Good _____ Fair _____ Poor _____ Height _____ Weight _____

Vision: For distance: Right 20/_____ Left 20/_____

☐ Without corrective lenses. ☐ With corrective lenses if worn.

Evidence of disease or injury: Right _____ Left _____

Color Test _____ Horizontal field of vision: Right _____° Left _____°

Hearing: Right ear _____ Left ear _____ Disease or injury _____

Audiometric Test (complete only if audiometer is used to test hearing) decibel loss as 500 Hz _____, at 1,000 Hz _____, at 2,000 Hz _____

Throat _____

Thorax: Heart _____

If organic disease is present, is it fully compensated? _____ Blood pressure: Systolic _____ Diastolic _____

Pulse: Before exercise _____ Immediately after exercise _____

Lungs _____

Abdomen: Scars _____ Abnormal masses _____ Tenderness _____ Hernia: Yes _____ No _____

If so, where? _____ Is truss worn? _____

Gastrointestinal: Ulceration or other disease: Yes _____ No _____

Genito-Urinary: Scars _____ Urethral discharge _____

Reflexes: Rhomberg _____ Pupillary _____ Light R _____ L _____ Accommodation Right _____ Left _____

Knee Jerks: Right: Normal _____ Increased _____ Absent _____ Left: Normal _____ Increased _____ Absent _____

Remarks _____

Extremities: Upper _____ Lower _____ Spine _____

Laboratory and other Special Findings: Urine: Spec. Gr. _____ Alb. _____ Sugar _____

Other laboratory data (Serology, etc.) _____ Electrocardiograph _____

Radiological data _____

Controlled Substances Testing ☐ Controlled substances test performed ☐ NOT in accordance with subpart H ☐ In accordance with subpart H
☐ Controlled substances test NOT performed

General comments _____

_____ _____
(Date of examination) (Address of examining doctor)

_____ _____
(Name of examining doctor) (Print) (Signature of examining doctor)

NOTE: This section to be completed only when visual test is conducted by a licensed ophthalmologist or optometrist.

_____ _____
(Date of examination) (Address of ophthalmologist or optometrist)

_____ _____
(Signature of optometrist) (Name of ophthalmologist or optometrist) (Print)

MEDICAL EXAMINER'S CERTIFICATE

I certify that I have examined _____ in accordance with the Federal Motor Carrier
(Driver's name) (Print)
Safety Regulations (49 CFR 391.41–391.49) and with knowledge of his or her duties, I find him or her qualified under the regulations.
☐ Qualified only when wearing corrective lenses. ☐ Qualified only when wearing a hearing aid.

A completed examination form for this person is on file in my office at _____
(Address)

_____ _____ _____
(Signature of driver) (Date of examination) (Name of examining doctor)(Print)

_____ _____
(Address of driver) (Signature of examining doctor)

Appendix B: Medical Conditions that Preclude a Truck Driver from Obtaining a CDL

Condition	Recommendation
Loss of foot, leg, hand or arm	The driver is medically disqualified unless a waiver has been obtained from the regional director of motor carriers. If the driver is otherwise medically qualified, the examining physician should check the statement "medically unqualified unless accompanied by a waiver" on the examination form and certificate.
Impairments of hand or lower extremity	Any significant limb defect that interferes with the ability to perform tasks associated with operating a motor vehicle is disqualifying or requires a waiver (e.g., fused or immobile knee or hip, partial paralysis, etc.).
Insulin-controlled diabetes	A driver taking insulin cannot be certified for interstate driving. However, a driver who has diabetes that is controlled by oral medications and diet may be qualified if the disease is well controlled and the driver is under medical supervision. Documentation from the driver's physician should be obtained. If diabetes is untreated or uncontrolled, certification should not be given.
Current diagnosis of cardiovascular disease	Any condition known to be accompanied by sudden and unexpected syncope, collapse or congestive heart failure is disqualifying. Conditions such as myocardial infarction, angina and cardiac dysrhythmias should probably be evaluated rigorously by a cardiologist before certification is issued. Holter monitors and exercise stress tests may be needed when a driver has multiple risk factors and other questions need to be answered. Tachycardia or bradycardia should be investigated to rule out underlying cardiac disease. Asymptomatic dysrhythmia with no underlying disease process should not be disqualifying.
Established history or diagnosis of respiratory dysfunction	If a driver has clear symptoms of significant pulmonary disease, basic spirometry and lung volume tests are recommended. If the forced expiratory volume in one second (FEV1) is less than 65 percent of predicted value, the forced vital capacity (FVC) is less than 60 percent of predicted or the ratio of FEV1 to FVC is less than 65 percent, pulse oximetry should be performed. If pulse oximetry on room air is less than 92 percent, an arterial blood gas measurement is recommended. If the partial pressure of arterial oxygen is less than 65 mm Hg or the partial pressure of arterial carbon dioxide is more than 45 mm Hg, disqualification is recommended.
Hypertension	If the blood pressure is 160/90 mm Hg or lower, a full two-year certification is appropriate. If the blood pressure is higher than 160/90 mm Hg (either systolic or diastolic) but lower than 181/105 mm Hg, temporary certification may be granted for three months to allow time for the driver to be evaluated and treated. If the initial pressure is 181/105 mm Hg or higher, the driver should not be certified. Once treatment has brought a driver's blood pressure under control, certification should be issued for no more than one year at a time. Note that several readings should be taken over several days to rule out "white coat" hypertension. Significant target organ damage and additional risk factors increase the risk of sudden collapse and should be disqualifying.
Musculoskeletal, neurologic or vascular diseases	Depending on severity, any condition (physical, mental or functional) can be disqualifying if it can significantly impair a driver's ability to control a motor vehicle or to react to emergencies.

Epilepsy	A driver with a clinical diagnosis of epilepsy and recurrent seizures of any etiology should never be certified. A driver who has had an isolated seizure or episode of syncope may be certified, but only if the driver is not taking medications and has been free of seizures for five years following an isolated idiopathic seizure and for 10 years following multiple seizures. Febrile seizures of childhood are not disqualifying. All questionable cases should be cleared by a neurologist.
Mental, nervous, organic or psychiatric disorders	Mental conditions that can affect judgment, perception of reality and reaction times may be disqualifying. When in doubt, the examining physician should have the driver obtain clearance from a psychiatrist or a neurologist. Medications required for mental conditions may be disqualifying if they can alter consciousness or reaction times.
Vision less than 20/40 in each eye	Vision must be at least 20/40 in each eye with or without correction. Certification can be given once vision has been corrected, but not until. The driver should be advised to have his or her eyes evaluated, obtain corrective lenses and then return for certification. Field of vision must be at least 70 degrees in each eye. Color vision must allow recognition of standard traffic signals (i.e., red, green and amber).
Hearing loss of more than an average of 40 dB in the best ear at 500, 1,000 and 2,000 Hz	The driver should pass a whispered voice test at five feet in at least one ear. A hearing aid may be worn for the test. If the test result is questionable, an audiogram is recommended. The better ear must not have an average hearing loss of more than 40 dB at 500, 1,000 and 2,000 Hz (to obtain an average, add the three decibel losses together and divide by 3).
Use of schedule I drugs and consciousness-alte ring drug	Use of a schedule I drug or any other consciousness-altering substance, an amphetamine, a narcotic or any other habit-forming drug is cause for the driver to be found medically unqualified. Use of other prescription medications is not an automatic disqualifier; however, the condition being treated, the medications prescribed and the dosage level must be consistent with the safe performance of the driver's duties
Current diagnosis of alcoholism	The term "current diagnosis" is meant to encompass those instances in which the physical and mental condition of the driver with alcoholism has not fully stabilized, regardless of the time element. If the severity or extent of the problem is uncertain, the examining physician may refer the driver to a substance abuse counselor for evaluation and clearance.

Source: Pommerenke et al, (1998). DOT examinations: practical aspects and regulatory review. American Family Physician, 58 (2), 415-426.

Appendix C: Routine Screening Tests for the Adult

1. Screen as per risk factors: PPD annually, HIV, Rapid Plasma Reagin test, and Gonorrhea and Chlamydia testing.

2. Total cholesterol: screen every five years, starting at 25 years.

3. Digital rectal exam: perform annually starting at age 50.

4. Prostrate-specific antigen: screen annually starting at age 40 for blacks and age 50 for others.

5. Fecal occult blood: screen for colon cancer annually, starting at age 50 years.

6. Sigmoidoscopy: perform every 5 years, starting at 50 years, to screen for colon cancer.

7. Testicles: examine every 3 years in 25-39 year olds and every year in those older than 40 years with history of cryptorchidism or atrophic testes. Self testicular exam should be taught and encouraged on a monthly basis.

8. Oral cavity: examine in those older that 60 years, tobacco users, and those who drink alcohol.

9. Hearing: screen clients with regular exposure to excessive noise; establish baseline at 40 years, repeat at 50 years. After 60 perform annually.

10. Blood glucose: baseline is at 18-39 years, then do every two years.

11. Mammography: obtain baseline at 35-40 years, then repeat every 1-2 years from 40-59 years, every year after 60 years.

12. Pelvic examination and Papinicolaou smear: every year until 60 years, then every one to two years.

13. Thyroid Function check starting at age 60, repeat every 3-5 years.

14 Review immunizations and update as needed. Recommend annual influenza vaccines as indicated.

Kidd, P. S., & Robinson, D. L. (1998). Family Nurse Practitioner Certification Review. Mosby: St. Louis.

Appendix D: Sample Occupational & Environmental History Form

Source: The Occupational and Environmental Health Committee of the American Lung Association of San Diego and Imperial Counties: Taking the Occupational History. In Nurse Practitioner Forum, Vol. 6, No. 2 (June), 1995: pp 64-71.

Table 2. Occupational/Environmental History Form

I. Identification
Name: Social Security:
Address: Sex:
Birthday:
Telephone: home/work

II. Occupational profile
Fill in the table below listing all jobs at which you have worked, including short-term, seasonal, and part-time employment. Start with your present job and go back to the first. Use additional paper if necessary.

Workplace	Dates worked From/To	Did you work full time	Type of industry (describe)	Describe your job duties	Known health hazards in workplace	Protective equipment used?	Were you ever off work for a health problem or injury?

III. Occupational exposure inventory
1. Please describe any health problems or injuries you have experienced connected with your present or past jobs:
2. Have any of your coworkers also experienced health problems or injuries connected with the same jobs? No Yes
If yes, please describe:
3. Do you smoke or have you ever smoked cigarettes, cigars, or pipes? No Yes
If so, which and how many per day?
4. Do you smoke while on the job, as a general rule? No Yes
5. Do you have any allergies or allergic conditions? No Yes
6. Have you ever worked with any substance that caused you to break out in a rash? No Yes
If so, please describe your reaction and name the substance:
7. Have you ever been off work for more than a day because of an illness or injury related to work? No Yes
If so, please describe:
8. Have you ever worked at a job that caused you trouble breathing, such as cough, shortness of wind, wheezing? No Yes
If so, please describe:
9. Have you ever changed jobs or work assignments because of any health problems or injuries? No Yes
If so, please describe:
10. Do you frequently experience pain or discomfort in your lower back or have you been under a doctor's care for back problems? No Yes
If so, please describe:
11. Have you ever worked at a job or hobby in which you came into contact with any of the following substances by breathing, touching, or direct exposure? If so, place a check beside the substance.

Acids	Carbontetrachloride	Ethylene dichloride	Mercury	Phenol	Toluene
Alcohols	Chlorinatednaphathalenes	Fiberglass	Methylenechloride	Phosgene	TDI or MDI
Alkalis	Chloroform	Halothane	Nickel	Radiation	Trichloroethylene
Ammonia	Chloroprene	Heat (severe)	Noise (loud)	Rock dust	Trinitrotoluene
Arsenic	Chromates	Isocyanates	PBBs	Silica powder	Vibration
Asbestos	Coal dust	Ketones	PCBs	Solvents	Vinyl chloride
Benzene	Cold (severe)	Lead	Perchloroethylene	Styrene	Welding fumes
Beryllium	Dichlorobenzene	Manganese	Pesticides	Talc	X-rays
Cadmium	Ethylene dibromide				

If you have answered yes to any of the above, please describe your exposure on a separate sheet of paper.

IV. Environmental history
1. Have you ever changed your residence or home because of a health problem? No Yes
If so, please describe:
2. Do you live next door to or very near an industrial plant? No Yes
If so, please describe:
3. Do you have a hobby or craft that you do at home? No Yes
If so, please describe:
4. Does your spouse or any other household member have contact with dusts or chemicals at work or during leisure activities? No Yes
If so, please describe:
5. Do you use pesticides around your home or garden? No Yes
If so, please describe:
6. Which of the following do you have in your home?
Air conditioner Air purifier Humidifier Gas stove Electric stove Fireplace Central heating

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Appendix E : Poem by Daniel Filey

In A Box

From inside a box, high above the ground on which I travel,
peering through a plate of glass.
I watch this world, my world, your world go by.

Ever vigilant to what is happening around me,
I have seen life anew itself
and death at what could be at its worst.

I have seen love and kindness that lightens ones heart
and makes life worth living.
I have seen hate that could blacken a soul and take that life away again.

Always moving at a rapid pace, never stopping
but for what seems to be a few moments in time.
The sun rises from the black, only to fall back again.

It leaves me alone in the cool night air,
with only the ever present humming from the beast beneath my feet
which aids me along my way, and the sound of the wind being forced
around me as I hurry along, the many paths that I have to follow.

The days pass like the miles that I cover, rapidly and unknowingly aging me
without a care to how long I have been here,
or how long I will be here.

The seasons pass like a few days in a week;
spring, summer, fall and winter.
One never seeming to last as long as it should.

There are many around me hurrying to their homes to be with family and friends,
never caring where I have been, where I am going,
what I have brought or what I have taken.

Some just want me to get it there and to move along.
To others I am in the way,
wasting their precious time.

If they only knew how precious that time at home with family and friends is,
and that we, the men and women in the boxes, are like the blood that
pumps through their veins, keeping them going and alive.

For without us, there would be hunger, death, and mass confusion
as all would come to a halt.
Perhaps then time would stand still long enough for me to take a breath.

Yes, I am a truck driver. Though mostly a thankless job,
I knowingly do what must be done from inside this box
for my survival as well as yours.

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IF YOU'VE GOT IT
A TRUCKER BROUGHT IT.

Appendix F: Correspondence from "Nurse Red"

October 9th, 1997

Hi Lisa,

Glad to see someone else in the medical world interested in the issue of trucking and health. My name is Sharon, and I am commonly known as Nurse Red here in cyber-world as well as at the clinic we operate for the trucking community.

If you visit Layover.com and click on the 'Trucker's Doc' page, you will see this month's health related article and you will find the archives for previous articles at the bottom of the page. Most of these issues were requested by the drivers. At Layover, there is also a section called Healthy Lifestyles which addresses diet, exercise, vitamins, etc.

About 3 years ago, I was working for a hospital based occupational health office. When the hospital downsized, my job disappeared. As I was on my way home that afternoon, I happened to pass the Truck (sic) stop near my home and a lightbulb went on over my head. It did not take me long to do my homework and find out that drivers were desperately in need of accessible, quality medical care. Dr. Briggs and I opened a full service medical clinic in the Hotel building of the truck stop, and the rest is history. That was 3 years ago, we were a staff of two with a two room clinic. We are now a staff of seven and have eight rooms, including x-ray.

There have been several articles written about the clinic in trucking publications which has allowed more drivers to find out about us.

In our clinic, we offer D.O.T. medical exams (which are required by law), substance abuse testing services (also required by law), as well as acute minor injury/illness management. Anyone walking in the door is offered a free blood pressure check which many take advantage of on a regular basis. We give them wallet cards and record the readings for them. We also offer flu vaccines in the fall which the drivers really appreciate.

We have handled impending strokes, stab wounds, sexually transmitted diseases, fractured extremities, even a spontaneous abortion in the hotel

elevator! The security crew at the truck stop has called the clinic asking for us to respond to emergencies in the parking area while awaiting rescue personnel. In the meantime, we also see and treat the everyday coughs, colds, and flu.

Drivers must meet federally mandated physical requirements prior to beginning life as a driver and every two years thereafter (more often if there is a health problem such as hypertension). There are certain conditions, such as insulin dependent diabetes and seizures which will disqualify a driver from his job.

Drivers are often overweight due to their diet of fast foods and fried foods found in most truck stop restaurants, as well as their lack of exercise. They sit and they drive most of the time. Very sedentary lifestyle for most.

The life of a driver is a very stressful occupation also. I can cite any number of contributing factors for the stress issue. But just read the posts on the roundtable and you will get a general idea of what they are up against in their daily lives.

I hope this info is helpful, and please don't hesitate to write with any other questions.

Keeping you safe, healthy, and on the road.

Nurse Red

Appendix G: Driver Fatigue Quiz

Office of Motor Carriers

Driver Fatigue Quiz

This is a quiz to determine how much people know about sleep and sleep debt.

1. Coffee overcomes the effects of drowsiness while driving. **(T or F)**

2. I can tell when I'm going to go to sleep. **(T or F)**

3. Rolling down my window or singing along with the radio will keep me awake. **(T or F)**

4. I'm a safe driver so it doesn't matter if I'm sleepy. **(T or F)**

5. You can stockpile sleep on the weekends. **(T or F)**

6. Most adults need at least seven hours of sleep each night. **(T or F)**

7. Being sleepy makes you misperceive things. **(T or F)**

8. Young people need less sleep. **(T or F)**

9. Wandering, disconnected thoughts are a warning sign of driver fatigue. **(T or F)**

10. Little green men in the middle of the road may mean the driver is too tired to drive. **(T or F)**

11. On a long trip, the driver should never take a break but try to arrive at the destination as quickly as possible. **(T or F)**

12. A microsleep lasts four or five seconds. **(T or F)**

Driver Fatigue Quiz -- Answers

1. **FALSE**. Stimulants are no substitute for sleep. Drinks containing caffeine, such as coffee or cola, can help you feel more alert' lout the effects last only for a short time.

2. FALSE. Sleep is not voluntary. If you're drowsy, you can fall asleep and never even know it. You cannot tell how long you've been asleep.

3. FALSE. An open window or the radio has no lasting effect on a persons ability to stay awake.

4. FALSE. The only safe driver is an alert driver. Even the safest drivers become confused and use poor judgement when they are sleepy.

5. FALSE. Sleep is not money. You can't save it up ahead of time and you can't borrow it. But, just as with money, you can go into debt.

6. TRUE. The average person needs seven or eight hours of sleep a night. If you go to bed late and wake up early to an alarm clock, you probably are building a sleep debt.

7. TRUE. One of the warning signs of a drowsy driver is misjudging surroundings.

8. FALSE. Young people need more sleep than adults. Males under 25 are at the greatest risk of falling asleep. Half of the victims of fatigue-related crashes are under 25.

9. TRUE. If you are driving and your thoughts begin to wander, it is time to pull over and take a break.

10. TRUE. Seeing things that are not there is a good indication it is time to stop driving and take a rest.

11. FALSE. Driving, especially for long distances, reveals a drivers true level of slrueiness. To be safe, drivers should take a break every three hours.

12. TRUE. During a "microsleep" of four or five seconds, a car can travel 100 yards, plenty of time to cause a serious crash.

Last updated September 11, 1998

Appendix H: Smoking Cessation Advice for the Trucker

1. Advise all smokers to stop. Any client in the office should be advised to stop if they are a current smoker. If client is unable to quit, provide motivating literature and ask again at next visit.

2. Assist client in quitting with nonpharmacological approaches:

   A. Help the client pick a "quit date" within the following four weeks

   B. Consider initiating a stop-smoking contract with the client

   C. Provide self-help materials

3. Consider having the client complete a smoking diary as a behavioral technique to help in identifying triggers and planning activities to overcome the urge to smoke when triggers occur. For the trucker, this may be talking on the CD radio, chewing gum, singing, or other such diversionary tactics.

4. If there are no cigarettes in the cab, the trucker is unable to smoke. Awareness of the urge to smoke or buy cigarettes at truck stops should be addressed. Individual plans to avoid the pitfalls of the truck stop should be devised. Exercise instead of sitting in the smoke filled trucker lobby may decrease urge.

5. To help client develop coping responses, recommend specific behavioral techniques (e.g., deep breathing and relaxation) and cognitive techniques (e.g., telling oneself that "smoking is not a viable option").

6. Clients who are not ready to quit should be provided with motivational literature.

Uphold, C. R., & Graham, M. V. (1998). Clinical Guidelines in Family Practice, (pp.90-91) Barmarrae Books: Gainesville.

Appendix I: Exercises to Recommend While in the Cab of the Truck

The following exercises can be performed while the vehicle is in motion as long as they do not interfere with the driver's control of the vehicle.

1. The shoulder shrug: rotate the shoulders forward and backward.
2. Lateral stretch: wrap one arm in front of the chest and clasp the fingers on top of the opposite shoulder.
3. Leg stretch: straighten the lower leg out and tighten the thigh.
4. Rotate ankles: to the right and then to the left.
5. Toe lift: lift toes toward the knee, then press toes down.
6. Arm grabber: grab top of steering wheel with both hands - push than pull [this should be performed with the vehicle stopped].

Adapted from: Chenowith, D., (1990). Truckers challenged to use clout to effect health-promotion changes. Occupational Health and Safety, 59(6), p. 46.

Appendix J: Stress Weapons by Dr. Briggs

STRESS WEAPONS

There are many valuable tools you can use to battle stress. You can pick or choose which ones you will use for any given situation. No one experiences or reacts to stress in the same manner with each situation. If we did, it would be a lot easier to know what to do each and every time. The tools identified below are related to the type of stress you are experiencing and the symptoms described earlier. The solutions can be used in any combination that works best for you. The important thing to remember is that they don't work if you don't use them!

Emotional:

1. Determine the source of the stress. Is it really job dissatisfaction you are experiencing or are you allowing an unhappy personal relationship affect the rest of your life. Knowing where the stress is originating from is a key factor. You may have to resort to some real soul searching to determine what is actually the root of the problem.

2. Make yourself aware of the things you say during stressful times. Does what you say reduce or increase the stress you feel? Do you explain to the dispatcher why the load he has lined up for you is unrealistic, or do you simply hang up and grumble to yourself and others about how stupid he is? You may feel better by calling him names, but you have done nothing to solve the problem so the stress remains and progresses.

3. Learn new response techniques. Pick one feeling or emotion and find a different way of responding to it. This takes time, practice and an effort on your part to stick with this plan. Responses are often habitual and old habits are hard to break. You may need to step back from a situation long enough to give yourself a 'mini pep talk'. Something like this may help- "O.K., dispatch has screwed up again. Calm down, take a deep breath, and think. What is the plan I have for dealing with this situation? Oh yeah, I remember...." Then put that plan into action. Even though you may not be able to fix the dispatch problem, you will reduce the stress you feel because you have chosen to think differently about the situation and react in a positive manner. As you learn to use this tool for one emotion, it will become easier for you to incorporate this tool for other situations. If you make an honest effort to stick with this way of thinking, it will eventually become second nature to you.

4. Avoid unrealistic thinking and expectations within yourself. When you use words like "must", "should", and "have to", you are setting up unnecessary pressure for yourself. "I'll try", "I'll do my best", etc. will allow you to do what you can with what you have and not feel like a failure if all does not go well. You will have the satisfaction of knowing you did the best you could and your self esteem will remain intact.

5. Talk to others. Family, friends, co-workers, and/or professional counselors. Explain the stressful situation and how you handled it. Ask for feedback on what you could have done differently and then LISTEN. Don't make it a gripe session, state the true facts and your feelings. Allow the person you are talking to respond without interruption, and think about their answer before you respond back. Don't automatically dismiss their advice or start shooting down their theory until you have really thought about what they have said. They may have some valid ideas that just need a little fine tuning on your part.

Physical:

1. Exercise. Find something you really like and do it as often as possible. Walking, park a little farther away than usual and walk to the restaurant instead of trying to find the closest space you can. Ride a bike, I've seen several drivers carry bicycles secured to the back of the cab. Work outs are now more available than ever as more truck stops provide weight-lifting and exercise areas for the drivers. Swimming, spend a few extra dollars when staying in motels and try to pick one that offers a pool. This form of exercise can be done easily even by the most out of shape person. Another benefit of exercise is the release of hormones called endorphins. It is the body's natural high that you experience after exercise.

2. Relaxation techniques are tools used by some for stress relief. Some examples are: yoga, mental imaging, self-hypnosis, and meditation. 3-5 minutes several times a day may be all it takes to boost your ability to handle stress appropriately.

3. Diet. Limiting your intake of caffeine, sugar, and alcohol and increasing your intake of vitamins and minerals are great for battling stress. Magnesium can decrease anxiety, brain overload, and confusion. B vitamins help prevent depression and irritability. They also help cells convert fats and carbohydrates into energy. Iron increases energy and concentration ability by carrying oxygen to brain tissues. The Antioxidants ,(E, C, and Beta-Carotene) strengthen the immune system of the body. Chocolate has the ability to cause production of the beta-endorphins in the brain which can make you feel better temporarily. A low-fat diet also boosts your immune system. A high-fat diet increases your vulnerability to infections and diseases. Some people respond to stress by eating. This may happen because the physical act of sucking, chewing, and sipping release soothing hormones to the brain. Stress also decreases nutrient absorption. So when you are stressed, your body may actually require more food than usual because it is not getting the full nutritional value of what you are eating.

Behavioral:

1. Time management is an important tool in the battle against stress. Make a list of daily activities. Be sure to schedule some relaxation time too (sic). Make your goals

Appendix K: Example of Upstream Thinking - Lobbying for Legislative Changes

September 26, 1998

George L. Reagle
Associate Administrator
Federal Highway Administration,
Office of Motor Carriers

Dear Mr. Reagle,

I am a registered nurse and a graduate student in the College of Nursing, Montana State University. I am currently conducting a review of health promotion activities to enhance the overall health and well-being of long-haul truck drivers. As you are responsible for the issuance, administration, and enforcement of the Federal Motor Carrier Safety Regulations, I am advocating for amending Part 391.41. This part of the regulations provides guidelines for the examining provider who will issue a Medical Examiner's Certificate. The professional who issues the Medical Examiner's Certificate, under the current guidelines, has a primary obligation to the public during the DOT physical so to insure public safety. This is in conflict to the usual role of revolving care around the patient as the primary responsibility. I propose that it be mandatory that *both* the public and the driver be the responsibility of the licensed provider during the DOT exam.

Research has demonstrated that the long-haul trucker is at increased risk for many preventable diseases or conditions. The DOT physical should include health promotion components that would serve to prevent many of the long-term effects of the trucking industry: such as orthopedic disorders, obesity, hypertension, poor hearing, diabetes, cancer, traffic accidents, etc. Health promotion would include risk factor focused education on such topics as nutrition, alcohol use, smoking cessation, the value of exercise, lifting safety, noise reduction, and the dangers of fatigue. An individualized plan to promote healthy lifestyles should be devised in a collaborative effort between the provider and the driver, with the provider offering professional advice and services as needed to achieve mutually agreed upon goals.

The licenced medical provider has a captive audience while conducting the required DOT physical, and should be mandated to provide services to help promote the health of our most valuable work force, the truck drivers of this country. Additionally, the driver deserves good care for his money, and health promotion should be part of that care. Mandating that the driver must receive both routine screening and health promotion education at each DOT exam will increase both the longevity and the well being of our driver population, as well as increase safety on the road for all of the public. I strongly encourage you to seek support to amend FMCSR Part 391.41 to include health promotion guidelines and mandate that they be incorporated into the DOT examination by the licensed provider. Thank you for your consideration of this most important topic.

Sincerely,

Lisa M. Wallis
Billings, Mt. 59101

Appendix L: Correspondence from "Nurse Red"

October 8th, 1997

Hi Lisa,

I do not know of any demographic info that has been compiled on truckers other than the data they are using to change the hours of service regulations and some of the Sleep deprivation data that used for that study. (sic)

As for promoting healthier truck stops, we were instrumental in convincing Country Pride Restaurants (which franchise in with all Truck stops of America) to start offering and identifying 'Heart Smart' selections on the menu and offering more baked and broiled foods as opposed to fried. Many truck stops are beginning to offer weight rooms and there is one fella out west who is starting a mobile workout unit in the mid-west somewhere. The problem there is that most people don't know how to workout properly without some guidance and run the risk of doing as much damage as good.

About a year ago, there was a massage therapy group that ran a massage parlor (legitimate) for the drivers and I thought it was doing rather well, but they closed up after a year. The drivers really seemed to like it and I am sure it was a great stress buster for them.Our clinic is privately owned and held by myself and Dr. Briggs. We are not affiliated with anyone. It has been successful enough for us to expand 3 times in 3 years.

We originally started out just doing physical exams and substance abuse testing in 2 rooms, (an office and an exam room). Within 6 months, we had added minor injury/illness care because we had so many drivers asking if the Doc could see and treat a variety of things. We added the supplies needed and then got our dispensing license because we found that driver's needed access to pharmacy services as well as medical care. We maintain and dispense a variety of non-narcotic medications and antibiotics that are most commonly prescribed so that they may begin treatment right away. The drivers have almost as much trouble getting to a pharmacy they can park at as they do finding a doctor.

We have found that drivers will have their family doc forward medical records to us when they have chronic medical problems so that we may work with their doctor to manage their care. They find that they get to our facility on a regular basis as opposed to trying to get home and then get an appointment with their doctor. All of this promotes the drivers well being as far as compliance issues. We have also found that drivers will seek out medical care much more quickly when it easily accessible.

Drivers have told us stories of being sick and pushing themselves until they were so ill that they needed emergency care for dehydration and such.

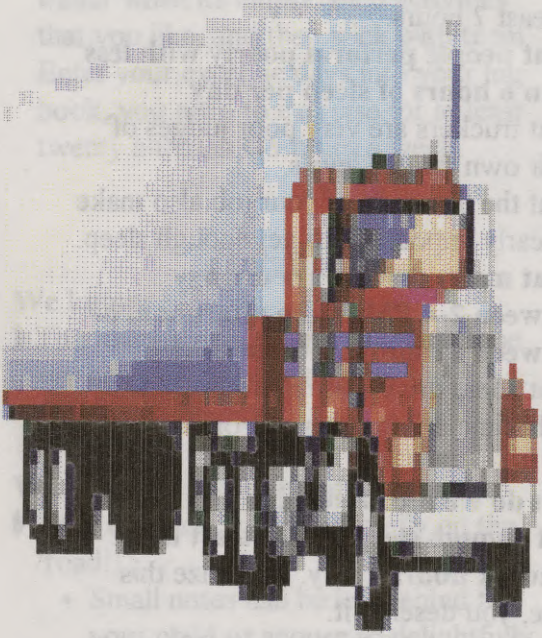
We have received e-mail asking us to discuss various health issues in our articles and we try to honor those requests either personally or by wrtitng an article addressing the issue. I am currently communicating with a former driver who has become HIV positive which he attributes to IV drug use of amphetamines in the past. He used the drugs to remain awake for days at a time so he could make more money. He tells me that this was a very common practice for trucker's and he is looking for others like him in an effort to start a support group of sorts. This type of practice is what initiated the substance abuse testing regulations we now have in place for tractor trailer drivers. It will be interesting to see what sort of response we get from others once this is publicized.Glad to hear from you again, keep those questions coming.

Keeping you safe, healthy, and on the road.

Nurse Red

Appendix M: Pamphlet "Guidelines for Long-Haul Health"

GUIDELINES



for

Long Haul Health



What do you need to worry about as a truck driver?

Sleep and Fatigue

We know:

- That truckers average less than 5 hours of sleep a day, but would like to sleep at least 7 hours.
- **That people perform poorly with less than 6 hours of sleep per day**.
- That truckers are very poor judges of their own fatigue levels.
- That the demands of your job also make it nearly impossible to get enough sleep.
- **That many drivers are drowsy between 2-4 PM in the afternoon, or between 12 midnight and 6 AM.**
- That some drivers are more hardy at night time driving than are others.

What do we recommend?

- **Get enough sleep! Or at least more than six hours a day**. Prioritize this time, you deserve it.
- Try to avoid driving at night. **If you do drive during the night, stop and sleep for at least two hours between 1 a.m. and 6 a.m.** You will feel much better if you get even a little sleep during this important time, and you will be a much safer driver.
- Avoid driving on multiple nights in a row. This increases your fatigue and your likeliness to nod off at the wheel.
- **Place a value on sleep**, it's as important for you as fuel is for your truck.
- **Take naps if you feel sleepy.**
- Get to know yourself. Are you someone that struggles with night time driving? Or someone that excels at staying awake through out the night? If you are even borderline, avoid night time driving.
- Ask your health care provider about fatigue, sleep-deprivation, and sleep disordered breathing. These three problems are all very common among truckers, and your health care professional may be able to help you.

Noise

We know:

- That trucks are noisy places to work which can contribute to hearing loss

What do we recommend?

- **Try to keep your noise exposures low.** Keep your windows rolled up, your stereo at a medium to low level, your fans and mufflers working optimally.

Cancer Risks

We know:

- That **truckers are at increased risk for colon cancer, lung cancer, bladder cancer, and multiple myelomas.**

What do we recommend?

- Try to eat more whole grains, fruits, vegetables.
- **Try to limit your exposure to diesel exhaust**.
- Smoking **cigarettes** increases your risk of many types of cancer. **You can quit smoking!** Ask your health care provider for advise.
- **Ask for routine health screening while at your DOT exams.** There are many routine exams that can detect early stages of diseases - when they are more likely to be successfully treated. These exams are completed according to age and risk factors. **If you do not receive a regular complete physical, more than likely these exams are not being done for you.**

Diet and Exercise

We know:

- That **most truckers do not exercise**.
- That **most truckers are overweight.**
- That most truckers eat irregularly and eat a lot of high fat foods.
- That exercise and good nutrition will decrease your risk of cancer, diabetes, cardiovascular disease, sleep disorders, and overall well being. **You will retire as a much healthier and happier trucker if you keep your weight down and exercise.**

What do we recommend?

- One of the most important things that you can do is to lobby the government, your company, and the rest areas where you frequently stop to provide you and your fellow truckers with

better facilities. **You are a powerful consumer!** You deserve healthy choices, such as an exercise area and better food choices.

- **Exercise!** Park at the far end of the lot. Walk for 20 minutes a day, try this before you hit the showers. Do jumping jacks, jog in place, exercise in your trailer when its empty. Find activities that you like, and then stick with them. Enter your exercise days into your log book, you need to exercise for at least twenty minutes 4-5 times a week.

Isolation

We know:

- That truckers spend many hours alone on the road, causing them to miss family and friends.

What do we recommend?

- Stay in touch with your family on the road!!
  - Small notes can be left behind for your child or spouse to delightfully discover throughout the week.
  - Hang a map of the United States so your family can track your truck's route.
  - Take a calender of special family events with on the road.
  - Call home as often as financially possible, or leave answering machine messages when it is known that no one is home.

Stress

We know:

- That trucking is frequently stressful.
- That stress is unhealthy and tiresome.

What do we recommend?

- Talk to others.
- Avoid unrealistic thinking and expectations within yourself.
- Make yourself aware of the things you say during stressful times. Does what you say reduce or increase the stress you feel?
- Exercise.
- Limit your intake of caffeine, sugar, and alcohol.
- Don't set yourself up for failure by scheduling more than you can accomplish.
- By leaving some open time, you are ready for the little snags that can stress an already overloaded schedule.
- Adopt the best friend you may ever know!! **A pet can help decrease your stress and increase your self-worth and happiness.** You will also get more exercise!

Developed by Lisa Wallis & Erik Faes
Montana State University
1999

