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Medical Review Process and License Disposition of Drivers Referred by Law Enforcement and Other Sources in Virginia

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INTRODUCTION

This year, 2011, the first of the Baby Boom generation begins to reach age 65. This 65-and-older age group, which numbered 35 million in the United States in 2000, will grow to more than 54 million by 2020, and will exceed 70 million by 2030. By 2030, nearly 1 in 5 drivers will be 65 or older (U.S. Census Bureau, 2004). As noted by Rosenbloom (2004), licensing is close to universal among those who will turn 65 in the next 15 years, with almost every U.S. man and more than 9 out of 10 U.S. women entering their retirement years as drivers. Along with the increase in the number of older licensed drivers will be increases in number of drivers with age-related medical conditions and functional declines that impair safe driving (Owsley, 2004; O'Neill & Dobbs, 2004). Also, although older people made up approximately 12% of the U.S. population in 2004, they accounted for 34% of all prescription medication use and 30% of all over-the-counter medication use (Merck Institute of Aging & Centers for Disease Control and Prevention, 2004). Approximately 64% of older adults in a large pharmaceutical database study sample received potentially driver-impairing medications (LeRoy & Morse, 2008).

The increasing number and percentage of medically and functionally impaired drivers in the U.S. will pose many challenges for traffic engineers and licensing agencies in the coming decades, even as independence and quality of life continue to depend overwhelmingly on the personal mobility afforded by automobiles. It is NHTSA's goal to keep older road users safely mobile through programs directed toward reducing traffic-related injuries and fatalities among older people.

Medically at-risk drivers come to the attention of licensing authorities through referrals from a variety of sources, including physicians, law enforcement, and the court system; in most jurisdictions referrals are also accepted from family, friends, and other concerned citizens. The mechanism to detect and intervene with functionally impaired drivers depends critically upon the success of outreach efforts to encourage referrals to the licensing authority, and upon having medical review processes in place within a State's Department of Motor Vehicles and/or through its Medical Advisory Board to conduct case reviews and reach determinations of medical fitness-to-drive that are valid, efficient, and perceived to be fair by the driving public. It will be important for these processes to be in place to accommodate the projected surge in the proportion of older licensed drivers in the coming years.

Few studies have documented the circumstances prompting referral of drivers to the DMV for medical review and the outcomes of such referrals. Soderstrom, Scottino, Joyce, Burch, Shiu, & Kerns (2009) studied the driving actions, medical concerns, and medical conditions for 486 drivers referred by law enforcement officers to the Maryland Motor Vehicle Administration Medical Advisory Board. The majority of the referred drivers (72.4%) were 60 or older. Confusion and disorientation concerns were more frequent among the older drivers referred, and loss of consciousness concerns were more frequent among the younger drivers referred. Seizures/epilepsy and diabetes were the most common medical conditions among the younger drivers and all mentions of dementia involved older drivers. Fewer drivers 60 and older were cited for their violations compared to drivers younger than 60 (33% versus 54%, respectively). Soderstrom et al. (2009) did not evaluate the license outcomes for these 486 drivers who underwent DMV medical review.

The Pennsylvania Department of Transportation (PennDOT) reported on the outcomes of referrals from physicians (PennDOT, 2010). In accordance with Section 1518(b) of the Pennsylvania Vehicle Code, all physicians and other people authorized to diagnose or treat disorders and disabilities must report to PennDOT any patient 15 or older who has been diagnosed as having a condition that could impair his or her ability to safely operate a motor vehicle. Over 27,000 new reports are submitted each year to PennDOT. Approximately 22% of these people have medical impairments significant enough to merit recall of their driving privileges. An additional 21% of reports result in restrictions placed on the individual's driving privilege. These reports also cross the age spectrum, with half involving drivers younger than 65.

NHTSA sponsored a project in 2007 to develop an intervention to increase law enforcement referrals of medically at-risk drivers in Virginia. NHTSA undertook a separate effort to evaluate the referral process with the cooperation of the Virginia DMV. In 2009, the population of Virginia was 7,882,590, with 12.2% represented by people 65 and older (Census Bureau, 2010). That same year, there were 5,501,878 licensed drivers, 769,399 (14%) of whom were older than 65. Of the 116,774 reported crashes occurring on Virginia's roadways in 2009, 12.3% involved drivers over 65. Drivers and passengers 66 and older accounted for 16.6% of the traffic fatalities (Virginia Highway Safety Office, 2010). As of October 2010, there were 5,564,888 licensed drivers, with 922,224 (16.7%) 65 and older. According to the Virginia Department for the Aging (2007), The population of Virginians 60 and over will grow to almost 25% by 2025 when there will be more than 2 million Virginians in this age group. The number of Virginians 85 and older will increase at a rate that is five times faster than the State's total population growth.

The Virginia DMV's Medical Review Program has been in place for more than 40 years. In accordance with VA Code § 46.2-322 and with guidance from the Medical Advisory Board, DMV is charged with the responsibility of ensuring that drivers are able to safely operate motor vehicles. Virginia DMV's Medical Review Program is comprised of a Medical Advisory Board and an in-house DMV Medical Review Department. The Medical Advisory Board, established in 1968, consists of seven licensed physicians who are currently practicing medicine in Virginia. The Governor appoints board members for 4-year terms. The functions of the board are to advise the DMV on medical criteria and vision standards for licensing; review and advise the DMV on individual cases (as requested by the Medical Review Department, or when a driver contests the medical review action); and to assist on legislative proposals. The board performs paper reviews on approximately 60 drivers each year. The DMV Medical Review Department currently consists of 10 nurses and 1 office manager (also a nurse) who order medical and vision reports and skills and knowledge testing, and evaluate medical fitness to drive for drivers referred into their department by physicians, law enforcement, the courts, concerned family members, and DMV staff. In 2008, 6,253 new cases were referred to Virginia DMV's Medical Review Department, and in 2009, this increased to 7,847 new cases referred. The Medical Review Department issued 24,865 orders in 2009 as follows.

- Official notice (physician's report is required/not periodic review cases): 6,220
- Order to test (knowledge or road): 1,599
- Periodic medical review: 12,390

- Discharge from mental institution/deemed by the institution as incompetent to drive: 1
- Unacceptable medical information from physician (order of suspension): 2,489
- Department for the Blind: 695
- CDL cancellation order: 91
- CDL waiver required for the first time: 85
- CDL waiver periodic review: 429
- CDL variance required: 43
- CDL variance/waiver: 13
- Court-ordered incompetent to operate: 797
- Ineligible to test again (following multiple road test failures): 13

This report describes the medical review process and license outcomes for 100 drivers referred by law enforcement officers in Virginia. Additionally, it describes the license outcomes for 105 drivers referred by seven other sources: the courts for people adjudicated as mentally incapacitated, general traffic court, customers who self-report medical conditions on license application and renewal forms, DMV customer service representatives, the Department for the Blind and Vision Impaired (DBVI), family members, and physicians.

DMV MEDICAL REVIEW PROCESS

In Virginia, when a law enforcement officer encounters a driver during a traffic stop or at a crash scene who is suspected of having a medical condition or functional impairment that may affect the person's safe driving ability, the officer completes a Medical Review Request Form (referred to by the Virginia DMV as a "MED 3" form) and submits it to Medical Review Services at the Department of Motor Vehicles. This same form is used by physicians, family members, the courts, DMV representatives, and anyone else who has concerns about a driver's ability to operate a motor vehicle safely. The MED 3 form is shown in Appendix A. The form provides instructions to "describe in detail the circumstances that led to the request," and "to provide as much information as possible including a description of what appears to be the driver's mental, physical or visual impairment."

Upon receipt of the Medical Review Request form, the Medical Review Department mails a notice to the driver stating that he or she must undergo an examination by his/her physician, and have the physician complete a medical report (included in the mailing with the notice) within 30 days of the date on the letter. Often, a vision report completed by an eyecare specialist (optometrist or ophthalmologist) is also required. Failure to comply with this official order results in an immediate license suspension on the 30th day following the official notice. There are occasions where an individual is unable to obtain an appointment with their physician within the 30-day period. In this case, if the driver contacts the Medical Review Department, a time extension of 15 to 30 days may be granted by a medical evaluator (a nurse working in the Medical Review Department), based on the information contained in the narrative of the Medical Review Request. Extensions are granted only for cases where a Department medical evaluator determines that the risk of continued driving is minimal (e.g., the referral narrative does not indicate the presence of a blackout, seizures, or dementia). A Customer Medical Report is shown in Appendix B.

When a medical report is completed and returned to the Medical Review Unit, the DMV order in the database is coded as "satisfied" to ensure that the computer system does not generate an automatic license suspension 30 days from the date the medical report order was initiated. The driver is permitted to continue driving until a medical evaluator in the Medical Review Department reviews the medical report (within 48 hours of receipt of the report). The Medical Review Department currently consists of 10 nurses and 1 office manager (also a nurse).

The DMV is concerned with a driver's level of consciousness, mobility, judgment, and visual perception, as well as any adverse effects that certain medications may have on his or her ability to operate a motor vehicle safely. Based on the information provided by the physician, the medical evaluators may suspend the license (for specific medical conditions such as seizures); order more testing (DMV knowledge testing and/or road testing, or evaluation by a driving rehabilitation specialist); add license restrictions; place the driver on periodic medical review; or allow the driver to retain driving privileges without any further requirements. If a physician submits an "unacceptable report" (e.g., the report substantiates a seizure), the DMV will suspend driving privileges for 6 months from the incident date, at which time a driver must submit an "acceptable report" from the physician indicating that he or she has been seizure free for 6 months, to have driving privileges reinstated. Drivers with certain medical conditions are

placed on periodic review. Periodic review periods are set for 3 months, 6 months, 1 year, or 2 years. A driver newly diagnosed with diabetes may be placed on a 3-month review cycle, with the requirement to submit copies of blood sugar logs for 15 consecutive days, plus the results of a recent hemoglobin A1C. The logs and A1C must be taken after the 2nd month. The hemoglobin A1C provides a picture of an individual's average blood glucose control for the past 2 to 3 months. Other medical conditions that require periodic review include: visual disorders (e.g., glaucoma, cataracts), substance abuse, pulmonary disorders, psychiatric disorders (e.g., bipolar), musculoskeletal disorders, cardiovascular disorders, and neurological disorders such as seizures/epilepsy, traumatic brain injury, cerebral vascular accidents, dementia, Alzheimer's disease, paralysis/spinal cord injuries, vasovagal syncope, and multiple sclerosis.

Additional testing may be ordered based on recommendations made by the referring law enforcement officer or the physician, as both the Medical Review Request form and the Customer Medical Report have checkboxes to indicate whether, in the officer's or physician's opinion, the driver should have a vision exam, knowledge exam, road skills test, and/or an evaluation with a certified driver rehabilitation specialist (CDRS). The evaluators will order additional testing only for drivers who have submitted an "acceptable" medical report, as those with "unacceptable" reports are automatically suspended. Drivers who must comply with orders for knowledge and/or road testing must pass the tests within 15 to 30 days of receipt of their notice of the requirement, or their driving privileges are suspended. If the physician indicates that a driver evaluation with a CDRS is needed to determine fitness to drive, the DMV will suspend driving privileges, order the driver to enroll in a driving rehabilitation program and have the program specialist fax confirmation of enrollment to the DMV, and issue a restricted license that allows for driving only under the supervision of the driving evaluator following receipt of the confirmation of enrollment. If the driver successfully passes the driver evaluation, he or she may be required to also successfully pass the DMV knowledge and/or road tests to reinstate driving privileges. If the results of the driver evaluation are not favorable for continued safe driving, the DMV will suspend driving privileges. If the driver chooses not to participate in the driving evaluation, the DMV requires that he or she surrender the driver's license immediately.

DATA COLLECTION METHODS

Selection of Cases

Law Enforcement

TransAnalytics (the project contractor) selected 100 medical review cases¹ from among the 1,107 drivers referred by local law enforcement (LLE) officers and State police officers between December 1, 2007, and May 31, 2008. The Virginia DMV prepared a list of drivers referred by LLEs and a list of drivers referred by State police, sorted in chronological order by date of entry into their system. Since multiple drivers are referred on any particular date, the list was sorted chronologically by driver license number within the date entered. TransAnalytics selected every 11th driver from each list, for a total of 100 cases. This stratified random sample selection methodology preserved the percentage of drivers referred by the two law enforcement

¹ This sample size was the maximum determined to be feasible given project resources and schedule; it is unknown if these cases are statistically representative of all cases referred to the Virginia DOT for medical review.

types, and preserved the percentages of drivers referred within each month, in the event that seasonal variables affected who was on the road, and who was referred.

A TransAnalytics researcher working on site at the VA DMV in Richmond collected case study data that describe the drivers, the referral reasons, DMV test requirements, and license outcomes for the 100 law enforcement officer referrals. We collected data several months following the last referral in the case study sample to allow sufficient time for the DMV to make case dispositions.

Other Sources

The contractor collected data describing drivers referred by seven other sources. The DMV provided TransAnalytics with lists of driver license numbers for drivers referred between October 1, 2009, and January 31, 2010, from each of the following referral sources: the courts for people adjudicated as mentally incapacitated, general traffic court, customers themselves during license renewal or initial licensure, DMV representatives, the DBVI, family members, and physicians. The goal was to randomly select 15 cases from each of the 7 referral source lists to obtain the sample of 105. During the referral period of interest, the courts referred 330 people judged as mentally incapacitated (regardless of their license status); we selected every 22nd record for inclusion in the study. The district traffic courts referred 25 drivers; we selected every other driver record for inclusion. A total of 574 customers self-reported medical conditions when they renewed or applied for their initial license (see Appendix C); we selected every 38th record for inclusion in the study. DMV representatives referred 700 customers; we selected every 46th record for inclusion in the study. The DBVI reports all people 14 and older to the DMV when they apply for DBVI services, whether or not they drive or hold a license. During the reporting period of interest, DBVI referred 319 people; we selected every 21st record for inclusion in the study. Family members referred 76 drivers; we selected every 5th record. Physicians referred 117 drivers; we selected every 6th record. This group of 105 drivers is referred to collectively in this report as the “Other-Referred” drivers.

Data Extraction

TransAnalytics developed an Excel spreadsheet to enter the data, which were manually extracted from two Virginia DMV data systems: the Citizens Services System (CSS) and the OnBase System. The CSS system is maintained by the Virginia Information Technologies Agency Commonwealth Network. This database contains multiple screens of information about drivers in Virginia such as driving status, restrictions, renewal dates, medical orders issued (requirements for testing and whether and when they were met, periodic review requirements, and suspensions), and events (referral source and date of referral, crashes, and citations). The CSS database provides a brief overview of a driver’s status and history, but is not descriptive.

The second system, OnBase, contains scanned documents that make up each customer’s medical file. It contains medical review requests; law enforcement crash reports; medical reports from physicians, vision reports from eyecare specialists; correspondence sent out by the DMV to a driver describing the re-evaluation requirements, as well as copies of orders and notices; DMV nurse evaluator’s notes; lab work results, and DMV road test score sheets in some cases.

RESULTS OF MEDICAL REVIEW PROCESS FOR LAW ENFORCEMENT-REFERRED DRIVERS

Driver Age and Sex

Referred drivers ranged in age from 17 to 94 (mean = 62.9, s.d. = 20.0). Males comprised 49% of the sample and females 51%. Table 1 presents the percentage of cases within each 10-year age group, as well as the percentage of licensed drivers in Virginia in each age group (FHWA, 2008). The age groups with the highest percentages of drivers referred by law enforcement in this 100-subject sample are the 70-79 group (23% of the sample) and the 80+ group (24% of the sample). These two age groups account for the smallest percentages of the population of Virginia licensed drivers (6% and 3%, respectively). Beginning at 60, older drivers are overrepresented in this sample relative to their percentages in the driving population, while drivers 50 and under are underrepresented in this sample with respect to their percentages in the driving population. This is not an unexpected finding, given that the number of people with age-related medical conditions and functional declines that impair safe driving increases with increasing age.

How Drivers Came to the Attention of Law Enforcement

Of the 100 drivers referred, 64 came to the attention of law enforcement because they were crash-involved, and 30 as a result of traffic stops (the officer observed a violation or other driver error). The nature of the violation or driver error was recorded in 29 of the 30 police narratives. The most prevalent were driving the wrong way (e.g., northbound in the southbound lanes) and failure to maintain lane or weaving across lane lines. The driver errors (and frequency of occurrence) leading to the traffic stops are shown in Table 2, along with information about the drivers' ages. The remaining six drivers came to the attention of law enforcement as they assisted drivers parked along the road side or pedestrians walking to their vehicles.

Table 1. Percentage of Drivers in 10-Year Age Groupings Included in Law-Enforcement- Referred Sample, and Percentage of Licensed Drivers by Age Group in Virginia.

Driver Age Group	Percent of Drivers in Sample	Percent of VA Licensed Drivers*
<20	2%	4%
20-29	6%	17%
30-39	7%	18%
40-49	11%	21%
50-59	11%	19%
60-69	16%	12%
70-79	23%	6%
80+	24%	3%

Data from FHWA (2008). *Highway Statistics*.

Table 2. Driver Errors Leading to Traffic Stops.

Driver Error or Violation	Number of Drivers	Age Information
Driving the wrong way	10	Range 53-94, Mean 75.5 (s.d. 11.9) Less than age 65 = 1; age 65+ = 9
Failure to maintain lane/weaving	9	Range 47-92, Mean 69.2 (s.d. 16.5) Less than age 65 = 4; age 65+ = 5
Vehicle left roadway	2	Ages 51 and 71
Ran red light	2	Ages 26 and 82
Disregard law enforcement hand signal	1	Age 90
Failure to obey traffic lane markings	1	Age 82
Drove vehicle onto median	1	Age 24
Speeding	1	Age 47
Stopping (in intersection) for no reason	1	Age 50
Road rage	1	Age 21
Total	29	

Reasons for Referral

As previously noted, the instructions on the Medical Referral Form (MED 3) ask the requester to “describe in detail the circumstances that led to the request,” and “provide as much information as possible including a description of what appears to be the driver's mental, physical or visual impairment.”

Officers include their observations of drivers’ physical and mental status when completing the form, and also include any additional information provided by the drivers during these traffic stops (e.g., self-reported medical conditions and medications). Medical or functional reasons for requesting a DMV medical review were provided by law enforcement for 74 of the 100 drivers and are listed in Table 3. This list is mutually exclusive; if officers provided multiple functional or medical reasons, the research team selected the condition that was most severe, based on the research team’s understanding of the literature associating medical/functional impairments with crash risk. For example, if an officer wrote that the driver’s reaction time was slow and he also had a hearing impairment, we selected slow reaction time for the list. The circumstances leading to the referral of the other 26 drivers are explained below.

There were 16 other drivers for whom no medical condition or observation of mental, physical, or visual ability was provided indicating the need for a medical review. One may hypothesize that the nature of the traffic stop combined with a driver’s age triggered the referral. For example, 9 of the 10 drivers who were driving the wrong way had no other reason listed for the referral, but driving the wrong way is a red flag that a driver may be medically at risk. The ages of the 9 drivers were 53, 65, 68, 76, 78, 81, 84, 87, and 94. The driver who disregarded a law enforcement hand signal was 90. One of the two drivers who ran red lights was an older driver (82). Five of the 9 drivers stopped for failure to maintain their lane, but had no other circumstances for the referral were 54, 79, 79, 80, and 92.

The remaining 10 referral narratives described crash and violation circumstances, but did not include any description of the driver’s medical or functional status as a rationale for the

referral. The crashes and violations were not the red-flag type that might identify a medically at-risk driver. Examples are hitting the (opening) door of a vehicle legally parked on the side of the roadway, hitting a curb following a wide right turn and then impacting a fire hydrant, three run-off-the road crashes (one where a driver was distracted looking at scenery), failure to safely negotiate a curve due to inappropriate speed choice, a road rage incident, and rear-ending a stopped vehicle. One narrative indicated that the driver (age 70) was involved in a two-vehicle crash and on her court date, the presiding judge ordered a medical review; this referral was coded in the DMV database as a law enforcement referral and in fact was submitted by a law enforcement officer. Technically, however, it is a traffic-court ordered referral. The ages of the 10 drivers ranged from 21 to 87 (mean age = 63.4, s.d. = 18.4). Seven of the 10 were 65 or older. Age alone may have been a trigger for these referrals. It is also possible that officers observed signs of impairment for these 10 drivers, but did not provide them on the Medical Review Form.

Table 3. Law Enforcement Observations of Physical, Mental, or Visual Impairment, or Driver-Reported Medical Conditions Leading to Law Enforcement Officer Referral for Medical Review.

Reason Provided by Law Enforcement for Referral	Number of Drivers	Age Information
Loss of consciousness/blackout/seizure	21	Range 18-91, Mean 41.9 (s.d. 10). Less than age 65 = 18; age 65+ = 3
Driver had physical impairments (difficulty standing or walking, problems with motor skills or coordination)	12	Range 48-89, Mean 65.2 (s.d. 14.0) Less than age 65 = 6; age 65+ = 6
Driver unaware of being crash involved	7	Range 31 - 89, Mean 71.6 (s.d. 21.2) Less than age 65 = 1; age 65+ = 6
Driver was disoriented, confused, or mentally unstable	7	Range 50-85, Mean 66.0 (s.d. 14.0) Less than age 65 = 3; age 65+ = 4
Diabetes/low blood sugar	6	Range 34-82, Mean 58.5 (s.d. 16.9) Less than age 65 = 4; age 65+ = 2
Driver fell asleep behind the wheel	5	Range 44-79, Mean 57.8 (s.d. 14.4) Less than age 65 = 3; age 65+ = 2
Problems with vision	4	Ages 17, 39, 70, 81
Alzheimer's Disease or other dementia	3	Ages 64, 70, 78
Driver was lost near home in a familiar area	2	Ages 82 and 85
Driver confused the accelerator for the brake	2	Ages 67, 83,
Driver reported taking medications	2	Ages 63 and 61
Slow reaction time	1	Age 83
Heart trouble	1	Age 81
Driver was distracted (second crash with this factor)	1	Age 74
Total	74	

Referral Processes and Outcomes

Figure 1 describes the DMV-ordered requirements for the 100 drivers in this sample, including where in the process subsets of drivers chose not to comply (resulting in license suspension), and where others complied but failed to meet medical, functional, or skill requirements for continuing licensure (resulting in license suspension). It also shows license

disposition (e.g., no restrictions, restrictions, periodic review) following medical review and any additional DMV-required testing.

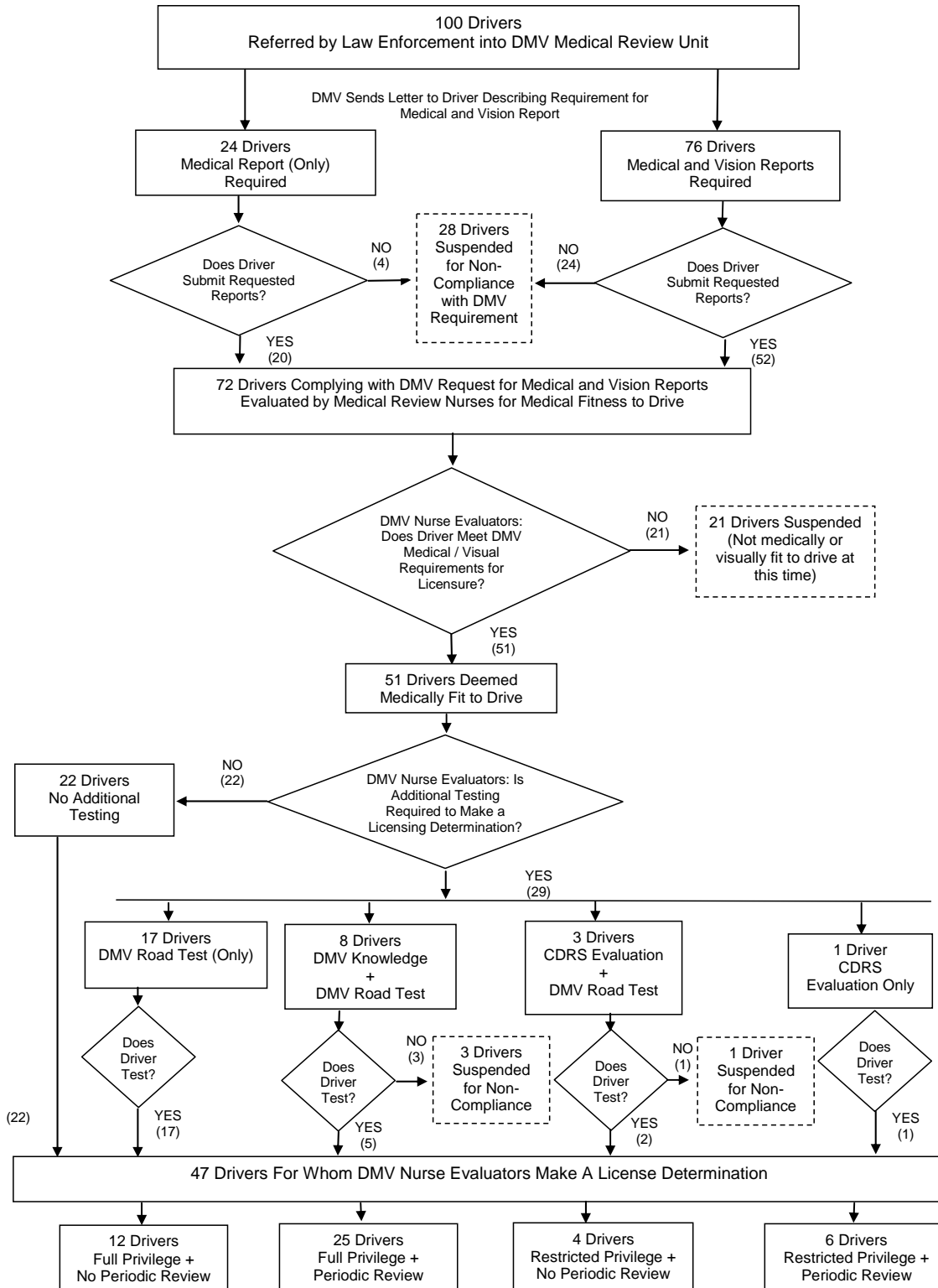


Figure 1. Medical Review Process and Outcomes for 100 Drivers Referred for Medical Review by Law Enforcement.

Drivers Who Failed to Comply With DMV Requirement to Submit Medical and Vision Reports

Twenty-four drivers were ordered to submit medical reports only and 76 drivers were each ordered to submit both a medical report and a vision report. Four of the 24 drivers ordered to submit only a medical report failed to comply with the order. Of the 76 drivers ordered to submit a medical and vision report, 19 drivers failed to submit both reports, 3 submitted only the vision report, and 2 submitted only the medical report. The 28 drivers who failed to comply with the DMV's requirements to submit reports received notices of license suspension 30 days following the letters advising them of the requirement.

The 28 drivers who failed to comply with the requirement to submit medical and vision reports ranged from 21 to 94 (mean age = 62.8, s.d. = 21.6, median = 64.5). There were 14 drivers younger than 65 (10 females and 4 males), and 14 drivers 65 or older (6 females and 8 males). The police narratives contained language indicating 19 of the 28 drivers were medically or functionally at-risk, as follows:

- Blackout/seizure/loss of consciousness: 7 drivers (ages 26, 27, 31, 59, 65, 72, and 91)
- Alzheimer's Disease/dementia: 2 drivers (ages 64 and 78)
- Disoriented/confused/mentally unstable: 1 driver (age 64)
- Lost: 1 driver (age 82)
- Unaware of being crash-involved: 2 drivers (ages 51 and 89)
- Slow reaction time: 1 driver (age 83)
- Fell asleep: 3 drivers (ages 44, 49, and 51)
- Diabetes: 1 driver (age 34)
- Physical condition: 1 driver (age 48)

The ages of the 9 drivers for whom law enforcement officers omitted driver condition descriptions were: 21, 47, 68, 72, 74, 76, 79, 92, and 94.

The sample of 100 drivers referred by law enforcement who continued in the medical review process was reduced to 72, following the elimination of the 28 drivers who did not submit the required medical or visual reports to the Medical Review Department.

Drivers With Unacceptable Medical or Vision Reports

Twenty-one of the 74 drivers who complied with the requirement to submit medical reports had their licenses suspended because they did not meet the DMV medical or visual requirements for safe operation of a motor vehicle. These drivers consisted of 12 males and 9 females ranging 18 to 89 (mean age = 53.8, s.d. = 21.6, median = 52).

For 7 of the 21 drivers, physicians indicated on the DMV-provided medical form that an evaluation by a CDRS was needed to determine fitness to drive. The licenses of these 7 drivers (ages 65, 70, 72, 75, 79, 80, and 89) were suspended pending the results of the driver evaluation. At the time case study data were extracted, 6 of these drivers had not made an appointment with a driver rehabilitation specialist and remained suspended for unacceptable medical reports. One

driver underwent driver rehabilitation, and was suspended following the driver rehabilitation specialist's recommendation that he retire from driving.

The Virginia DMV uses disability codes that generally describe the type of medical disorder underlying a periodic review requirement, but only for drivers who must submit medical reports on 3-, 6-, 12-, or 24-month bases. Following extraction of data for this study, DMV nurse medical evaluators assigned a disability code to all drivers in the sample who submitted medical reports, so that a general summary of the medical conditions for the case study subjects could be provided without discussing specific diagnoses. Only one disability code was assigned, even if a driver had several potentially impairing conditions; medical evaluators chose the one they felt represented the largest concern for safety.

The disability codes assigned by the medical review nurses for the 21 drivers with "unacceptable" medical or vision reports indicated the following medical conditions:

- Seizures or epilepsy (9 drivers);
- Cardiovascular disorders (3 drivers);
- Psychiatric disorders (2 drivers);
- Musculoskeletal disorders (2 drivers);
- Metabolic disorders (1 driver);
- Pulmonary disorder (1 driver);
- Vision disorder (1 driver); and
- Other neurological condition (2 drivers).

Additional Testing and Evaluation Requirements

There were 51 drivers who the DMV nurse evaluators deemed medically fit to drive, following their review of the medical and vision reports submitted by these drivers (i.e., the medical reports were "acceptable"). Table 4 presents the disability codes assigned to the 51 drivers. It is important to note that drivers may have had multiple medical conditions; the presentation of disability codes in this report as a facsimile for diagnosis is an oversimplification of the medical/functional status of the drivers. Even a single medical condition can result in multiple functional disorders. For example, diabetes is coded as a metabolic disorder, but it can cause peripheral neuropathy (nerve damage resulting in loss of sensation, especially in the hands and feet) and diabetic retinopathy (a visual disorder). The nurse evaluators considered all diagnoses and physicians' recommendations in their determinations of medical fitness to drive and in ordering additional testing.

DMV nurse evaluators may order additional testing, based on the information provided by law enforcement officers on the MED3 form, and the information provided by physicians and vision specialists. Drivers who do not comply with the testing requirements have their licenses suspended 30 days following the notices sent to them advising them of the additional test requirements.

No Additional Testing. There were 22 drivers for whom no additional testing was needed to make license determinations. They ranged in age from 24 to 85 (mean = 61.4, s.d. =

16.8). These drivers had the following medical conditions: visual (4 drivers); psychiatric (4 drivers); musculoskeletal (1 driver); metabolic (6 drivers); cardiovascular (4 drivers); seizures/epilepsy (2 drivers); and “other” neurological (1 driver). All 22 drivers were licensed without restrictions, but 15 of the 22 were placed on periodic review, with 2 drivers required to submit reports in 3 months, 3 drivers in 6 months, 9 drivers in 1 year, and 1 driver in 2 years. Two of the 22 drivers had come to the attention of the Medical Review Department on an earlier occasion (one with a psychiatric disorder and one with a metabolic disorder).

Table 4. Disability Codes and Number of Case Subjects With Each.

Disability Code	Description	Number of Subjects Deemed Medically Fit to Drive (n=51)
1	Neurological – Seizures/Epilepsy	2
2	Neurological – Traumatic Brain Injury	0
3	Neurological – Cerebral Vascular Accident (stroke)	1
4	Neurological – Dementia	0
5	Neurological – Alzheimer’s	0
6	Neurological – Paralysis/Spinal Cord	0
7	Neurological – Multiple Sclerosis	0
8	Neurological – Other Condition	7
9	Cardiovascular Disorder (e.g., ventricular tachycardia, sinus bradycardia, hypertension, congestive heart failure, coronary artery disease)	8
10	Metabolic Disorder (generally diabetes)	10
11	Musculoskeletal (e.g., osteoporosis, scoliosis, cerebral palsy)	3
12	Psychiatric (e.g., bipolar, anxiety, depression, post traumatic stress disorder)	6
13	Pulmonary (e.g., chronic obstructive pulmonary disease/COPD, emphysema)	1
14	Substance Abuse	0
15	Vision (e.g., cataracts, glaucoma, macular degeneration, constricted visual fields)	13

Road Test Only. Seventeen drivers were ordered to take only the DMV road test, and all 17 drivers complied with the order to test. They ranged in age from 17 to 89 (mean = 65.9, s.d. =18.3). Eleven of the 17 were 65 or older. Their medical conditions were: visual (7 drivers); pulmonary (1 driver); musculoskeletal (2 drivers); metabolic (3 drivers); cardiovascular (2 drivers); psychiatric (1 driver); and “other neurological” (1 driver). Twelve of the 17 drivers were licensed without restriction. Of the 5 drivers licensed with restrictions, 3 had new restrictions placed on their licenses (e.g., daytime only, no interstate, no highways with speeds greater than 45 mph, 10-mile radius of home), while 2 were already restricted to vehicles with adapted equipment (hand controls and spinner knobs). Ten of the 17 drivers were placed on periodic review, requiring medical or vision reports every 3, 6, or 9 months. One of the 17 drivers had come to the attention of the medical review department on a prior occasion (metabolic disorder).

DMV Knowledge and Road Tests. Eight drivers were ordered to take both the DMV knowledge test and the DMV road test. All 8 drivers were new referrals into the Medical Review Department. They ranged in age from 53 to 90 (mean = 76.3, s.d. =11.6). Their disability types were: visual (2 drivers); cardiovascular (2 drivers); metabolic (1 driver);

psychiatric (1 driver); and epilepsy/seizure (2 drivers). Three of these drivers (age 71, 73, and 90) failed to comply (2 did not take either test, and 1 took only the knowledge test), and their licenses were suspended. Of the 5 who complied with the testing requirements, 3 received unrestricted licenses, and 2 restricted licenses. One of the restricted drivers already had restrictions (10-mile radius and no interstates). The newly restricted driver was restricted to driving within 25 miles of home. All 5 drivers were placed on periodic review.

CDRS Evaluation Plus DMV Road Test. Three drivers were ordered to undergo evaluation by a CDRS and to pass the DMV road test before being allowed to retain driving privileges. All 3 drivers were new referrals into the Medical Review Department. They were 83, 84, and 85 years old. Two were coded with “neurological-other” conditions, and 1 with a cerebral vascular accident (a stroke). The 85-year old did not comply with the testing requirements and was issued a license suspension. The 2 drivers who complied with the DMV orders for testing were issued new restrictions on their licenses (both drivers were restricted to daylight only, no interstates, and driving within a 10-mile radius of home). One of the two drivers was put on periodic review, requiring medical or visual reports to the DMV in 3 months.

CDRS Evaluation Only. One driver was required only to undergo evaluation by a CDRS. This driver was 87 years old with a disability code of “other neurological condition.” This driver received a new license restriction (restricted to driving within a 10-mile radius of home) and was not placed on periodic review. This driver had not been previously referred to the Medical Review Department.

Licensing Outcomes

Of the 47 drivers who complied with all DMV medical review requirements, 12 were licensed with full driving privileges and no periodic review. These drivers ranged in age from 17 to 85 (mean = 56.8, s.d. = 30.3). Four had visual disorders, 2 metabolic disorders, 5 cardiovascular disorders, and 1 “other neurological” disorder.

Twenty-five drivers were also licensed with full privileges, but were required to undergo periodic review. They ranged in age from 31 to 89 (mean = 62.6, s.d. = 14.8). Five had vision disorders, 5 had psychiatric disorders, 1 a musculoskeletal disorder, 7 had metabolic disorders, 2 had cardiovascular disorders, 3 had “other neurological disorders,” and 2 had seizure disorders.

Four drivers were licensed with restricted privileges, but no periodic review requirement. They were ages 47, 81, 84, and 87. One had a vision disorder, one a musculoskeletal disorder, and 2 “other neurological disorders.” Three of the 4 received new restrictions on their licenses as a consequence of the medical review process. One received a “daylight only” restriction. One received a “10-mile radius” restriction. The third received a combination of restrictions: daytime, 10-mile radius, and no interstate. The fourth driver was already restricted to driving a vehicle equipped with a steering knob and no interstate driving.

Six drivers were licensed with restricted privileges, and a periodic review requirement. They ranged in age from 63 to 89 (mean 79, s.d. = 10.3). Two had vision disorders, 1 a pulmonary disorder, 1 a musculoskeletal disorder, 1 a cardiovascular disorder, and 1 a cerebral

vascular accident. Two were previously restricted (1 for hand controls and the other to a vehicle equipped with automatic transmission, power brakes and steering, along with no interstate driving and driving only within a 10-mile radius of home). The other 4 drivers were all restricted to driving close to home (3 within 10 miles and 1 within 25 miles), and 2 of these were also restricted to daytime and no interstates (with one also restricted to roads with 45 mph speeds or slower).

Table 5 summarizes the outcomes of the Medical Review Process for the entire sample of 100 drivers referred to the Virginia DMV Medical Review Department, by law enforcement officers following a traffic stop or in response to a crash.

Table 5. Licensing Outcomes Following Medical Review.

License Outcome following Medical Review	Number of Cases
Full Privilege and No Periodic Review	12
Full Privilege and Periodic Review	25
Restricted Privilege and No Periodic Review	4
Restricted Privilege and Periodic Review	6
Suspension for Unacceptable Medical Report	21
Suspension for Failure to Comply with Medical Review Orders	32

Summary and Recommendations

Of the 100 drivers referred by law enforcement, 28 were suspended immediately for failure to comply with the requirement to submit medical (and for some, vision) reports. Not only did these drivers fail to submit the required information within the 30-day period, they failed to do so by the time the case study data were extracted for this project (from 5 to 10 months following their order to submit these reports). Another 4 drivers submitted the required medical information, but received license suspensions for failure to take other DMV-ordered tests (knowledge, skills, or CDRS evaluation). One might hypothesize that these drivers knew they would not pass the medical requirements or the skill requirements for continued licensure, and therefore chose to allow their licenses to be suspended. If this is the case, then these 32 referrals may be considered “quality” referrals, in that the contact by law enforcement, and time spent by the DMV to issue orders and letters notifying drivers of these orders, led to a licensing action (suspension, for these 32 cases).² By choosing not to comply with the medical review requirements, these drivers gave up their privilege to drive.

An additional 21 drivers had their licenses suspended because their medical or vision reports indicated that they were not medically fit to drive. These 21 referrals may also be considered “quality” referrals in that the time and costs associated with the medical review process led to a licensing action (suspension).

² Quality referrals in this report are defined as referrals that result in a license action—either suspension, restriction, or periodic medical or vision reporting.

Had law enforcement not referred these 53 drivers (32 who opted out of the medical review process plus 21 medically unfit to drive), the Virginia DMV would be unaware that these drivers were medically at-risk. This would have resulted in their continuing operation of a motor vehicle among the licensed driver population on the State's roadways (assuming they are not currently operating with suspended licenses).

Of the 47 remaining referrals, 35 resulted in licensing actions in the form of driving restrictions or requirements to submit periodic medical reports. These 35 referrals may also be considered "quality" referrals, because the time spent by the drivers, physicians, DMV nurse evaluators, and other DMV licensing staff and independent driving evaluators resulted in fitness to drive assessments leading to licensing actions and/or continuing medical review.

Only the 12 referrals that resulted in drivers retaining full privileges and no periodic review requirement might fall under the category of "non-quality" referrals (i.e., a 12% "false positive" rate), meaning that the referrals did not lead to licensing actions; the drivers needed no license controls. Two drivers were required to submit medical reports only, with no additional testing requirements; 5 drivers needed to submit medical and vision reports, with no additional testing requirements; and 5 drivers medical and vision reports plus the requirement to take the DMV road test. All 12 referrals thus cost these drivers time and money for the doctor visits, and cost the DMV Medical Review Department time for evaluating the cases. Additional DMV employee time and costs were expended for road testing 5 drivers, in addition to the drivers' time to undergo this testing.

What may be of value to the DMV of these "non-quality" referrals, beyond the statistics that would have been recorded in the CSS database due to their crash involvement or violation experience alone, is the law enforcement officer's observation that the driver may have a medical or functional impairment that contributed to the crash or violation. Because of the referral, the DMV now has medical information about these people that would be considered in cases where the driver is involved in subsequent crashes or violations, or if another Medical Review Request is submitted for these drivers. Each of the 12 MED 3s had officers' comments about the driver's medical condition, or visual, physical, or cognitive impairments. The officers' observations of driver behavior, or statements provided by the drivers or their passengers raised a red flag, prompting their due diligence in referring these drivers for medical review. Four of the drivers were younger than 65 (first 4 bullets listed below) and 8 were 65 or older. The specifics of these 12 referrals are presented below:

- During the traffic stop resulting from a near-head-on crash, it was discovered that the young driver had a run-off-the road crash a week earlier, and suffers from an eye movement disorder that may result in loss of binocular vision. The officer requested a medical review to determine if the driver can operate a car safely with the eye disorder.
- During a traffic stop resulting from driving onto a median toward oncoming traffic, it was discovered that the driver had experienced a loss of consciousness that occurred on two other occasions, and that the driver had a medical condition that causes a slow heart rate.
- Following a traffic stop resulting from a driver failing to maintain a single lane of travel (i.e., crossing the dashed lane lines several times) and nearly causing several crashes as

adjacent drivers tried to change lanes simultaneously to avoid the driver, it was discovered that the driver had a new pair of prescription glasses that were not being worn (they were on the seat beside the driver). When the officer asked the driver to put them on, the driver acted like they hurt the driver's eyes, and the driver was not able to read the date on the (expired) inspection sticker, as requested by the officer.

- An officer responded to a motor vehicle crash where the driver was at fault for running a red light. The driver indicated not seeing the signal because of sun glare; however, the officer indicated not observing this condition. In addition, the driver could not get out of the car without assistance, and due to shakiness, needed assistance walking from the vehicle.
- An officer responded to a crash scene where a driver had just had two minor parking lot crashes. The driver stated being unaware of one of the crashes.
- Following a crash where a driver made a hard left into a jersey barrier, witnesses stated it appeared that the driver fell asleep behind the wheel. The officer made contact with the driver's family members who indicated that the driver dozes at irregular times, such as in the middle of conversations.
- Following a traffic stop resulting from a driver driving southbound in the northbound lanes for 5 miles at 60 mph, the driver was unaware of the reason for the stop, and was unable to provide the officer with the date, time, year, or season. The driver could not recall the past or present, and stated that the year was 1982.
- At the scene of a traffic crash, the older driver indicated being distracted by trying to reach the cell phone, and that this was the second crash of this nature. In both crashes, the driver ran off the road and hit a fixed object while trying to retrieve a cell phone.
- At the scene of a crash, the driver's passenger advised the officer that the driver fell asleep, and that this was the second crash of this nature within a month. The driver indicated having recent bypass surgery and frequently being tired.
- At the scene of a crash, witnesses told the officer that the driver may have heart problems that interfere with the ability to drive safely.
- An officer who stopped behind a parked vehicle to help an elderly couple attempting to open the hood of the car observed that the driver was severely handicapped and was using a walker to stand. The driver needed assistance to stand and walk, and the officer, noting severe physical disability of the driver's legs, requested medical review.
- A driver who indicated being lost, asked an officer for directions. The officer learned that the driver lived a mile away, and had lived in the same home for 20 years. The officer discovered from family members that the driver has dementia.

Of interest in this case-study sample of 100 drivers referred by law enforcement are 7 drivers who had come to the attention of the Medical Review Department on prior occasions. They ranged in age from 50 to 92. Three of the 7 failed to submit the required medical and/or vision reports and therefore had their licenses suspended. The disability codes for the remaining 4 drivers indicated seizures/epilepsy (1 driver), metabolic disorder (2 drivers), and a psychiatric disorder (1 driver). The prior referral sources were: law enforcement (3 drivers), the courts (1

driver), self report (1 driver), and already on periodic review (1 driver, for seizure disorder). Prior referral source was missing for 1 driver. For all 4 drivers who submitted a medical report, the disability code for both medical review processes was the same. The licensing outcomes for the 4 drivers who complied with the department's requests for testing were: licensed with full privileges and no periodic review (1 driver), licensed with full privileges but with periodic review (2 drivers), and suspension for unacceptable medical information (1 driver). Thus, only 1 of the 7 drivers referred on a prior occasion could be considered a "false positive" for being medically at-risk.

A review of the 100 narratives identified 10 cases where, in the researcher's opinion, the officer omitted information describing the driver's condition underlying the reason for requesting a medical review, and the violation or crash type was not considered a "red flag" of medical impairment. The outcomes for 4 of these cases (drivers 21, 47, 72, and 74 years old), were license suspensions as a result of the drivers' failures to submit medical reports from their physicians. Another driver (age 71) submitted the medical report, but failed to comply with the DMV's order to take the written and road test, resulting in a suspended license. If it can be assumed that these 5 drivers self-selected themselves out of the population of licensed drivers (by not complying with the DMV's request for medical reports and testing) because they realized they shouldn't be driving, then these 5 referrals could be considered "good quality referrals."

There was one situation where a driver (age 72) submitted a medical report, but received a license suspension because of the information provided by the physician about the driver's medical condition (a cardiovascular disorder). This referral is also "good quality referral."

The remaining 4 drivers complied with all medical review requirements and received licensing actions, either in the form of restrictions or periodic reviews; these are also considered good-quality referrals. There was one situation where the driver (age 65) submitted a medical report that showed a seizure disorder, resulting in continuing driving privileges without restriction, but with a requirement for periodic review in 2-year intervals. There were 2 situations where the drivers (age 70 and 87) complied with the requirement to submit a medical report, as well as orders to take and pass the written and road tests. Upon completion of the DMV tests, the drivers were licensed with new license restrictions (one limiting driving to a 25-mile radius of home and the other to a 10-mile radius of home) and both were required to submit periodic review reports annually. Finally, one driver (age 55) was licensed with no restrictions, but required periodic reporting in 1-year intervals for a metabolic disorder.

In summary, 88% of the law enforcement referrals examined in the case study resulted in license actions, indicating that law enforcement is an effective source of referrals of medically at-risk drivers. Law enforcement is an active source of referrals—accounting for 35% of all referrals into the medical review unit during the period from which these data were extracted. In a given year in Virginia, approximately 31% to 35% of the referrals come from law enforcement. *To capitalize on the involvement of this important audience, we suggest that NHTSA continue to promote education and training programs to help law enforcement identify at-risk drivers and procedures for reporting them to license authorities.*

RESULTS OF MEDICAL REVIEW PROCESS FOR OTHER-REFERRED DRIVERS

Referral Sources and Rates

During the period of interest for this case study (October 2009 to Jan 2010), a total of 2,966 drivers were referred to the Virginia DMV Medical Review Unit for re-evaluation. Table 6 presents the number and percentage of referrals by all referral sources during the 4-month period, as well as for the entire year in 2009.

Table 6. Number (and Percentage) of Drivers Referred for Medical Review, By Referral Source, and Time Period.

Referral Source	4-Month Period 10/2009 to 1/2010	12-Month Period 1/2009 – 12/2009
Court-Adjudicated Mentally Incapacitated	330 (11.1%)	685 (8.7%)
Court (General District, Traffic)	25 (0.8%)	108 (1.4%)
Self-Referral	584 (19.7%)	1,077 (13.7%)
DMV Representative	701 (23.6%)	2,164 (27.6%)
Dept. Blind and Vision Impaired	322 (10.9%)	768 (9.8%)
Family Member	76 (2.6%)	230 (2.9%)
Physician	117 (3.9%)	348 (4.4%)
Law Enforcement (State, Local, Federal)	804 (27.1%)	2,451 (31.2%)
Hospital	0 (0.0%)	0 (0.0%)
Concerned Citizen	7 (0.2%)	16 (0.2%)
Total	2,966	7,847

Driver Age and Sex

As described earlier, we selected 15 cases for in-depth review from each of the first 7 referral sources shown in Table 6, for a total of 105 cases. This sample ranged in age from 14 to 99 (mean = 66.7, s.d. = 22.8). The sample of 105 drivers was comprised of 58 males (55%) and 47 females (45%).

Drivers younger than the minimum age for holding a learner's permit (15.5 years) are included in the sample. This is because the DBVI refers everyone 14 and older for medical review when they apply for services, regardless of their license status.

Table 7 presents the number and percentage of drivers within each 10-year age group. Drivers younger than 20 and those 60 to 69 were represented in the sample at a prevalence that is equal to their proportion in the population of licensed drivers in Virginia (see Table 1). Drivers age 20 to 59 were underrepresented in the sample, based on their proportion in the population of licensed drivers, and drivers 70 and older were overrepresented in the sample. Table 8 summarizes the age distribution for each referral source. Caution is advised in generalizing from this small sample size; however, on average, referrals for people adjudicated as mentally incapacitated and referrals from the DBVI include a larger proportion of younger people, while referrals from family members include a larger proportion of older people, when compared to drivers referred by the other referral sources. Drivers 70 and older comprised 60% of the sample, across referral sources.

Table 7. Number and Percentage of Drivers in 10-Year Age Groupings Included in the Sample of 105 Other-Referred Drivers.

Driver Age Group	Number of Drivers	Percentage of Sample
<20	5	5%
20-29	9	9%
30-39	4	4%
40-49	6	6%
50-59	5	5%
60-69	13	12%
70-79	23	22%
80-89	28	27%
90+	12	11%
Total	105	

Table 8. Summary Statistics Describing Ages of Other-Referred Drivers, by Referral Source.

Referral Source	Age Range	Mean Age	Standard Deviation
Court-Adjudicated Mentally Incapacitated	17-92	57.2	26.8
Court (General District, Traffic)	21-95	64.6	25.8
Self Referral	19-90	69.5	21.1
DMV Representative	28-99	66.9	19.7
Dept. Blind and Vision Impaired	14-97	59.6	27.3
Family Member	28-91	79.4	16.4
Physician	39-94	69.9	17.5

Reasons for Referral

A summary of the circumstances leading to the medical review requests is provided in Table 9, categorized by TransAnalytics. More detail about the referral sources and conditions is presented below.

One driver with a *cardiovascular condition* self-referred for medical review when completing a license renewal form by answering “Yes” to the question: “Do you have a physical or mental condition which requires that you take medication?” The driver indicated taking blood thinning medication and other heart medications, and having had heart surgery and a pace maker. The other driver with a cardiovascular condition was referred by a family member who stated on the MED 3 form that the driver has progressively worsening congestive heart failure with periodic episodes of drop in blood pressure that causes momentary lapses in concentration and physical weakness.

The driver with a *bipolar disorder* was referred by the court as adjudicated mentally incapacitated. The driver with *blackouts* was referred by a traffic court judge, following a statement in court that the driver had experienced a blackout. The driver with *confusion* was referred by a physician, who stated that the driver was recently crash-involved and also had been exhibiting significant confusion recently.

Drivers described as having *dementia* were referred by three sources: the courts as adjudicated mentally incapacitated (6 drivers), family members (7 drivers), and physicians (3 drivers). The drivers described as having a *developmental disorder, mental retardation, autistic disorders, and adults in need of a guardian* were all referred by the courts as adjudicated mentally incapacitated.

The driver with *headaches* was self-referred upon answering “Yes” to the question of medical conditions requiring medications. This driver indicated taking Topamax (topiramate, an anticonvulsant).

The drivers described as having *memory disorders* were referred by traffic court (1 driver), family members (2 drivers), and physicians (2 drivers). Four of the 5 people were also described as recently crash involved, 2 with multiple crashes. One of the drivers had two near-crashes resulting from pulling out in front of oncoming traffic. One family member indicated the driver gets lost while driving to familiar locations, and on several occasions family members have responded to phone calls from neighbors who have recognized the driver in need of assistance while lost.

Two of the drivers with *psychological issues* were referred by traffic court judges, 2 by DMV staff, and 1 was self referred. The self-referred driver answered the question about medical conditions requiring medications in the affirmative, indicating taking Geodon (ziprasidone, an antipsychotic) and Abilify (aripiprazole, an antipsychotic and antidepressant). DMV staff referred 1 driver after the individual failed the knowledge test and was “hearing voices.” Another DMV representative referred a customer who appeared to go into a medical trance and became combative with a security officer. One of the drivers referred by traffic court had been cited with reckless driving and self-reported having panic attacks. The other driver had a history of medical and psychiatric conditions, takes 16 medications, and indicated sleepwalking at the time of the crash.

Table 9. Medical and Functional Conditions Described on MED 3 Form, As Reasons for Requesting Medical Review of Other-Referred Drivers.

Type of Condition	Number of Referrals	Age Range
Cardiovascular	2	81 and 91
Cognitive/Neurological: Bipolar Disorder	1	21
Cognitive/Neurological: Blackouts	1	21
Cognitive/Neurological: Confusion	1	62
Cognitive/Neurological: Dementia	16	71-92
Cognitive/Neurological: Developmental Disorder	1	18
Cognitive/Neurological: Headaches Requiring Medication	1	30
Cognitive/Neurological: Incapacitated Adult in Need of Guardian	4	62-87
Cognitive/Neurological: Memory Disorder	5	59-87
Cognitive/Neurological: Mental Retardation	2	43 and 59
Cognitive/Neurological: Psychological	5	19-65
Cognitive/Neurological: Seizure	6	23-73
Cognitive/Neurological: Autistic Disorder	2	17 and 18
Cognitive/Neurological: Sleep Disorders	3	44-87
Cognitive/Neurological: Tremors	3	60-85
Cognitive/Neurological: Unspecified	1	58
Metabolic: Diabetes	1	70
Physical: Head/Neck Range of Motion Limitation	2	39 and 55
Physical: Weakness	1	80
Physical: Slowed or Difficulty Walking, and Walking With Canes or Walkers	6	45-99
Physical: Using a Wheelchair and Can Not Get Out of It	1	60
Physical: Driver Wants Automatic Transmission Restriction Removed	1	65
Red Flag Driving Behavior Described (No Medical or Functional Reason Provided) Plus Advanced Driver Age	8	70-93
Red Flag Driving Behavior Described Only, But Not Older	1	37
Unspecified	3	75-95
Vision: Cataracts, Glaucoma, and/or Macular Degeneration	9	75-94
Vision: Retinal Scar	1	90
Vision: Unspecified	15	14-97
Vision: Visual Field Defect	2	62 and 85

The drivers described as having *seizures* were referred by traffic court (1 driver), self (1 driver), family (1 driver), and physicians (3 drivers). The self-referred driver reported (on the license application form) having seizures controlled with Dilantin (phenytoin, an antiepileptic).

The drivers described as having *sleep disorders* were referred by DMV representatives (2 drivers) and family (1 driver). One DMV representative observed a customer slumped over the clipboard in the DMV waiting area with eyes closed. After the DMV representative woke the customer up (with some difficulty) the customer indicated having narcolepsy, but not having taken the medication to control it. Another customer was referred through a letter from a DMV in another State, indicating that the driver had moved from that State to Virginia, and was required by that State to submit medical reports in order to maintain a valid license. The driver referred by a family member was described as having sleep apnea so severe that the driver fell

asleep while driving, and rolled the vehicle three times before landing right side up in the median strip. The family member indicated having observed the relative fall asleep in the midst of a conversation with six people.

All 3 drivers described as having *tremors* were referred by DMV representatives. The DMV representatives observed head and hand shakiness in the drivers as they applied for license renewal. The representatives requested medical review, indicating that the symptoms may be indicative of a stroke or other neurological disorder. One representative questioned the driver about the negative response to the question of medical conditions requiring medications, believing that the driver had a medical condition causing the tremors.

The driver with a cognitive disorder categorized as “other” by TransAnalytics was referred by a physician, who did not indicate the type of condition, but indicated that based on medical and neurological testing, the driver may have difficulties driving.

The driver described as having *diabetes* was a self referral, following responses on the license application questions.

One driver described as having *restricted head/neck range of motion* was referred by a physician and the other was self-referred. The physician referred the driver, requesting a skills test to see whether the driver could adequately compensate (by using mirrors) for head/neck restrictions resulting from a newly diagnosed medical condition. The other driver reported having four damaged neck disks and taking medications (but specified not when driving). This driver also requested a handicap tag (on mirror) for parking. The driver described as having physical weakness was referred by a traffic court judge.

All 6 drivers described as *slow walkers, or using a cane or walker*, were referred by DMV customer representatives, based on their observations of the drivers in the customer service center. One customer was described as walking very slowly; this customer advised the DMV representative of a condition called lymphedema resulting in a swollen leg.³ The same customer could not bend to do the eye screening, and instead had to hold the machine up in order to read it. Another was described as walking slowly as well as being unable to fill out and sign the application. This customer advised the DMV representative that a physician advised against driving. Another customer was described as using two canes to assist in mobility, yet the customer listed no medical disabilities when completing the renewal application form. Another customer who came into the DMV using a walker indicated use of the walker due to constant leg pain. This customer checked “No” to the question about the presence of medical conditions or medications that could affect safe driving ability. Another license renewal customer was observed using a walker with great difficulty. The customer was also described as having difficulty writing due to stiffness in the hands, and needed physical assistance with correct head positioning for the license photograph. Another customer with a walker indicated recovering from a heart attack and heart surgery. The DMV representative described this customer as having an extreme amount of difficulty moving around the license office. The last customer was

³ Leg lymphedema is the pooling of fluids in the lower extremities due to a compromised lymphatic system, causing a swelling.

in a wheel chair, and could not get out without assistance. This individual checked “No” to the question about medical conditions/medications.

The drivers with *visual conditions* including cataracts, glaucoma, macular degeneration, and retinal scars were all self-referrals with the exception of 2 drivers; 1 referred by a physician and the other by traffic court. The 15 people referred with unspecified visual impairment were referred by the DBVI, and were not necessarily drivers. The two drivers with a visual field defect were referred by a family member (1 driver), and a physician (1 driver).

Seven of the 9 drivers referred with only descriptions of *red-flag driving behavior* (i.e., no medical conditions were provided in the description on the MED 3 form) were referred by traffic court judges and 2 drivers were referred by family members. Descriptions of poor driving behavior included: multiple crashes; minor fender benders in the driveway; weaving across the edge and centerlines multiple times in a quarter-mile straight stretch of highway; driving the wrong way on a highway; difficulty looking behind the vehicle while backing and keeping car moving in the correct path; disorientation at night due to visual loss; sudden unintended acceleration blamed on a sticky accelerator that the mechanic was unable to replicate; unsafe lane change; and driving down the centerline of a roadway, lost.

The 3 drivers referred without descriptions of driver behavior or medical conditions were referred by a physician, traffic court, and a DMV representative.

Referral Processes and Outcomes

Figure 2 describes the DMV-ordered requirements for the 105 drivers in this case study sample. It shows where, in the medical review process, drivers were suspended for failure to comply with the DMV requirements to submit medical reports, and where they failed to meet medical, functional, or skill requirements for continuing licensure, resulting in license suspension. It also presents license disposition following medical review.

Drivers Who Failed to Comply With DMV Requirement to Submit Medical and Vision Reports

Table 10 presents the number of drivers who complied versus did not comply with the DMV requirement to submit medical and vision reports, by referral source. The 54 drivers who did not comply with this DMV requirement received a notice of license suspension 30 days following the date of the letter advising them of this requirement.

Ten of the 15 drivers referred by the courts as mentally incapacitated either had no driver license histories, or their histories indicated application and renewal of identification cards only. Only 1 of the 5 who were licensed at some point complied with the request to submit a report from a physician. This driver was 21. Similarly, 6 of the 15 drivers who were referred by the DBVI either had no driver license histories or their histories indicated that they had only applied for identification cards. Only 1 of the remaining 9 drivers who had ever been licensed complied with the requirement to submit a vision report from an eyecare specialist. This driver was 69.

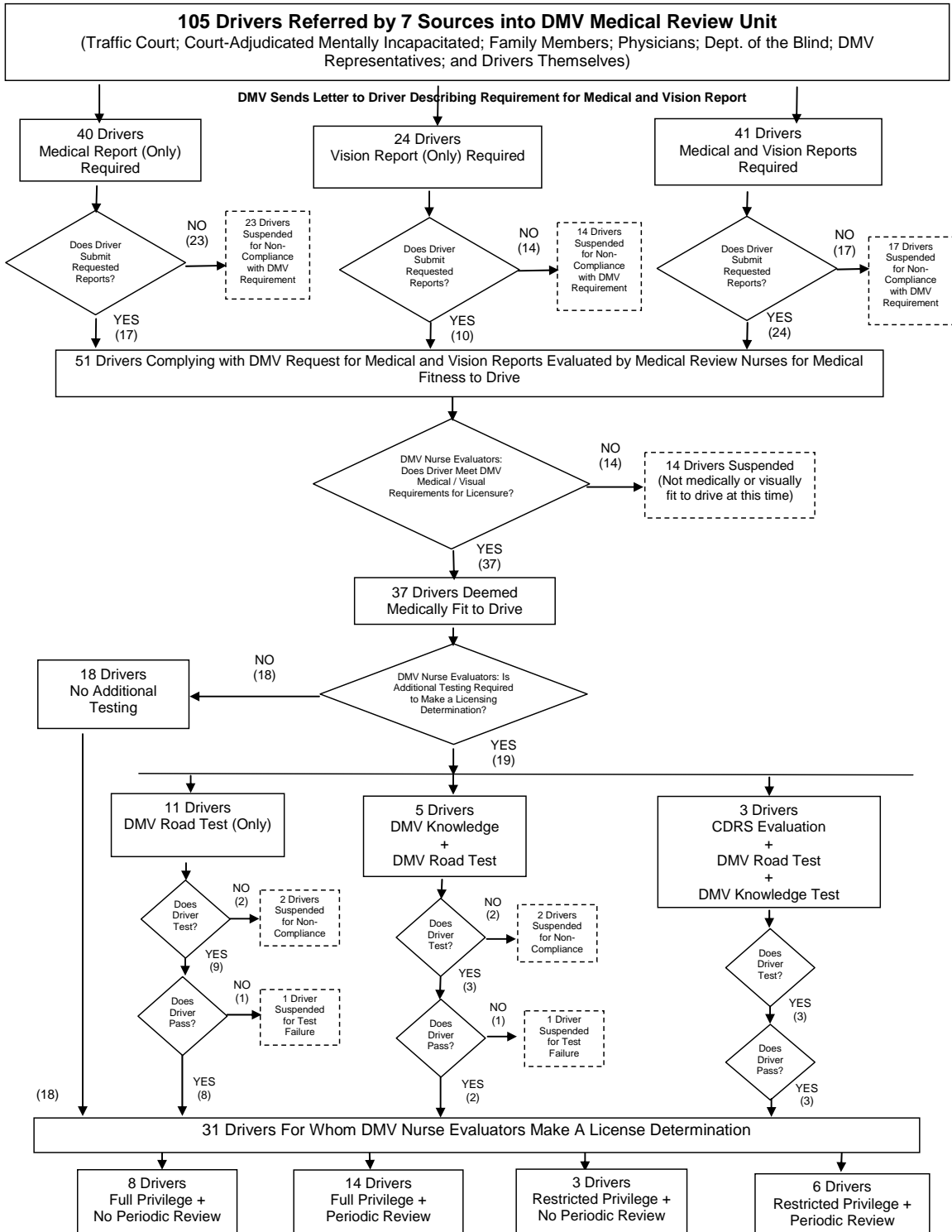


Figure 2. Medical Review Process and Outcomes for 105 Drivers Referred for Medical Review by "Other" Sources.

Table 10. Compliance With DMV Requirements to Submit Medical and Vision Reports, By Referral Source.

Did Driver Comply With Medical/Vision Report Requirement?	Referral Source							Total
	Court: Adjudicated Mentally Incapacitated	Court: General District Traffic	Self	DMV	DVBI	Family	Physician	
Yes	1 (7%)	9 (60%)	15 (100%)	9 (60%)	1 (7%)	8 (53%)	8 (53%)	51 (49%)
No	14 (93%)	6 (40%)	0	6 (40%)	14 (93%)	7 (47%)	7 (47%)	54 (51%)
Total	15	15	15	15	15	15	15	105

Excluding the 15 drivers referred by DBVI and the 15 drivers referred by the courts as adjudicated mentally incapacitated, summary statistics describing the ages of drivers who complied versus those who did not are presented in Table 11.

Table 11. Age of Drivers Versus Compliance in Submitting Medical and Vision Reports.

Did Driver Comply With Medical/Vision Report Requirement?	Number	Age Range	Average Age	Standard Deviation
Yes	49	19-99	71.8	20.9
No	26	21-95	66.7	19.5

The sample of 105 drivers who continued in the medical review process was reduced to 51, following elimination of the 54 drivers who did not submit the required medical or visual reports to the Medical Review Department.

Drivers with Unacceptable Medical or Vision Reports

Fourteen of the 51 drivers who complied with the requirement to submit a medical or vision report had their licenses suspended because they did not meet the DMV medical or visual requirements for safe operation of a motor vehicle. Table 12 presents the number of drivers who were medically and visually fit to drive versus those who were not, by referral source. It should be noted that the driver who was adjudicated mentally incapacitated was adjudged restored to capacity by judicial decree, and only then did the nurse evaluators consider the medical report that was submitted.

Table 12. Number and Percentage of Drivers Deemed Medically and Visually Fit to Drive versus Not Fit to Drive, by Referral Source.

Does Driver Meet Medical & Visual Standards for Driving?	Referral Source							Total
	Court: Adjudicated Mentally Incapacitated	Court: General District Traffic	Self	DMV	DBVI	Family	Physician	
Yes	1 (100%)	7 (78%)	15 (100%)	7 (78%)	0	3 (38%)	4 (50%)	37 (73%)
No	0	2 (22%)	0	2 (22%)	1 (100%)	5 (62%)	4 (50%)	14 (27%)
Total	1	9	15	9	1	8	8	51

The 14 drivers who were not medically fit to drive had disability codes indicating the following general conditions: seizures/epilepsy (2 drivers), Alzheimer’s or other dementia (7 drivers), musculoskeletal disorders (2 drivers), pulmonary disorders (1 driver), and visual disorders (2 drivers). They ranged in age from 28 to 94 (mean = 78.1, s.d. = 19.4). For 9 of the 14 drivers, physicians indicated on the DMV medical form that an evaluation by a CDRS was needed to determine fitness to drive. Eight drivers did not undergo this evaluation, and their driving privileges were suspended, based on unacceptable medical reports. The driver who did undergo evaluation by a CDRS failed the evaluation, with the CDRS recommending that the individual retire from driving. The license was subsequently suspended.

Additional Testing and Evaluation Requirements

There were 37 drivers who the DMV nurse evaluators deemed medically fit to drive, following their review of the medical and vision reports submitted by these drivers (i.e., the medical reports were “acceptable”). Table 13 presents the disability codes assigned to the 37 drivers, based on the information contained in the medical reports. As noted earlier, the presentation of a disability code in this report as a facsimile for a driver’s medical/functional status is an oversimplification, because it represents only one of many symptoms or conditions that may be driver-impairing.

No Additional Testing. There were 18 drivers for whom no additional testing was required for a licensing determination to be made. These drivers ranged in age from 19 to 90 (mean = 68, s.d. = 23.9) and had disability codes indicating the following medical conditions: seizures/epilepsy (3 drivers), cardiovascular (3 drivers), psychiatric (3 drivers), and visual (9 drivers). The referral sources for these drivers were courts – adjudicated mentally incapacitated (1 driver), general traffic court (2 drivers), self (12 drivers), DMV (2 drivers), and physicians (1 driver). Thirteen drivers were licensed with full privileges (10 of whom were placed on periodic review), and 5 were licensed with restrictions (4 of whom were also placed on periodic review). Restrictions were corrective lenses (2 drivers) and daylight only (3 drivers). The 14 drivers placed on periodic review were required to submit reports in 6 months (2 drivers) and 1 year (12 drivers).

Table 13. Disability Codes and Number of “Other-Referred” Case Subjects Deemed Medically Fit to Drive.

Disability Code	Description	Number of Subjects Deemed Medically Fit to Drive (n=37)
1	Neurological – Seizures/Epilepsy	3
2	Neurological – Traumatic Brain Injury	0
3	Neurological – Cerebral Vascular Accident (stroke)	1
4	Neurological – Dementia	2
5	Neurological – Alzheimer’s	0
6	Neurological – Paralysis/Spinal Cord	0
7	Neurological – Multiple Sclerosis	0
8	Neurological – Other Condition	4
9	Cardiovascular Disorder (e.g., ventricular tachycardia, sinus bradycardia, hypertension, congestive heart failure, coronary artery disease)	5
10	Metabolic Disorder (generally diabetes)	2
11	Musculoskeletal (e.g., osteoporosis, scoliosis, cerebral palsy)	2
12	Psychiatric (e.g., bipolar, anxiety, depression, post traumatic stress disorder)	7
13	Pulmonary (e.g., chronic obstructive pulmonary disease/COPD, emphysema)	0
14	Substance Abuse	0
15	Vision (e.g., cataracts, glaucoma, macular degeneration, constricted visual fields)	11

Road Test Only. Eleven drivers were required to take and pass the skills test before license decisions could be made. These drivers ranged in age from 30 to 99 (mean = 68.8, s.d. = 21.5). The referral sources for these drivers were general traffic court (2 drivers), self (3 drivers), DMV (4 drivers), family (1 driver), and physicians (1 driver). Their disability codes indicated the presence of the following medical conditions: (other) neurological (3 drivers), cardiovascular (2 drivers), metabolic (1 driver), musculoskeletal (1 driver), psychiatric (3 drivers), and visual (1 driver). Two drivers (age 82 and 85) did not take the road test, and their licenses were suspended for failure to comply with the DMV testing requirement. One driver failed the road test (age 76) and his license was suspended. Eight drivers passed the road test and retained their driving privileges. Seven drivers were licensed with full privileges, with 3 of these drivers placed on periodic review (1 driver at 3-month intervals and 2 drivers at 1-year intervals). The driver who received a restricted license was required to wear a hearing aid, and was prohibited from driving on interstate roadways. This driver was also placed on periodic review at 1-year intervals.

DMV Knowledge and Road Tests. Five drivers were required to take and pass both the DMV knowledge test and the skills test, before a license decision could be made. These drivers ranged in age from 27 to 87 (mean = 59.0, s.d. = 24.5). Two were referred by the traffic court judges, 1 was referred by a DMV representative, and 2 were referred by family members. Their disability codes indicated the presence of the following medical conditions: stroke, neurological condition (other), metabolic, psychiatric, and visual. Two drivers (age 27 and 78) did not take the tests, and their licenses were suspended for failure to comply with the DMV testing requirement. One driver (age 59) took the knowledge test but failed, and driving privileges were suspended.

The 2 drivers who took and passed both tests were permitted to retain their driving privileges; 1 received full privileges and the other was restricted from nighttime and interstate driving. Neither driver was placed on periodic review.

CDRS Evaluation, Plus DMV Knowledge and Road Tests. Three drivers were required to undergo an evaluation by a CDRS even before a determination of fitness to drive could be made. The physicians who completed the medical reports for these drivers indicated that an evaluation by a CDRS was necessary for such a determination. The 3 drivers ranged in age from 80 to 82 (mean = 80.7, s.d. = 1.2). Two had disability codes indicating dementia and one indicating a musculoskeletal condition. One driver was referred by a traffic court judge, and 2 by physicians. One of the physician-referred drivers was already on periodic review (1-year cycles) with a diagnosis code indicating dementia. The physician continued to mark on the medical forms that a CDRS evaluation was required for continued licensure. All 3 drivers passed the CDRS evaluation, and were permitted to continue with the two DMV tests. All 3 drivers took and passed the knowledge and skills tests. One driver was licensed with full privileges, and was placed on periodic review at 1-year intervals. One driver received a restricted license requiring corrective lenses and hearing aids, and no periodic review. The driver who was already on periodic review already had a restricted license; no new restrictions were added as a result of the evaluation. However, the individual was placed on one cycle of periodic review at 3 months, and was then placed on 6-month periodic review cycles.

Licensing Outcomes

Table 14 summarizes the outcomes of the Medical Review Process for the entire sample of 105 drivers referred to the DMV Medical Review Department by the seven referral sources of interest in this case study.

Of the 31 drivers who complied with all DMV medical review requirements and were medically fit to drive, 8 were licensed with full privilege and no periodic review requirements. They ranged in age from 30 to 99 (mean = 68, s.d. = 22.9). Their disability codes indicated the following medical conditions: (other) neurological (4 drivers), cardiovascular (3 drivers), and musculoskeletal (1 driver). Three of the 8 drivers came to the attention of medical review services through self referrals (answering “yes” to questions about medical conditions and medications on license application and renewal forms), 4 through DMV representatives observing signs of medical conditions or functional limitations among drivers conducting business at the DMV, and one through traffic court.

Fourteen drivers were also licensed with full privileges, but were required to undergo periodic review. They ranged in age from 19 to 90 (mean = 23.6, s.d = 23.6). Their disability codes indicated the following medical conditions: seizures/epilepsy (2 drivers), dementia (1 driver), psychiatric (5 drivers), and visual (6 drivers). Nine of the 14 drivers came to the attention of the Medical Review Department through a self referral.

Three drivers were licensed with restricted privileges, but no periodic review requirement. They were age 49, 80, and 87. Their disability codes indicated the following medical conditions: psychiatric, musculoskeletal, and metabolic. Two were restricted to driving

Table 14. Licensing Outcomes Following Medical Review, by Referral Source.

License Outcome Following Medical Review	Referral Source							Total
	Court Adjudicated Mentally Incapacitated	Traffic Court	Self	DMV	DBVI	Family	Physician	
Full Privilege and No Periodic Review		1	3	4				8
Full Privilege and Periodic Review	1		9	1			3	14
Restricted Privilege and No Periodic Review		1		1		1		3
Restricted Privilege and Periodic Review		1	3			1	1	6
Suspension for Unacceptable Medical Report		2		2	1	5	4	14
Suspension for Failure to Comply With Medical Review Orders	14	9		7	14	7	7	58
Suspension for DMV Test Failure		1				1		2
Total	15	15	15	15	15	15	15	105

with corrective lenses (one also with hearing aids), and one was restricted from driving on interstate roadways and at nighttime.

Six drivers were licensed with restricted privileges and were required to submit periodic medical or vision reports. They ranged in age from 23 to 91 (mean = 72.3, s.d. = 25.4). Their disability codes indicated the following medical conditions: seizures/epilepsy (1 driver), dementia (1 driver), cardiovascular (1 driver), and vision (3 drivers). Half of these drivers came to the attention of medical review services through self-referrals, while the other 3 were referred by traffic court judges, family members, and physicians.

Prior Referrals

There were 6 drivers in the sample who had been referred for medical review on a prior occasion. These drivers ranged in age from 28 to 95 (mean = 68.2, s.d. = 27.6). They were referred by the court as adjudicated mentally incapacitated (1 driver), traffic court (1 driver), DMV representatives (1 driver), DBVI (1 driver), and physicians (2 drivers). Their disability codes indicated the following medical conditions: epilepsy/seizures (1 driver), dementia (2 drivers), cardiovascular (1 driver), psychiatric (1 driver), and visual (1 driver). Three did not comply with the DMV requirement to submit medical or vision reports and had their driving privileges suspended. Of the 3 who complied with the medical/vision report requirement, 2 were deemed fit to drive and 1 was not (resulting in a license suspension for this driver). Both drivers who were deemed fit to drive were licensed with periodic review requirements, 1 with a restricted license (but no new restriction as a result of the re-evaluation) and the other with full privileges. Thus, licensing actions were applied to all 6 drivers who had been referred on prior occasions as a result of the most current referral, indicating that the current referral was a quality referral.

Referrals Without Descriptive Causes for Concern

None of the DBVI referrals included a description of the individual's functional impairments or dangerous driving behavior, but because the referral source provides services to people who are blind or otherwise visually impaired, the cause for concern was obviously due to vision impairment. Referral of people receiving services from DMVI is required by Virginia law. By definition, all DBVI referrals are quality referrals.

Three other drivers were referred without descriptions of driver behavior or medical conditions. Two of the 3 drivers (referred by a physician and traffic court) failed to comply with the requirement to submit a medical report, and their licenses were suspended (age 75 and 95). The driver referred by a DMV representative without a description of concern (age 75) was licensed without restrictions, but was placed on periodic medical review for an oxygen dependent pulmonary disorder. These 3 referrals resulted in license actions and are therefore considered quality referrals.

Summary and Recommendations

Just over half of the sample of other-referred drivers (54 of 105, or 51%) had their licenses suspended for failure to submit medical or vision reports. Another 4 drivers had their licenses suspended because they failed to comply with DMV knowledge or skills testing requirements. These 58 referrals were regarded as quality referrals, because a licensing action resulted. This includes "pre-license" actions for 16 people who were not licensed at the time they were referred due to severe cognitive or visual disabilities. For these 16 drivers, information was provided to the DMV precluding licensure without further assessment. The 42 drivers who were licensed at the time of their referral and chose not to comply with the reporting requirements may have realized that they were not medically or functionally capable of operating a motor vehicle safely, and the referral prompted them to give up their driving privileges.

Another 14 drivers had their privileges suspended because information provided in the medical or vision reports indicated they were not fit to drive at the present time. These, too, were quality referrals, as were the 2 additional drivers who could not pass the DMV knowledge or road tests, and had their privileges suspended.

Of the remaining 31 referrals, 23 resulted in licensing actions in the form of driving restrictions or periodic review requirements, indicating that those referred had a visual, physical, or cognitive impairment that could place the driver or public at risk, but continuing medical review and/or restricting driving to less risky situations could mitigate the risk. Thus, a total of 97 drivers (92%) received a licensing action—either suspension, restriction, or periodic reporting requirements—as a result of their referral into the Medical Review Department.

Only 8 drivers out of the total sample of 105 (8%) were deemed fit to drive without restriction or continuing medical review. Although they exhibited signs of potential impairment while in the DMV service center or while driving, or they indicated having medical conditions that required medications, their physicians provided information indicating that they were

medically fit to drive, and they passed the DMV road test (if it was required as part of the evaluation), indicating that they had the skills necessary for continuing driving privileges without medical oversight or restrictions. The DMV customer service representatives and the traffic court did their due diligence in referring these drivers for medical review; descriptions of the driver behavior of concern are presented below:

- Traffic court referral: an older driver had a crash in a parking lot and indicated the accelerator stuck. A mechanic was unable to replicate the accelerator malfunction and the vehicle passed a self-test.
- Three self-referrals: an older driver who indicated having heart surgery and a pace maker and taking blood-thinning medications; a middle-aged driver indicating taking Topomax for headaches; and an older driver requesting removal of an automatic transmission restriction.
- Four DMV referrals: an older driver using two canes, an older driver shaking a lot (suspected stroke), an older driver with head and upper body tremors, and a middle-aged driver who fell asleep in the DMV customer service center and volunteered having narcolepsy and had not taken the medication to control it.

There are two novel populations in the “other-referred” driver sample: *court-adjudicated mentally incapacitated* and those referred because they applied for services from the DBVI. The majority of the people referred by these sources did not hold drivers’ licenses (16 of the 30), and driving privileges were suspended for 29 of the 30 referrals from these two sources. The courts and DBVI provide information that is often pro-active, because if these (non-licensed) people apply for a driver license, the prior referral generates information in the licensing system computers indicating a cognitive or visual impairment that needs to be assessed before a license is issued. Together, these two sources account for approximately 20% of the drivers referred in a given year (see Table 6).

Family members have the benefit of first-hand observations of their loved-one’s physical, cognitive, and visual ability, and often observe unsafe driving behaviors and evidence (e.g., fender-benders) resulting from these impairments. They are a valued source of referrals of drivers who would otherwise go unnoticed until becoming crash or violation-involved. Yet, family members referred only 3% of all drivers referred for medical review in 2009 (see Table 6). Family members can serve as a front-line source of referrals, prompting driver re-evaluation before an adverse driving event occurs. Virginia Code § 46.2-322 prohibits the DMV from releasing information on the identity of a person submitting a request for medical review, and the reasons for requesting the review, for the following sources: relatives of the driver, physicians, physician assistants, nurse practitioners, pharmacists, and other licensed medical professionals who treat or prescribe medications for the driver.

In the small sample of 15 drivers referred by family members, 87% had their licenses suspended, and the remaining drivers who maintained driving privileges received restrictions, with one also required to submit periodic medical reports. Adult daughters and sons referred 13 of the 15 older drivers referred by family members. *The researchers suggest that a public information and educational campaign be developed targeting the adult children of medically at-risk drivers, describing driver-impairing medical conditions and age-related functional*

impairments, red flag driving behaviors manifested by these deficits, how to refer a driver to the DMV, and how the evaluation process works. An example is provided by New York State's Office for the Aging handbook to help families, friends and caregivers facing the dilemma of what to do when an aging loved one is at-risk driving. It is titled "When You Are Concerned."⁴

Similarly, *physicians* have a wealth of knowledge about their patients' medical and functional conditions, but may not always understand the consequences for driving or know about the DMV's medical review process. In the sample of 15 drivers referred by physicians for this case study, 73% had their licenses suspended, and those who maintained driving privileges either received license restrictions and/or were placed on periodic review. Physicians are valued referral sources, yet they accounted for only 4% of the drivers referred for medical review in 2009. The vehicle code protects the identity of physicians who refer drivers for medical review in Virginia.

An information and educational campaign directed to physicians is recommended, to increase their rate of referrals of medically at-risk drivers. The campaign should include information describing medical conditions, medications, and functional impairments that may increase crash risk, how to evaluate drivers for their ability to operate a vehicle safely, how to refer drivers to the DMV, and what the evaluation process involves. Although the American Medical Association (AMA) and NHTSA have developed such a guide (Physician's Guide to Assessing and Counseling Older Drivers, see Carr, Schwartzberg, Manning, & Sempek, 2010),⁵ only a minority of doctors are members of AMA, so the AMA information outreach effort needs to be expanded. Brown-bag seminars may provide a convenient outreach mechanism for providing this information to healthcare professionals. An office-based screening tool may also provide evidence of driver-impairing functional conditions. Based on the understanding that some physicians do not want to refer their patients to the DMV, the educational campaign should also describe the role of driver rehabilitation specialists (DRSs) in remediating physical and cognitive impairments that can affect safe driving, and locations of such specialists in their area. Physicians may then refer their patients to DRSs first, and only refer those patients to the DMV who do not comply with the physician's recommendation to undergo DRS evaluation.

Prosecutors and judges who try and hear cases in traffic court are also a valued source of referrals, as they have the opportunity to observe the driver's physical and cognitive behavior during the court session, along with the knowledge of the type of crash or violation that brought the driver to the attention of law enforcement. In the sample of 15 drivers referred by traffic courts, 12 had their licenses suspended, and 2 drivers received driving restrictions and/or periodic medical reporting requirements. Only 1 driver maintained full privileges and no reporting requirements. In 2009, traffic courts accounted for only 1% of the drivers referred for medical review.

An educational and informational campaign to educate judges and prosecutors is recommended to increase their referral rate of medically at-risk drivers. It should include information about driving behaviors that may indicate medical or age-related functional impairment (e.g., "Red Flags of Medically At-Risk Drivers"), medical conditions and

⁴ Available at: www.aging.ny.gov/Caregiving/OlderDriver/Handbook2007.pdf

⁵ Available at: www.ama-assn.org/go/olderdrivers or www.nhtsa.gov/staticfiles/nti/older_drivers/pdf/811298.pdf

medications that may impair safe driving, age-related functional impairments that may increase crash risk, and how to refer at-risk drivers to the DMV Medical Review Department for evaluation.

DMV Customer Service Representatives are a large source of referrals, second only to law enforcement. DMV Representatives accounted for 28% of the drivers referred in 2009. In the sample of 15 drivers selected for this case study, 9 (or 60%) had their driving privileges suspended, 2 received restricted licenses or periodic review requirements, and 4 maintained full driving privileges with no reporting requirements. Although their rate of “false positives” is higher than the other referral sources evaluated, the reasons for their referral indicated valid concerns for safe driving ability that warranted physician review and knowledge and/or road testing. The license renewal cycle in Virginia is 8 years; the DMV estimated that in 2009, 966,227 renewal notices were mailed. Drivers may renew by mail every other renewal cycle with certain exceptions including: drivers under medical review and drivers 80 and older. As indicated by Cobb and Coughlin (1997) the single most important criteria for identifying an impaired driver is how he or she looks coming through the door at the DMV. This is echoed by Petrucelli and Malinowski (1992), who state that “the examiner’s personal contact with the applicant is the only routine opportunity to detect potential problems of the functionally impaired driver, and this opportunity should not be lost because of inadequate examiner training.” It is unknown what proportion of the license renewals renewed in person, but DMV representatives referred 2,164 drivers in 2009 and 1,401 in 2008. *Continuing DMV programs to educate customer service representatives about the signs of medical and age-related impairment are recommended.*

Similarly, screening drivers for medical conditions and medications that may impair safe driving using questions on the DMV applications for original and renewal licenses is an effective way to identify potentially at-risk drivers for medical review. Such *self-referrals* accounted for 14% of the drivers referred for review in 2009. Although all 15 self-referred drivers sampled for this study maintained driving privileges, 12 received restrictions and/or periodic review. License determinations required no DMV resources beyond nurse evaluator review of medical and/or visual reports for 12 of the 15 drivers. Further testing was required only for 3 drivers, (DMV road test), indicating low time and cost requirements for DMV resources for the majority of self-referred drivers. Together, DMV representatives and self-reports accounted for 3,241 of the drivers referred in 2009. Based on the count of renewal notices mailed in 2009 (996,227), these two sources tagged less than 1% (0.33%) of the renewal population in the State for closer examination.

A general public education campaign to educate people about the dangers of driving with physical or mental impairments (regardless of whether they are caused by age-related functional impairments or medical conditions) may be beneficial in fostering social norms for the referral, remediation, and when necessary, the restriction and suspension of at-risk drivers, similar to campaigns to reduce drug- and alcohol-impaired driving, and texting while driving.

In summary, the other-referred driver sample had a “quality referral rate” of 92% compared to the law enforcement-referred sample of 88%. These high numbers indicate that those who refer medically at-risk drivers to the VA DMV are providing a valuable public safety

service. The “non-quality” referrals may serve as data for future licensing decisions regarding these drivers, if they become crash- or violation-involved, or they are referred for medical review a second time. Targeted information and educational campaigns are recommended to increase the rate of referrals for several sources, and to maintain high rates of referrals from others.

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**APPENDIX A: FORM USED TO REFER DRIVERS TO THE VIRGINIA
MEDICAL REVIEW SERVICES DEPARTMENT (MED 3)**



MEDICAL REVIEW REQUEST

MED 3 (06/11/2008)

Purpose: Use this form to request the Department of Motor Vehicles (DMV) to conduct a medical review of a licensed driver.

Instructions: Print or type all information. Complete form in its entirety. Mail completed form to Medical Review Services at the above address, or fax to Medical Review Services at 1-804-367-1604.

DRIVER INFORMATION			
DRIVER NAME (last)	(first)	(middle)	GENDER <input type="checkbox"/> Male <input type="checkbox"/> Female
BIRTH DATE (mm/dd/yyyy)		DRIVER LICENSE CUSTOMER NUMBER	VEHICLE PLATE NUMBER
TELEPHONE NUMBER ()		If you change either your residence/home address or mailing address to a non-Virginia address, your driver's license or photo identification (ID) card may be canceled.	
RESIDENCE/HOME ADDRESS	CITY	STATE	ZIP CODE
MAILING ADDRESS (if different from above address)	CITY	STATE	ZIP CODE

REQUESTER INFORMATION			
Based on my observation, I believe the driver named above should be given the following tests: <input type="checkbox"/> Medical Examination <input type="checkbox"/> Vision Examination <input type="checkbox"/> Knowledge Examination <input type="checkbox"/> Road Skills Test			
I understand that the Department of Motor Vehicles may have additional requirements.			
Describe in <u>detail</u> the circumstances that led to this request. Please provide as much information as possible including a description of what appears to be the driver's mental, physical or visual impairment. Use an additional sheet if necessary.			
Have you viewed the "At Risk Older Drivers" training DVD? <input type="checkbox"/> Yes <input type="checkbox"/> No			
REQUESTER NAME (print)		REQUESTER BADGE NUMBER	
ORGANIZATION/LAW ENFORCEMENT AGENCY NAME	TELEPHONE NUMBER ()	FAX NUMBER ()	
BUSINESS ADDRESS	CITY	STATE	ZIP CODE
REQUESTER SIGNATURE			DATE (mm/dd/yyyy)

CONTACT INFORMATION/NOTICE	
If you have questions, contact Medical Review Services at: 1-804-367-6203 (Voice) 1-800-272-9268 (Deaf or Hearing Impaired Only) 1-804-367-1604 (Fax)	Virginia Code § 46.2-322 provides that if the driver submits a written request, DMV will furnish the reasons for the examination, including the identity of anyone who supplied information regarding fitness to drive a motor vehicle. However, this law states that the DMV cannot provide the information if the source is a relative or licensed medical professional treating the driver.

APPENDIX B: CUSTOMER MEDICAL REPORT



CUSTOMER MEDICAL REPORT

Purpose: Use this form to request medical information from your physician or nurse practitioner.

Instructions: Follow the detailed INSTRUCTIONS printed on page 2. Complete the Customer Information and Information Release Approval sections on this page. Take the entire MED 2 and DMV letter to your physician or nurse practitioner to complete the sections that pertain to your medical condition. Part F must be completed by your physician or nurse practitioner. Note: Any charges related to or incurred as part of the completion of this form are the customer's responsibility.

CUSTOMER INFORMATION						
NAME (Last) _____ (First) _____ (MI) _____ (Suffix) _____			CUSTOMER NUMBER (from your driver's license) or SSN _____			
RESIDENCE/HOME ADDRESS _____					<input type="checkbox"/> Check if this is a new address, your address will be changed on DMV's system.	
CITY _____		STATE _____	ZIP CODE _____	CITY OR COUNTY OF RESIDENCE _____		
MAILING ADDRESS (if different from above) _____						
CITY _____				STATE _____	ZIP CODE _____	DAYTIME TELEPHONE NUMBER _____
BIRTH DATE (mm/dd/yyyy) _____	GENDER <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE		WEIGHT _____ lbs	HEIGHT _____ FT _____ IN		
Describe, in detail, your medical condition.						
Do you take prescription/non-prescription medications? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, list below. (attach a separate sheet if more space is required)						
NON-PRESCRIPTION MEDICATION	DOSAGE	TIME(S) TAKEN	PRESCRIPTION MEDICATION	DOSAGE	TIME(S) TAKEN	
Have you ever experienced a blackout, seizure, loss of consciousness, or syncope? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, enter date of last episode.			DATE (mm/dd/yyyy) _____	Did the episode result in a motor vehicle crash? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Explain what happened during the episode.						

COMMERCIAL DRIVER LICENSE DISABILITY WAIVER OR HAZARDOUS MATERIALS VARIANCE
Are you applying for a commercial driver license disability waiver or a hazardous materials variance? <input type="checkbox"/> YES <input type="checkbox"/> NO If YES, a CDL Disability Waiver or Hazardous Materials Variance Application (MED 30) must also be submitted.

INFORMATION RELEASE APPROVAL	
I authorize _____ and/or _____ a licensed medical provider to complete this Customer Medical Report, submit it to DMV and, if necessary to provide further clarification or information to DMV about my physical and/or mental condition. I consent to DMV using this information to arrive at a decision concerning my ability to safely operate a motor vehicle. I also authorize DMV to use the above customer information to correctly identify my records on file in accordance with the Virginia Privacy Protection Act of 1976. I understand that Virginia Code § 46.2-208(b)(1) prohibits DMV from releasing medical data to anyone other than a physician, physician assistant or nurse practitioner	
CUSTOMER SIGNATURE AND AUTHORIZATION (parent must sign for a minor)	DATE (mm/dd/yyyy)



CUSTOMER MEDICAL REPORT INSTRUCTIONS

Purpose: Use these instructions to complete the Customer Medical Report (MED 2).

CUSTOMER INSTRUCTIONS

1. Review all correspondence received from the Department of Motor Vehicles (DMV) regarding concerns about your ability to safely operate a motor vehicle.
 - If you received an Official Notice/Order of Suspension, you must provide DMV with the required Customer Medical Report, (MED 2) prior to the effective date noted in the Notice/Order to avoid having your driving privilege suspended.
 - If your driving privilege is suspended, you will be required to provide proof of legal presence in order to reinstate your driver's license, if you have not already provided proof.
 2. Complete the sections of the MED 2 titled "Customer Information" and "Information Release Approval". Be sure to provide your signature at the end of the "Information Release Approval" section.
 3. Take the entire MED 2 and your DMV letter to your medical provider at the time of your medical examination.
 4. Request your medical provider to complete the parts of the MED 2 that pertain to your medical condition(s) and Part F and return the report to DMV (following medical provider instructions below).
 - The medical examination must be conducted after the issue date of your Official Notice/Order of Suspension.
 - If you were involved in a recent motor vehicle crash or have experienced a recent blackout, seizure or loss of consciousness, the MED 2 report must reference these incidents and/or events.
- Note: you will be notified of any decisions regarding your driving privilege based on:
- Medical and other related information received from your medical provider,
 - DMV driver license test results and/or a certified independent driver rehabilitation evaluation (if required),
 - DMV medical review policies and guidelines as established in collaboration with the DMV Medical Advisory Board.
5. If you have questions related to DMV's requirement for you to submit a MED 2, you may contact DMV Medical Review Services:
 - Mail - send your request in writing to Medical Review Services at the address listed at the top of this form
 - Telephone - (Voice) 1-804-367-6203 or (Deaf/Hearing Impaired only) 1-800-272-9268

MEDICAL PROVIDER INSTRUCTIONS

1. The Department of Motor Vehicles (DMV) is seeking information that will allow us to make a decision regarding your patient's ability to safely operate a regular motor vehicle and/or commercial motor vehicle. DMV is concerned about any condition(s) and/or use of medication(s) which may result in impaired:
 - level of consciousness/alertness
 - vision/perception
 - motor skills/range of motion
 - judgment/cognitive function
 - reaction time
2. Based on the examination that you conduct, please complete the parts of the MED 2 that pertain to your patient's medical condition(s).
 - If your patient was involved in a recent motor vehicle crash or has experienced a recent blackout, seizure or loss of consciousness, the MED 2 report must reference these incidents and/or events.
 - For medical conditions, complete one or more of the following specific report sections:
 - Neurological/Musculoskeletal - Part A & F
 - Metabolic - Part B & F
 - Cardiovascular - Part C & F
 - Pulmonary - Part D & F
 - Psychiatric/Substance Abuse - Part E & F

NOTE: Only one Part F is required if the same medical provider completes multiple report sections.
3. In lieu of completing the MED 2, you may submit a letter, note or copies of records as long as the information you submit addresses all of the information requested on the MED 2.
4. Return the completed MED 2 to DMV by mailing it to DMV Medical Review Services at the address on the top of this form.
5. For additional information on DMV's medical review process, you may refer to www.dmvnow.com under "Citizen Services", then "Medical Information", or contact Medical Review Services at 804-367-6203.

Customer Medical Report

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NAME (Last)	(First)	(M)	(Suffix)	BIRTH DATE (mm/dd/yyyy)	CUSTOMER NUMBER or SSN
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The Department of Motor Vehicles (DMV) is seeking information that will allow us to make a decision regarding your patient's ability to safely operate a regular motor vehicle and/or commercial motor vehicle. DMV is concerned about any condition(s) and/or use of medication(s) which may result in impaired:
 level of consciousness/alertness vision/perception motor skills/range of motion judgment/cognitive function reaction time
 Based on the examination that you conduct, please complete the parts of the MED 2 that pertain to your patient's medical condition(s) and Part F.

PART A - NEUROLOGICAL/ MUSCULOSKELETAL REPORT (must also complete Part F)		
Length of time individual has been your patient. YEARS _____ MONTHS _____	Have you examined this individual during the last six months? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, enter examination date.	EXAMINATION DATE (mm/dd/yyyy)
DIAGNOSIS(ES) (In order of severity or by current treatment)		
Are there any complications related to this/these condition(s)? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain.		
Has the patient been hospitalized for the above condition(s) within the past year? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, list dates hospitalized and status upon discharge.		
Was the hospitalization voluntary? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Does the patient have a history of seizures? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, provide date of each episode and reason(s).		
Indicate the risk for further episodes.		
Did any seizure result in a motor vehicle crash? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, enter date of crash.	DATE OF CRASH (mm/dd/yyyy)	
Was the last medication blood serum level within acceptable range? <input type="checkbox"/> YES <input type="checkbox"/> NO If No, provide results of blood test.	BLOOD TEST RESULTS	
Does the patient have any motor deficits/nerve problems that would impair his/her ability to drive? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Does the patient have any other neurological condition(s) that might affect his/her driving? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, describe the condition(s) and its effect on the patient's driving.		
Does the patient have any chronic conditions, chronic pain syndromes, fibromyalgia or any movement disorders? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, specify.		
Is the patient prescribed medication for chronic pain or long-acting narcotics? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, list the medication(s).		
Does the patient have the use of all extremities? <input type="checkbox"/> YES <input type="checkbox"/> NO If No, which extremities are impaired?		
Does the patient suffer from peripheral neuropathy? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, which extremities are impaired?		
Current blood levels of anticonvulsant medication	TEST DATE (mm/dd/yyyy)	Results of most recent EEG
Does the neuropathy affect the patient's ability to safely operate a motor vehicle? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Does the patient suffer from muscle spasms? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Does the patient have full range of motion of the head and neck? <input type="checkbox"/> YES <input type="checkbox"/> NO If No, describe range of motion.		
Is adaptive equipment recommended? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, what type of adaptive equipment does the patient require?		
Does the patient require a driver evaluation? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, examination should be with: <input type="checkbox"/> an independent certified driver rehabilitation specialist (CDRS) <input type="checkbox"/> a DMV Examiner <input type="checkbox"/> or both.		

Go to Part F

Customer Medical Report

NAME (Last)	(First)	(M)	(Suffix)	BIRTH DATE (mm/dd/yyyy)	CUSTOMER NUMBER or SSN
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The Department of Motor Vehicles (DMV) is seeking information that will allow us to make a decision regarding your patient's ability to safely operate a regular motor vehicle and/or commercial motor vehicle. DMV is concerned about any condition(s) and/or use of medication(s) which may result in impaired:
 level of consciousness/alertness vision/perception motor skills/range of motion judgment/cognitive function reaction time
 Based on the examination that you conduct, please complete the parts of the MED 2 that pertain to your patient's medical condition(s) and Part F.

PART B - METABOLIC REPORT (must also complete Part F)		
Length of time individual has been your patient. YEARS _____ MONTHS _____	Have you examined this individual during the last six months? <input type="checkbox"/> YES <input type="checkbox"/> NO IF Yes, enter examination date.	EXAMINATION DATE (mm/dd/yyyy)
DIAGNOSIS(ES) (In order of severity or by current treatment)		
Are there any complications related to this/these condition(s)? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain.		
Has the patient been hospitalized for the above condition(s) within the past year? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, list dates hospitalized and status upon discharge.		
Was the hospitalization voluntary? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Does the patient have diabetes or any other metabolic condition(s) that might affect vehicle operation? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, indicate condition.		
Do any complications or associated conditions exist? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain.		
Does this patient have hypoglycemic reactions? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, provide dates and reasons.		
Did the hypoglycemic reaction(s) result in a motor vehicle crash(es)? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Does this patient demonstrate how to counter a hypoglycemic reaction? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain how.		
Has this patient been hospitalized for treatment of diabetes/hypoglycemia or complications in the past year? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain		
Does the patient monitor his/her blood sugar? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, how often?		
Attach the following information/documents. If you suffered a hypoglycemic event, please ensure that your blood sugar logs reflect the last 15 days and your A1C results are drawn after the incident occurred and within the last 30 days.		
Blood Sugar Logs (15 days) <input type="checkbox"/> Attached Hemoglobin A1C Results (30 days) <input type="checkbox"/> Attached		

Go to Part F

Customer Medical Report

MED 2 (08/25/2010)
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NAME (Last)	(First)	(M)	(Suffix)	BIRTH DATE (mm/dd/yyyy)	CUSTOMER NUMBER or SSN
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The Department of Motor Vehicles (DMV) is seeking information that will allow us to make a decision regarding your patient's ability to safely operate a regular motor vehicle and/or commercial motor vehicle. DMV is concerned about any condition(s) and/or use of medication(s) which may result in impaired:
 level of consciousness/alertness vision/perception motor skills/range of motion judgment/cognitive function reaction time
 Based on the examination that you conduct, please complete the parts of the MED 2 that pertain to your patient's medical condition(s) and Part F.

PART C - CARDIOVASCULAR REPORT (must also complete Part F)	
Length of time individual has been your patient. YEARS _____ MONTHS _____	Have you examined this individual during the last six months? <input type="checkbox"/> YES <input type="checkbox"/> NO IF Yes, enter examination date.
EXAMINATION DATE (mm/dd/yyyy)	
DIAGNOSIS(ES) (In order of severity or by current treatment)	
Are there any complications related to this/these condition(s)? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain.	
Has the patient been hospitalized for the above condition(s) within the past year? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, list dates hospitalized and status upon discharge.	
Was the hospitalization voluntary? <input type="checkbox"/> YES <input type="checkbox"/> NO	
Does the patient have an implantable cardioverter defibrillator? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, give implant date.	
Has the unit discharged since the implant? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, describe the patient's condition at the time and date of discharge.	
Does the patient have a ventricular assist device system? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, when was this device implanted?	
Has the patient had any of the following:	
Cardiovascular surgery and/or other procedures? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain and give dates.	
Syncope? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain and give dates.	Attach the following information/documents: <input type="checkbox"/> Results of Event Monitor <input type="checkbox"/> Results of Holter Monitor <input type="checkbox"/> Results of Tilt-table Test <input type="checkbox"/> Results of EKG
Fatigue with exertion? <input type="checkbox"/> YES <input type="checkbox"/> NO Fatigue at rest? <input type="checkbox"/> YES <input type="checkbox"/> NO	
Dyspnea with exertion? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain and give dates.	
Dyspnea at rest? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain and give dates.	
Pulmonary symptoms? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain and give dates.	

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Customer Medical Report

MED 2 (08/25/2010)
Page 6

NAME (Last)	(First)	(M)	(Suffix)	BIRTH DATE (mm/dd/yyyy)	CUSTOMER NUMBER or SSN
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The Department of Motor Vehicles (DMV) is seeking information that will allow us to make a decision regarding your patient's ability to safely operate a regular motor vehicle and/or commercial motor vehicle. DMV is concerned about any condition(s) and/or use of medication(s) which may result in impaired:
 ○ level of consciousness/alertness ○ vision/perception ○ motor skills/range of motion ○ judgment/cognitive function ○ reaction time
 Based on the examination that you conduct, please complete the parts of the MED 2 that pertain to your patient's medical condition(s) and Part F.

PART D - PULMONARY REPORT (must also complete Part F)		
Length of time individual has been your patient. YEARS _____ MONTHS _____	Have you examined this individual during the last six months? <input type="checkbox"/> YES <input type="checkbox"/> NO IF Yes, enter examination date.	EXAMINATION DATE (mm/dd/yyyy)
DIAGNOSIS(ES) (In order of severity or by current treatment)		
Are there any complications related to this/these condition(s)? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain.		
Has the patient been hospitalized for the above condition(s) within the past year? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, list dates hospitalized and status upon discharge.		
Was the hospitalization voluntary? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Is oxygen use required? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, describe treatment regimen and provide number of liters.		
Fatigue with exertion? <input type="checkbox"/> YES <input type="checkbox"/> NO Fatigue at rest? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Dyspnea with exertion? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain and give dates.		
Dyspnea at rest? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain and give dates.		
Syncope from cough? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain cause and resolution.		
Does the patient have a diagnosis of sleep apnea, narcolepsy, or other sleep disorder? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Does the pulmonary disease prevent activities of daily living? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, identify.		
Has patient been compliant with treatment to the extent that the symptoms are controlled? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Attach the following information/documents: <input type="checkbox"/> Pulse oximetry _____ room air _____ oxygen <input type="checkbox"/> Results of pulmonary function test <input type="checkbox"/> Results of sleep study		

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NAME (Last)	(First)	(M)	(Suffix)	BIRTH DATE (mm/dd/yyyy)	CUSTOMER NUMBER or SSN
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The Department of Motor Vehicles (DMV) is seeking information that will allow us to make a decision regarding your patient's ability to safely operate a regular motor vehicle and/or commercial motor vehicle. DMV is concerned about any condition(s) and/or use of medication(s) which may result in impaired:
 ○ level of consciousness/alertness ○ vision/perception ○ motor skills/range of motion ○ judgment/cognitive function ○ reaction time
 Based on the examination that you conduct, please complete the parts of the MED 2 that pertain to your patient's medical condition(s) and Part F.

PART E - PSYCHIATRIC/SUBSTANCE ABUSE REPORT (must also complete Part F)		
Length of time individual has been your patient. YEARS _____ MONTHS _____	Have you examined this individual during the last six months? <input type="checkbox"/> YES <input type="checkbox"/> NO IF Yes, enter examination date.	EXAMINATION DATE (mm/dd/yyyy)
DIAGNOSIS(ES) (In order of severity or by current treatment)		
Are there any complications related to this/these condition(s)? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain.		
Has the patient been hospitalized for the above condition(s) within the past year? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, list dates hospitalized and status upon discharge.		
Was the hospitalization voluntary? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Has the patient been hospitalized in the past year for a mental/emotional condition? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, give admission date(s), reason(s) for admission and date (s) of discharge.		
Does the patient have a condition, which results in one or more of the impairments listed below? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, check all that apply.		
<input type="checkbox"/> Poor decision-making/problem-solving skills	<input type="checkbox"/> Hallucinations/delusions	<input type="checkbox"/> Poor/impaired judgement
<input type="checkbox"/> Memory loss, Cognitive	<input type="checkbox"/> Extremely aggressive/destructive behavior	<input type="checkbox"/> Dementia/confusion
<input type="checkbox"/> Poor impulse control/extremely impulsive	<input type="checkbox"/> Emotional or behavioral instability	
Identify current treatment program(s), counseling, medications, etc.		
Attach the following information/documents, (if available): MMSE <input type="checkbox"/> attached <input type="checkbox"/> not available Neuropsychological Exam <input type="checkbox"/> attached <input type="checkbox"/> not available		
Is patient CURRENTLY undergoing OR has patient successfully completed drug/alcohol treatment? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain.		
Did the patient experience seizure(s) related to withdrawal? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, give date(s).		
Has the patient been compliant with substance abuse treatment? <input type="checkbox"/> YES <input type="checkbox"/> NO		
Attach the following information/documents: <input type="checkbox"/> Results of drug/alcohol screening <input type="checkbox"/> Report from substance abuse counselor <input type="checkbox"/> Recommendations:		

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(MUST BE COMPLETED BY PHYSICIAN OR NURSE PRACTITIONER)

NAME (Last)	(First)	(MI)	(Suffix)	BIRTH DATE (mm/dd/yyyy)	CUSTOMER NUMBER or SSN
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PART F - GENERAL RECOMMENDATIONS

FIRST MEDICAL PROVIDER					
Is the patient's condition(s) stable? <input type="checkbox"/> YES <input type="checkbox"/> NO If No, explain.			Is the patient compliant with treatment <input type="checkbox"/> YES <input type="checkbox"/> NO If No, explain:		
Does the patient experience side effects of medications, which are likely to impair driving ability? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain:					
Based on this examination, is the patient medically capable of: • safely operating a motor vehicle? <input type="checkbox"/> YES <input type="checkbox"/> NO and/or • operating a commercial motor vehicle includes tractor trailers, passenger buses, tank vehicles, school buses for 16 or more occupants (including the driver), or vehicles carrying hazardous materials? <input type="checkbox"/> YES <input type="checkbox"/> NO					
Based on this examination, patient needs the following: (check each appropriate item) <input type="checkbox"/> to be retested by DMV on <input type="checkbox"/> Knowledge <input type="checkbox"/> Road <input type="checkbox"/> Both <input type="checkbox"/> an adaptive device/equipment required to safely operate a motor vehicle. <input type="checkbox"/> a driver evaluation (with a certified independent driver rehabilitation specialist CDRS). <input type="checkbox"/> a prosthetic/orthotic device to operate a motor vehicle For clarification on any of the above, contact Medical Review Services at 804 367-6203.					
Based on this examination, the patient's driving ability is likely to be impaired by limitations in the following areas: (check each appropriate item)					
Judgment and Insight		Sensorimotor Function			
<input type="checkbox"/> Problem Solving and Decision Making	<input type="checkbox"/> Cognitive Function	<input type="checkbox"/> Strength and Endurance	<input type="checkbox"/> Maneuvering Skills		
<input type="checkbox"/> Emotional or Behavioral Stability	<input type="checkbox"/> Reaction Time	<input type="checkbox"/> Range of Motion	<input type="checkbox"/> Use of Arm(s) and/or Leg(s)		
ADDITIONAL RECOMMENDED RESTRICTIONS			MEDICATIONS		
PHYSICIAN/NURSE PRACTITIONER NAME (print)			MEDICAL SPECIALTY		
MEDICAL LICENSE NUMBER	EXPIRATION DATE (mm/dd/yyyy)	ISSUING STATE	TELEPHONE NUMBER ()	FAX NUMBER ()	
PHYSICIAN/NURSE PRACTITIONER SIGNATURE				DATE (mm/dd/yyyy)	

If you have questions or need more information to complete this page, call Medical Review Services (804) 367- 6203.

SECOND MEDICAL PROVIDER					
Is the patient's condition(s) stable? <input type="checkbox"/> YES <input type="checkbox"/> NO If No, explain.			Is the patient compliant with treatment <input type="checkbox"/> YES <input type="checkbox"/> NO If No, explain:		
Does the patient experience side effects of medications, which are likely to impair driving ability? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, explain:					
Based on this examination, is the patient medically capable of: • safely operating a motor vehicle? <input type="checkbox"/> YES <input type="checkbox"/> NO and/or • operating a commercial motor vehicle includes tractor trailers, passenger buses, tank vehicles, school buses for 16 or more occupants (including the driver), or vehicles carrying hazardous materials? <input type="checkbox"/> YES <input type="checkbox"/> NO					
Based on this examination, patient needs the following: (check each appropriate item) <input type="checkbox"/> to be retested by DMV on <input type="checkbox"/> Knowledge <input type="checkbox"/> Road <input type="checkbox"/> Both <input type="checkbox"/> an adaptive device/equipment required to safely operate a motor vehicle. <input type="checkbox"/> a driver evaluation (with a certified independent driver rehabilitation specialist CDRS). <input type="checkbox"/> a prosthetic/orthotic device to operate a motor vehicle For clarification on any of the above, contact Medical Review Services at 804 367-6203.					
Based on this examination, the patient's driving ability is likely to be impaired by limitations in the following areas: (check each appropriate item)					
Judgment and Insight		Sensorimotor Function			
<input type="checkbox"/> Problem Solving and Decision Making	<input type="checkbox"/> Cognitive Function	<input type="checkbox"/> Strength and Endurance	<input type="checkbox"/> Maneuvering Skills		
<input type="checkbox"/> Emotional or Behavioral Stability	<input type="checkbox"/> Reaction Time	<input type="checkbox"/> Range of Motion	<input type="checkbox"/> Use of Arm(s) and/or Leg(s)		
ADDITIONAL RECOMMENDED RESTRICTIONS			MEDICATIONS		
PHYSICIAN/NURSE PRACTITIONER NAME (print)			MEDICAL SPECIALTY		
MEDICAL LICENSE NUMBER	EXPIRATION DATE (mm/dd/yyyy)	ISSUING STATE	TELEPHONE NUMBER ()	FAX NUMBER ()	
PHYSICIAN/NURSE PRACTITIONER SIGNATURE				DATE (mm/dd/yyyy)	

If you have questions or need more information to complete this page, call Medical Review Services (804) 367- 6203.

APPENDIX C: DRIVER'S LICENSE AND IDENTIFICATION CARD APPLICATION

PARENT OR GUARDIAN CONSENT FOR APPLICANTS UNDER 18 (Unless applicant is married - marriage certificate required)		
I authorize issuance of a learner's permit/driver's license/identification card. I certify that the applicant is a resident of Virginia. I certify that the applicant is attending school regularly and is in good academic standing, but if not, I authorize issuance of a learner's permit/driver's license. I certify that this applicant will operate a motor vehicle for at least 45 hours (15 of which will occur after sunset) while holding a learner's permit.		
If my child attends public school, I authorize the principal or designee of the public school attended by the applicant to notify the juvenile and domestic relations district court (within whose jurisdiction the applicant resides) when the applicant has had 10 or more unexcused absences from school on consecutive school days.		
I certify that the statements made and the information submitted by me regarding this certification are true and correct.		
PARENT/GUARDIAN NAME (print)	PARENT/GUARDIAN SIGNATURE	DATE (mm/dd/yyyy)
APPLICANT UNDER AGE 18 Have you ever been found not innocent of any offense in a Juvenile and Domestic Relations Court in this or any other state? <input type="checkbox"/> YES <input type="checkbox"/> NO If you answered YES, a court within your jurisdiction must provide court consent below.		
COURT CONSENT In my opinion the applicant's request for a learner's permit/driver's license <input type="checkbox"/> should be granted. <input type="checkbox"/> should not be granted. Remarks:		
JUDGE NAME (print)	JUDGE SIGNATURE	DATE (mm/dd/yyyy)

COMMERCIAL DRIVER'S LICENSE APPLICANTS		
Complete this CERTIFICATION OF QUALIFICATION by checking the box for the category that applies. (For requirements refer to the Code of Federal Regulations or VA Motor Carrier Safety Regulations).		
INTERSTATE DRIVER <input type="checkbox"/> I meet the qualification requirements of Part 391 of the Federal Motor Carrier Safety Regulations. <input type="checkbox"/> I am exempt from the qualification requirements of Part 391 of the Federal Motor Carrier Safety Regulations.	INTRASTATE DRIVER <input type="checkbox"/> I meet the qualification requirements of the Virginia Motor Carrier Safety Regulations. <input type="checkbox"/> I am exempt from the qualification requirements of the Virginia Motor Carrier Safety Regulations.	
VEHICLE TYPE I want to be licensed to operate the type of vehicle(s) checked below: <input type="checkbox"/> A - Combination vehicle with GVWR or GCWR of 26,001 lbs. or more <input type="checkbox"/> B - Single vehicle with GVWR of 26,001 lbs. or more, or towing a vehicle less than 10,000 lbs. GVWR. <input type="checkbox"/> C - Any vehicle that does not fit the definition of a Class A or Class B vehicle and is either used to transport hazardous materials or designed to carry 16 or more passengers, including the driver.	ENDORSEMENT I want to apply for the following vehicle endorsement(s): <input type="checkbox"/> H - Hazardous Materials <input type="checkbox"/> N - Tank <input type="checkbox"/> P - Passenger Carrying Vehicle (16 or more passengers) <input type="checkbox"/> S - School Bus (16 or more passengers) <input type="checkbox"/> T - Double/Triple Trailer	Identify any state(s) in which you have been previously licensed within the past 10 years. Provide additional information using the Supplemental Driver's Licensing History Sheet, form DL1PA. STATE(S) LICENSE NUMBER LICENSE ISSUE DATE (mm/dd/yyyy) LICENSE EXPIRATION DATE (mm/dd/yyyy)
AIR BRAKES <input type="checkbox"/> With <input type="checkbox"/> Without		

GOVERNMENT EMPLOYEES - (Fee waiver certification)
I certify that I am employed by the: <input type="checkbox"/> Commonwealth of Virginia or <input type="checkbox"/> City of <input type="checkbox"/> County of <input type="checkbox"/> Town of _____ to operate a motorcycle or commercial motor vehicle and, because of such employment, I am entitled to the waiver of the motorcycle class and/or commercial motor vehicle endorsement fee, provided I have paid for and hold a valid Virginia driver's license or have made application for such.

SELECTIVE SERVICE
All males under the age of 26 are required to check one of the following. Failure to provide a response will result in denial of your application. <input type="checkbox"/> I am already registered with Selective Service. <input type="checkbox"/> I am a non-immigrant alien in the U.S. and not required to register. <input type="checkbox"/> I authorize DMV to forward to the Selective Service System personal information necessary to register me with Selective Service.
By signing this application, I consent to be registered with Selective Service, if required by federal law. If under age 18, an appropriate adult must complete and sign below: I authorize DMV to send information to Selective Service which will be used to register applicant when he is 18 years old.
SIGNATURE (check one and sign) <input type="checkbox"/> PARENT/GUARDIAN <input type="checkbox"/> JUDGE, JUVENILE DOMESTIC RELATIONS COURT <input type="checkbox"/> EMANCIPATED MINOR

CERTIFICATION AND SIGNATURES		
I certify and affirm that I am a resident of Virginia, that all information presented in this application is true and correct, that any documents I have presented to DMV are genuine, and that my appearance, for purpose of my DMV photograph, is a true and accurate representation of how I generally appear in public. I make this certification and affirmation under penalty of perjury and understand that knowingly making a false statement on this application is a criminal violation		
APPLICANT NAME (print)	APPLICANT SIGNATURE	DATE (mm/dd/yyyy)

DOT HS 811 484
July 2011



U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

