

Periodic Physical Examination of Drivers

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CONSIDERING the importance of human factors in driving safely and the lethality of motor vehicles, today's driver unquestionably should be in a physical and mental condition which will not be hazardous to himself and his fellow men.

Pennsylvania is pioneering in a program to remove hazardous drivers from behind automobile steering wheels. On June 1, 1960, a program of required medical examinations for drivers was put into operation. The program was one item of a 13-point traffic safety program announced by Gov. David L. Lawrence on February 2, 1960.

The medical requirements are being enforced by the Pennsylvania Department of Revenue, which has the legal responsibility for licensing drivers and motor vehicles in the State. The Pennsylvania law concerned with drivers' licenses has had a general clause for many years requiring the licensee to be free of disorders which might prevent him from driving properly. Licenses have been removed, suspended, or restricted upon a decision of the bureau of traffic safety of the department of revenue that the individual was incapable of properly handling an automobile. However, the bureau had no well-defined procedures or medical standards for making such decisions until the present program was established.

A number of case histories of severe accidents on Pennsylvania highways have clearly indicated the danger to life and limb caused by

drivers suffering from severe physical and mental disorders. Investigation of one fatal crash revealed that a man on the pension roll for the blind had been operating a light truck, his steering being directed by a child sitting between his legs. In another instance, a truck-driver hauling gasoline on a tractor-trailer truck was in seven or eight accidents before it was discovered that he was subject to convulsive seizures. Not long ago, a mentally disturbed young man who had at one time received psychiatric treatment drove east in the westbound lane on one of the high-speed highways in the State for about 40 miles at night. He turned off his headlights and drove at speeds of 90 to 100 miles per hour. He was killed when his car crashed into a roadblock the police had thrown across the highway.

The driver examination program, designed to prevent such occurrences, did not spring forth suddenly. An important early step was the establishment of a section of traffic epidemiology in the Pennsylvania Department of Health in 1958. The need for such a close involvement of a health department with traffic safety has been clearly delineated at workshops on traffic safety, held in Washington, D.C., in 1958, 1960, and 1961, at which representatives from the American Association of Motor Vehicle Administrators met with State health officers.

It has become clearly evident from a number of studies, including those of the American Medical Association's Committee on Medical Aspects of Automobile Injuries and Deaths, that human failure overshadows all other factors in the causation of highway accidents. Thus, the work of health departments in the field of traffic safety is concerned mainly with the human factors in the causation of accidents. The Pennsylvania State Health Department's

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program has been based mainly on three subjects: physical standards for licensing drivers, the alcoholic and his driving ability, and studies of accident repeaters.

Standards and Procedures

The Governor's Traffic Safety Council and the Pennsylvania Medical Society's board of trustees agreed upon the need for uniform physical standards for drivers licensed in the State. The standards that were adopted for the medical examinations were developed by the Pennsylvania Medical Society, which set up subcommittees for specific areas of standardization in October 1958. The subcommittee titles included general medicine, cardiovascular diseases, neurological disorders, visual standards, auditory standards, orthopedic standards, mental health, and drug and chemical aspects. These titles were similar to those used by a symposium on medical aspects of motor vehicle accident prevention held in December 1956 by the New York University-Bellevue Medical Center and the Center for Safety Education of New York University (1).

Using all the studies on their subjects that they could obtain, the committees reported a year later to the board of trustees of the medical society, which accepted the report. The report was forwarded to the secretary of health and to the Governor's Traffic Safety Council. The secretary of health served as a liaison between the medical society and the secretary of revenue. The Pennsylvania Optometric Association had submitted a somewhat different set of standards for visual testing, but one meeting between the association's committee and the medical society's committee on visual standards quickly resolved the differences. The standards were then approved in principle by the Governor's Traffic Safety Council. They were later accepted by the Governor and the secretary of revenue and, after a tooling-up period, put into effect on June 1, 1960.

The standards were not considered to be final or unequivocal, as pointed out in the introduction to the report on driver standards: "Because of the sparsity and unreliability of statistical data, the standards which follow are based on an armchair analysis. Since automobile trans-

portation is such an important economic factor, the emphasis is on restricting rather than revoking licenses. A functional approach has been attempted wherever possible. The diagnostic entity is important in predicting progression and recurrence of signs and symptoms."

The report also recommended that the examination be given all drivers on initial application for a license and reexaminations be given at ages 30, 40, 50, 60, and 65 years, and every 5 years thereafter. Periodic examination is our aim, but it will take several years to complete the initial examination of the 5½ million licensed drivers in Pennsylvania and to definitely establish the periodicity of examinations. In fact, we estimate that at the rate of 15,000 examinations per week, it will take 7½ years to cover all of Pennsylvania's drivers.

The medical standards to be used were condensed into categories or disqualifying groups and listed on IBM punchcards for the purposes of simplicity, identity, and ease of mailing, filing, and tabulating. As listed on the card, disqualifying factors include the loss of use of both hands; 20/70 vision or less in the better eye with correction; neurological and neuropsychiatric disorders that prevent responsible control of a motor vehicle; any cardiovascular disorder, including hypertension, that prevents responsible control of a motor vehicle; conditions causing lapses of consciousness, such as epilepsy, narcolepsy, and hysteria (the individual may be considered for licensure if episode free for 2 years with or without medication); alcoholism; addiction to narcotics; and uncontrolled diabetes.

Since the Pennsylvania State police force has been responsible for giving visual acuity tests for many years and is equipped with instruments and testing areas, it was decided that the State police should continue to test for visual acuity and also for the loss of use of both hands. Thus, the person to be tested first takes these two tests from a State policeman and then takes his testing card to a physician of his choice. He is encouraged to visit his family physician for this purpose, since for some conditions, the medical history is a pertinent factor. The physician then mails the completed form directly to the bureau of traffic safety of the department of revenue.

Prior to the initiation of the physical exami-

nation program for drivers, the State health department supplied each physician in Pennsylvania with a copy of the American Medical Association pamphlet "Medical Guide for Physicians in Determining Fitness To Drive a Motor Vehicle," as well as a short guide showing how to complete the examination form.

First Year of Operation

As of June 1, 1961, the program had been in operation for a year. Like other large new programs, this one started slowly and had a few difficulties at the beginning, but it gradually gained momentum. Since the State police have a limited number of persons and facilities for the examinations, it was decided that for the first 6 months only those applying for new drivers' licenses would be examined. The next group to be included were to have been drivers licensed before 1924, a time when no examination whatsoever was required for obtaining a license, but a flood in 1936 in Harrisburg had destroyed or ruined so many records that this was not possible. Consequently, since the beginning of 1961, drivers have been selected at random for examination. In addition, all persons driving automobiles on State business have been required to be examined.

The physicians of Pennsylvania have cooperated extensively in promoting this program. At first, there was some fear on the part of a number of physicians about their legal liability in case an individual who had been examined had an injury-causing accident. However, the State's attorney general has quieted the fears by an opinion stating that the physician's responsibility for the condition of the individual applied only to the individual's condition at the time of the examination and to those elements included in the examination. Also, the legal department of the American Medical Association has stated that for the physician to be held liable, it is necessary to show: (a) he was guilty of negligence in conducting the examination or in reporting his findings to the State; (b) the negligent act was the primary cause of injury or accident; and (c) damages resulting from the negligence were foreseeable, since an injury which cannot be foreseen or reasonably anticipated as the result

of negligence is not actionable. Furthermore, the secretary of revenue decides, on the basis of information forwarded to him, whether an individual's driving permit is to be renewed, limited, suspended, or revoked, so that the legal decision does not rest with the physician doing the examination.

Borderline cases received by the bureau of highway safety are referred to the physician working full time on traffic epidemiology in the department of health for opinions as to the categories in which applicants should be placed. One of the most striking observations that the physician has made from these reviews is that many applicants with severe, possibly dangerous, physical conditions seem to have a complete disregard for or unawareness of the possible consequences of operating a motor vehicle under these conditions. In addition to completing the physical examination form, hundreds of physicians have written clinical summaries; this is extremely helpful in making the decision between approval and rejection.

Out of 421,857 drivers and applicants for drivers' licenses who were examined during the first year of the program, 602, or 0.14 percent, were rejected for disabilities discovered by the examinations (table 1). The percentage of rejections will probably be higher in the future, since the first half of the year was devoted to examinations of applicants with learner's permits, and these persons were mostly 16 to 20

Table 1. Drivers and applicants for drivers' licenses taking the required medical examinations and number and percent rejected for disabilities, by age group, Pennsylvania, June 1, 1960, to June 1, 1961

Age (years)	Drivers and applicants		Rejected	
	Number	Percent of total group	Number	Percent of age group
All ages.....	421, 857	100. 0	602	0. 14
16-20.....	151, 857	36. 0	108	. 07
21-30.....	70, 340	16. 7	37	. 05
31-40.....	69, 970	16. 6	59	. 08
41-50.....	55, 351	13. 1	56	. 10
51-60.....	43, 949	10. 4	53	. 12
61-93.....	30, 327	7. 2	239	. 79
Not stated.....	63	-----	50	-----

years old. As would be expected, the older the age group, the higher the percentage of failure. This is most noticeable in the age group 61 years and over, in which 0.79 percent of applicants were rejected. The oldest person to apply for a new license was 91 years old, and he received his license. Of the total number of applicants examined, 58 percent were men and 42 percent women. Eyeglasses must be worn while driving by 151,135 of those examined, or approximately 36 percent.

Table 2 presents the reasons for the 602 rejections. There were 613 instances of disqualifying conditions, some individuals having more than one such condition. The largest single category comprised those who withdrew voluntarily because they felt they would not be able to pass the examination. Next in order of magnitude is the group with severe cardiac or circulatory disorders; the third largest group had conditions causing repeated lapses of consciousness. For the purposes of this table, uncontrolled epilepsy is singled out from other conditions causing lapses of consciousness.

Nearly three-fourths of those rejected were

Table 2. Disqualifying conditions of 602 drivers and applicants for drivers' licenses who failed the required medical examination for drivers, Pennsylvania, June 1, 1960, to June 1, 1961

Disqualifying condition	Number of cases
Loss of use of both hands.....	3
20/70 vision or less in better eye, with correction.....	61
Neurological disorders, such as to prevent responsible control of a motor vehicle.....	68
Any cardiac or circulatory disorder, including hypertension, such as to prevent responsible control of a motor vehicle.....	97
Neuropsychiatric disorders, such as to prevent responsible control of a motor vehicle.....	42
Conditions causing repeated lapses of consciousness.....	79
Alcoholism.....	31
Narcotic addiction.....	4
Uncontrolled diabetes.....	25
Uncontrolled epilepsy.....	15
Lacks intellectual maturity.....	8
Doctor stated applicant unfit.....	47
Voluntary withdrawals.....	133
Total.....	1 613

¹ Some persons had more than one disqualifying condition.

men. Not only were a greater number of men examined (58 percent of the total), but cardiac disorders and, according to available data, alcoholism and narcotic addiction are more prevalent among men than women.

Besides the 133 voluntary withdrawals, 978 drivers scheduled for examinations did not take them. A survey of this group disclosed that 130, or approximately 13 percent, did not take the examinations for the following reasons:

Reasons pertaining to eyes.....	Number
Need glasses.....	10
Eyes failing because of cataracts and other conditions.....	23
Afraid to take eye examination.....	1
Hard of hearing.....	1
Heart condition.....	6
Felt unfit to drive because of old age.....	40
Physically unfit to drive (diabetes, stroke, nervous).....	39
Doctor stated applicant unfit.....	6
Afraid to take physical examination.....	4
Total.....	130

These 130 persons, unlike the 133 voluntary withdrawals, had made no effort to report their reasons for not taking the examination. The two groups together made a total of 263 persons who did not take the examination because of their own diagnoses of physical incapacity as defined by criteria set up for the examinations. In the group of 130, the 10 who needed glasses were informed that should they be able to pass the eye examination, they could renew their licenses, and the individual who was hard of hearing was told that this was not a criterion for rejection. Included among the 978 who did not take the examination were 315 who had moved out of the State. If these 315 are disregarded, the percentage of individuals who failed to take the examination because they felt they would not pass and who did not report withdrawal before the time of the survey rises to 19.6 percent.

Discussion

The percentage of rejections (0.14 percent) encountered among the 421,857 persons examined during the first year of the program indicates that not many persons are losing their driving privilege because of the examination

requirement. We feel that a driving license is a privilege. In some respects it might be considered a right, but one individual's right ends where another's begins. Because of society's right to determine how licensures will be granted to individuals, the term "privilege" seems the best one to use.

Case histories in Pennsylvania and elsewhere have shown that individuals with disorders that now disqualify a person for a driver's license in Pennsylvania can be dangerous drivers. Without more specific research data of the kind obtained in studies by McFarland in Boston (2), Goldberg in Sweden (3), Popham in Toronto (4), and McCarroll and Haddon in New York City (5), we cannot adequately estimate the number of severe or fatal accidents that will be prevented by removing drivers with certain disorders from the highways. However, the "functional approach," as it is called by the Pennsylvania Medical Society's committee, seems to be justified and reasonable.

This approach justifies many traffic accident prevention measures and many public health measures. The number of deaths or disabilities prevented by a traffic light at a given corner, by an unbroken white line in the middle of the road on a given hill, by the installation of a sewage treatment plant, or by an air pollution abatement program cannot be well documented. However, because of what we know from case histories and, in some instances, from years of experience (which would not have been attained if dependence on definitive cause and effect research data had been allowed to delay application), we continue to vigorously encourage and support these preventive measures.

We hope that the medical examination program in Pennsylvania will provide information useful to other parts of the nation in their evaluation of this accident prevention measure. We believe that as the general public becomes more aware of the gravity of the problem, they will turn increasingly to their physicians for advice and assistance in this matter. Although it is not always easy for the physician to make decisions in this regard, we hope more and more of them will accept this responsibility as part of their duty and will realize how vital to the prevention of serious traffic accidents is a critical evaluation of the driver's health.

Much more detailed consideration needs to be given to the age factor in traffic accidents involving drivers with handicapping conditions. Major chronic disability increases considerably among persons as they get older. Pennsylvania has not yet completely decided on the intervals or ages at which individuals will be examined, but this matter must be faced seriously and a decision made before long.

An important added benefit of the examination program is the uncovering of a number of cases of heart disease and other chronic diseases and conditions, often unknown to the persons involved. Such cases are being found on a rather large scale, and persons with these conditions are able to seek treatment earlier because of the examinations.

A study project has recently been started to evaluate the validity of the often-made "highway diagnosis" of heart attack as a cause of fatal traffic accidents. All accident reports in the State bearing such information are sent to the section of traffic epidemiology of the department of health. The information is checked against the official death certificates. In each case the coroner having jurisdiction is asked to outline his reasons for the diagnosis. Such requests are also made to the one medical examiner in Pennsylvania, in the city of Philadelphia. The family physician is contacted to determine whether the individual was under treatment for cardiac disease. Pertinent information is also obtained from the individual's family. In 1960, 45 persons died of alleged heart attacks on Pennsylvania highways while operating a motor vehicle. One coroner has stated, "From my 28 years of experience as coroner, I feel many fatalities are due to unknown and untreated cardiac conditions and not to blackouts." Before long we shall be able to present some statistical data that will relate to the accuracy of such an observation.

The Governor's Traffic Safety Council, the commissioner of traffic safety, and the department of health feel that a further constructive step in traffic safety would be to require drivers of taxicabs, buses, trucks, and other commercial vehicles to have a more frequent and a more rigid physical examination than the one currently being given to all drivers.

Of the 13 points in the traffic safety program

initiated in February 1960, the only one other than the medical examination program that might be considered to be in the health field is an educational program to encourage adoption of chemical testing for drivers suspected of alcohol intoxication. A survey was taken by the State police to determine the attitude of judges and district attorneys in the 67 counties of the State on this matter. In 55 counties there was favorable reaction to chemical testing, but in the remaining 12 counties the authorities surveyed were either indifferent or against chemical testing. In 1961, the Pennsylvania legislature passed a statewide chemical testing law. The law states that a blood alcohol concentration of 0.15 percent or greater by weight will be considered presumptive of intoxication; the consent of the driver must be obtained before testing is done. The original bill had recommended that a blood alcohol concentration of 0.10 percent or greater be considered evidence of intoxication and that chemical testing have the "implied consent" of drivers.

Summary

Since human behavior seems to be the most important factor in causing traffic accidents, physicians and health departments should play a major role in helping reduce traffic mortality and morbidity by focusing their time and efforts toward solving the problems of the physical and mental behavioral components that lead to accidents.

In Pennsylvania, one point of a 13-point traffic safety program announced by the Governor in February 1960 was a program of required periodic medical examinations for all drivers. The program was put into operation in June 1960 after 3 years of preparation. The Pennsylvania Medical Society, the Pennsylvania State Department of Health, and the Governor's Traffic Safety Council worked together to devise a program of driver examination that would remove drivers who, by reason of severe handicaps, could be considered dangerous drivers.

Of 421,857 persons examined during the first year, June 1, 1960, to June 1, 1961, 602, or 0.14

percent, were rejected as being unfit to drive, according to the established criteria. The percentage of failures by age group ranged from 0.05 percent in the 21-30 age group to 0.79 percent in the 61-and-over age group. The 602 persons rejected included 133 who voluntarily surrendered their licenses because they felt they would be unable to pass the examination.

Cases of heart disease and other chronic diseases and conditions are being discovered through the mass examination of drivers and potential drivers. Individuals with these conditions are thus enabled to receive earlier treatment than would have been possible without the examination program.

Individuals will receive medical examinations on a periodic basis, but the intervals have not yet been determined. The medical society has recommended that examinations be repeated at 10-year intervals to age 60 and at 5-year intervals thereafter because of the marked increase in severe chronic disabilities in the older age groups.

It would seem desirable for drivers who spend much of their time on the road as commercial drivers of such vehicles as taxicabs, buses, and trucks to have a more frequent and a more rigid physical examination than the one now required of all drivers.

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