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Education and Training in Civil Aviation Medicine

BRUCE V. LEAMER, M.D.

EDUCATION, to the majority of Americans, is neither glamorous nor provocative. It is something most of us endure in grade school, high school and college. When we finally get to medical school, we at last appreciate the value of the education forced on us in earlier years. We begin to anticipate the rewards that await us when we become one of the select group of physicians and surgeons. The long hours of study in medicine, in physiology, in surgical anatomy, and in the clinics are a pleasure. We make every effort to learn the best methods of diagnosis and treatment, the perceptions of the diagnostician, the finesse of the researcher, and the skill of the surgeon. After four years in medical school and one to four years as interns and residents, we begin to grow cool toward further formal education and are content to practice our profession and have a little recreation. We enjoy our general

practice or our specialty and relax a little after our strenuous "educational" years. We begin to enjoy life. Why spoil this pleasant way of living by talking about education?

We need to go back only a half century to the first flight of the Wright brothers. There was no necessity for physical evaluation of pilots then because there were only two pilots and no one knew what physical qualifications were required. The only requirements necessary, were that these two brothers had faith in their invention and had the determination to fly. Over the next thirty years, great improvements were made in the airplane. Speed and carrying capacity were increased and dependability was vastly improved. Also, more skill was required in handling these faster, passenger-carrying aircraft. During this period the need of special physical qualifications for pilots and aircrew became apparent. The Army Air Force (now the Air Force) and Navy Air Force established schools for the training of flight surgeons and flight examiners. The need for oxygen above certain altitudes was established and protection of the ears against engine

From the Department of Surgery, Division of Head and Neck Surgery, University of California Medical Center, Los Angeles, California.

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noise became necessary. Many research projects in the medical problems of flight were started. Pressure chambers, for the study of man's reaction to decreased atmospheric pressure, were built; human centrifuges, to study pilot reaction to centrifugal force and to changes in gravity, were developed.

As the speed and ceiling of the newly designed aircraft was increased, so were the physical stresses and demands on the pilot and aircrew increased. However, the physical standards for military and commercial pilots were changed very little during these years and the physical standards for private and student pilots remained the same.

The development of jet powered aircraft over the past twenty years has brought radical changes in speed and ceiling of passenger carrying aircraft; improved methods of cabin pressurization and heat control have been developed. Problems of oxygen supply and humidity control are gradually being overcome; physical standards for pilots and aircrew are being revised and stiffened. The Air Force and the Naval Schools of Aviation Medicine are constantly revising and improving their curricula to meet the educational demands imposed by the changes in the physical requirements.

As we advance into the space age there will be increasing medical, psychologic, and physiologic problems; new physical standards will evolve and further revision and improvement in the curricula of the military schools of aviation medicine will be necessary. We will have a continuing process of education and training.

Thus far, our discussion has dealt mainly with the military aspects of

aviation medicine. It is readily apparent that physicians who are privileged to attend the Air Force and Naval Schools of Aviation Medicine will be familiar with the various problems of aviation and space medicine. They will be fully qualified to decide whether pilots and aircrew meet the physical standards necessary to fly the high speed, high altitude, jet propelled and conventional aircraft.

CIVIL AVIATION MEDICAL PROBLEMS

What is being done in regard to the airline transport pilots, the commercial pilots, the private pilots, and student pilots? What is being done to keep the designated examiners and the undesignated Class III examiners informed as to the changes in physical standards for pilots and aircrew?

Every medical journal and every scientific journal carries notices of seminars and symposia pertaining to space medicine and the medical problems that may be encountered in the exploration of space. These meetings are intensely interesting and appealing to the imagination; they are of great value to the scientist and the research physician who is working in this field but they are of little practical value to the physician who examines the Class II and Class III candidates. This is the area with which we are concerned. This is also the area where the local and state medical societies and the AMA could be of tremendous help in sponsoring local meetings for the discussion and study of the problems of the down-to-earth aviation physical examiner.

During the past six months the Aerospace Medical Committee on Education and Training has contacted all of the state medical associations in the

United States in regard to their interest in aviation medicine. California, New York, Texas, Wisconsin, and several others indicated a definite interest in the subject. Some of the county societies have already established sections on aviation medicine. Members of the committee think that this matter should be pursued during the coming year and where any society evidences an interest, our organization should extend them the maximum of assistance.

If the local and state societies show interest in the problems of aviation medicine as they relate to aircrews, passenger comfort, safety, and educational programs for examiners, I am quite sure the AMA will show an even more active interest than it now manifests.

We know that commercial, passenger-carrying, air lines who employ flight surgeons generally have physicians originally trained by the Air Force, or Navy, at their schools of aviation medicine. These are Class I Examiners and they are given every opportunity to improve their knowledge and keep up with the latest developments in their field. Many of them are outstanding in their various specialties and relate these specialties to aviation medicine. These flight surgeons are especially designated as transport pilot examiners by FAA and are qualified to pass on the physical condition of the pilots and aircrews with their organizations, and to recommend corrective measures as necessary.

Those commercial air lines that do not regularly employ qualified flight surgeons are taking an unnecessary risk, in that some of their pilots and aircrew may not be physically qualified and should not be entrusted with the

safety of the air passenger. It is my carefully considered opinion that no airline should depend on other-than-qualified flight surgeons to conduct the physical examinations of pilots and aircrews. In view of the number of physicians who have gone through the Air Force and Naval Schools of Aviation Medicine, have completed their obligated military service and have returned to private practice, no airline, regardless of size, should have any difficulty in finding and employing qualified flight surgeons to conduct their physical examinations.

The private pilot and the student pilot usually receive their examinations from a physician who is not designated as an examiner by the Federal Aviation Agency (FAA). Although these physicians are conscientious and well thought of in their communities, they do not as a rule, have any specialized training in conducting flight physical examinations. They are very apt to pass over or ignore defects that might keep the private pilot from flying or the student pilot from learning to fly. When we study the accident rates and the mortality figures we are astounded at the number of accidents and fatalities that occur among private and student pilots. Perhaps many of these accidents were due to mechanical problems, but I am sure that many more were due to improperly certified pilots who had physical defects that were not considered in issuing their certificates of physical qualification. Private pilots and student pilots in private planes make up the majority of air traffic in localized areas and those who are allowed to fly without the proper physical qualifications are a menace to the lives of all those flying, to the population on the ground, and to themselves.

The following figures are of particular interest in regard to the users of air space: (1) Airlines—1,900 airplanes or 1.7 per cent of the estimated 109,500 planes that use the air space, accounting for 16.2 per cent of the total hours in the air; (2) Military—37,000 planes; (3) General aviation (includes private and industrial users)—70,600 or 69.5 per cent of the planes and accounting for 44.9 per cent hours in the air. Twenty years ago there were less than 30,000 aircraft using the 3,020,000 square miles of air space over the United States and flying at approximately 150 miles per hour. Today we have an estimated 109,500 planes, many developing speeds of 600 miles per hour and better. How many of the pilots flying the 70,600 general-aviation-use planes hold more than a Class III Certificate? These are the pilots who need to have as rigid an examination for flying as can be made.¹

DISCUSSION

Our educational program for Civil Aviation Medicine should start by requiring that *all* aviation examiners be designated as such by the FAA. It should be required that not only Class I and Class II pilots and aircrew be examined by designated examiners but that private pilots and student pilots (the Class III group) be examined by designated examiners. FAA has already stepped up the accreditation and designation of examiners for Class I and Class II. If the recommendation that Class III examiners be designated by FAA is adopted, it will mean that there will of necessity, be a rapid acceleration of the designation program.*

*Regulations of the Administrator, Federal Aviation Agency, Part 406, Amendment 13, effective June 15, 1960, require *all* applicants for airman medical certificates to be examined by designated medical examiners.

This will mean that refresher courses must be made available to the physicians throughout the country who wish to be designated.

At this time, only Ohio State University and the University of California at Los Angeles offer refresher courses of value to the aviation examiner. The University of Southern California offers several courses in aviation physiology and safety, but none are directly applicable to the needs of the examiner.

It is suggested that FAA, Civil Aviation Medical Association (CAMA), and Aerospace Medical Association (ASMA) sponsor one-day and two-day courses in various locations, based on physical requirements and examinations necessary to qualify pilots in Classes II and III. The need of certain physical requirements should be outlined and discussed. The reason for listing certain conditions as disqualifying should also be outlined and discussed.

Such an educational program for the civilian aviation medical examiner would result in well-trained examiners, would gradually eliminate the unfit from flying and would increase the safety factor for all concerned with aviation.

In the last paragraph, I referred to the examiners for Class II and Class III airmen. What of the examination of airline transport pilots now conducted by specially designated examiners? It is my belief that these examiners should be board qualified as rapidly as possible. The School of Public Health at Harvard University and the School of Public Health at Ohio State University offer courses and residencies that will qualify the candidate for admission to the board examinations and for certification in

aviation medicine. These board certified flight surgeons should be the leaders in civilian aviation medicine. Through their specialized knowledge in the field they should set up physical standards for jet pilots and aircrews, for the aircrews of conventional aircraft and for private and student pilots. These requirements and standards should be taught to all designated examiners and should be reviewed at regular intervals at seminars and short courses sponsored by FAA, CAMA, and ASMA and conducted in various parts of the country. As mentioned earlier, local and state medical associations and the AMA should take an active interest and lend assistance to the FAA, CAMA and ASMA in sponsoring such courses. Each one of us, as members of our local, state and national medical associations, could become a powerful factor in stimulating the interest of our medical groups in this very essential and important educational program for aviation medical examiners.

Our medical schools would be the logical place for the beginning of education in the basic factors of aviation medicine. Admittedly, the medical school curriculum is overcrowded. However, many of the courses now given have a direct relationship to

aviation medicine, for example, physiology, pharmacology, toxicology, cardiology, ophthalmology, otolaryngology, and so forth. The mere mention of the fact that knowledge of these courses is of value in aviation medicine would make the medical student aware of the existence of this specialty in the medical field.

SUMMARY

Since my subject is education and training in civil aviation medicine, I have not mentioned space medicine. Our most immediate problem is the education and training of the physician in practice who is interested in aviation, who is concerned with the physical examinations of Class II and Class III airmen. We should immediately start a program requiring that all pilots be examined by designated examiners. We should immediately start a program of instruction for all physicians interested in qualifying as designated examiners and plan refresher courses and seminars so that all designated examiners can keep up to date on the physical requirements of all airmen.

REFERENCE

1. Air Transportation, Facts and Figures—1960. *Aviation Week and Space Technology*, 72:18 p. 85, 1960.

Cardiology

New evidence was offered that desk workers may be more susceptible to coronary artery disease than men whose work requires moderate or heavy physical activity. A Minnesota research team reviewed the Railroad Retirement Board records of approximately 43,000 clerks, 31,000 yardmen and 24,000 section men (all between the ages of forty to sixty-four), whose jobs require, respectively, light, moderate and heavy activity. Findings: age adjusted death rates from arteriosclerotic heart disease in this group during 1955 and 1956 were 5.76 per thousand for clerks, 3.87 for switchmen and 2.79 for section men.—HENRY L. TAYLOR (Minnesota University, Minneapolis)—From *MD*, November, 1960.