INTRODUCTION. It is generally accepted that apo B levels are a reliable predictor of cardiovascular risk disregarding pathological antecedents. This paper presents the results of a study that measured cholesterol, apo A and apo B plasma levels in otherwise healthy ground and flight workers. METHODS: Total cholesterol was determined by Abbott's enzymatic technique and apo A and B by Behring's nephelometric immunological method in 396 random workers and 300 astronauts. RESULTS: 35.40% males and 13.48% females were hypercholesterolemic, being 70% and 62% respectively considered high cardiovascular risk. 11% males and 4% females with normal cholesterol were also considered high risk, due both to high apo B and low apo A levels. CONCLUSIONS: Apo B should be determined in hyperpond and normal cholesterolemic workers when there are other associated factors (smoking, hypertension, diabetes) and/or safety related jobs (aercrew) in order to comply or not harrier therapies to prevent cardiovascular disease.

REGULATION AND ADAPTATION PROCESSES OF HUMAN BODY IN LONG-TERM MICROLEVITY. A.I. Grigor'ev and A.D. Egorov. Institute of Biomedical Problems, Moscow 123077, USSR.

INTRODUCTION. Mechanisms of regulation and adaptation of cardiovascular, respiratory, muscular-skeletal, hematological and immune systems in microgravity are discussed in this paper. METHODS: Space flight medical investigation results are analyzed and summarized in terms of general physiological mechanisms. RESULTS: Minimally induced elimination of gravity-related dependencies is a significant characteristic of the human body structures. It is likely that the human body structures change differently in an unloading and modified microgravity environment. A number of short-term adaptation processes are changed and short- and long-term adaptation responses are developed; this is evidenced by the fact that a crew member's result in adaptive rearrangement of the functional state of the human body systems. The fluid shifts are accompanied by changes in regulation of circulation, water-salt metabolism, and motor activity. The reaction of the body to the unloading process is considered an important feature of the body response to microgravity. CONCLUSIONS: The human body structures which occur in microgravity result in the inactivation of the self-control and adaptive mechanisms, which in combination with the countermass measures complex, prevents further progression of disorders and to prevent disease.


INTRODUCTION. Bone loss following spaceflight is well documented, and if left untreated by rational countermeasures could limit manned space exploration. Many consider the loss of bone to occur over long periods, months to years, but the relationship between bone and blood calcium homeostasis allows us to study this problem within the first 48 hours of spaceflight. We hypothesized that the initial response of bone to unloading will be a release of calcium, through increased bone mineralization and mobilization of calcium stores, the fluid shifts are accompaniment changes in circulation, water-salt metabolism and motor activity. The reaction of the body to the unloading process is considered an important feature of the body response to microgravity. CONCLUSIONS: The human body structures which occur in microgravity result in the inactivation of the self-control and adaptive mechanisms, which in combination with the countermass measures complex, prevents further progression of disorders and to prevent disease.


INTRODUCTION. The USSR experience, having been accumulated in LDSF medical support, has shown the necessity of the definite correction and specification of methodology of MCS design. METHODS: By use of systemic analysis, the definite estimation of the results of MCS in space has been performed. There have been analyzed the results of examination of 19 Soviet cosmonauts, who performed LDSF, lasting from 2 to 12 months, in 1980-89. The analogous estimation has been carried out in 556 experiments with volunteers during the modelling of orbital space environment. RESULTS: The systemic analysis has shown, that in addition to 3 well-known methodological principles (i.e. pathogenesis, "MC by stages" and succession's ones), 4 new principles must be formulated and taken into account. They are: the systemic-structural approach, the determinism of the infrastructure of the basic physiologic methods, the notion of "total image" of MCS, the search of "organ-targets". CONCLUSION: The realization of all the formulated methodological principles leads to the significant improvement of the informative and diagnostic possibilities of on-board MCS in LDSF.

INTRODUCTIN. We presented lymphocytes increased in number and Natural killer (NK) cell activities increased after the transmeridian flight. The time difference may be two factors round trip, the number of lymphocytes and NK activities increased and its circadian rhythm had been disturbed by Day 5. In case of southbound round trip with 1 hour time difference, however, these factors were little affected. CONCLUSION. These results indicated that time difference after transmeridian flights induced the increased number of lymphocytes, the disturbance of circadian rhythm and the enhancement of NK cell activities.

THE SURGICAL PATHOLOGIST: A RESOURCE IN THE FLIGHT SURGEON'S MANAGEMENT OF FLYING PERSONNEL WITH NEOPLASMS. EM Deaver, Wilford Hall USAF Medical Center, Lackland AFB, TX 78236-S300.

Major gains in rates of cure and/or long term survival of patients with neoplasms have been made in the past 20 years. Increasing numbers of Air Force flying personnel are requesting waivers to return to flying status after treatment for a large variety of neoplasms. The surgical pathologist, by his role in diagnosing neoplasms and assessing response to therapy, is an important source of information for flight surgeons managing patients with neoplasms. Wilford Hall USAF Medical Center is a major referral center for flying personnel with neoplasms. In recent years, challenging cases are presented. There include the case of a pilot diagnosed with melanoma of a cryptorchid testis, and a case of a carcinomato treated with nephrectomy, a pilot treated with adenocarcinoma of the lung, a case of a pilot treated with recurrent myelogenous leukemia and a pit with a history of melanoma and prostate. The utility of consultation with the surgical pathologist will be discussed. Insights gained from analysis of the Wilford Hall Tumor Registry files involving flying personnel will be reviewed.
AIRPORT DISASTER PLAN IN TOKYO INTERNATIONAL AIRPORT.
E. KATSUKI* Tokyo International Airport Medical Office, 2-3-1 Hinokaido Koto-ku Tokyo 135, Japan

INTRODUCTION. It has already been reported in number of studies that about 85% of aircraft accidents occurred within 5 miles from airport. For this reason it is important to consider how to cope with such disasters. At the Tokyo International Airport (HNDRA) there has been a number of emergencies in the past year. In order to improve the treatment procedures the various organizations concerned referring to ICMA, or to the study of Dr. Schuk (HIR) and Dr. Boug (ORLM) and it was completed in April 1991. REHEAT. First report: This should be transmitted to various organizations and agencies concerned by cascade system. Emergency medical care should be done in all hospitals located near the airport so that casualties should be transported immediately after resuscitation at the site of accident. CONCLUSION. It is necessary that all personnel concerned to such hospitals only after treated for resuscitation at the site of accident.

THE EFFICACY OF BIOGRAPHICAL INVENTORY DATA IN PREDICTING EARLY ATM ETRICTION IN NAVAL AVIATION OFFICER CANDIDATE TRAINING. AL R. Street and D. L. Dolan*, Naval Aerospace Medical Research Laboratory Naval Air Station, Pensacola, Florida 32588-5700

INTRODUCTION. Early attrition in the training of U. S. Naval aviation Officer Candidates presents a historic problem with increasing implications in a time of service drawdown and budgetary constraints. This investigation assesses the value of Biographical Information, a sample of Aviation Officer Candidates and Naval Aviation Cadets in predicting early attrition at the indoctrination level of Naval Aviation Officer training. METHODS. A sample of 1659 Aviation Officer Candidates and Naval Aviation Cadets was used in the study. Two of the scorers re-rated 28% of the cadets and 18% of the candidates. Data were selected from the Early Attrition Screening Test (Fligh Aptitude Rating (AQT/FAR) between 1987 and 1991 and was selected for analysis. A principal component factor analysis of Biographical Inventory types of experience. RESULTS. General of JMA (N = 33) with 42 dead and 146 injured at offshore water. At this time we had confirmed the 18% of NCA with 42 dead and 146 injured at offshore water. At this time the disaster plan was not established yet, we had many trouble on the site, since we have we have made effort in cooperation of the various organizations concerned referring to ICMA or to the study of Dr. Schuk (HIR) and Dr. Boug (ORLM) and it was completed in April 1991. REHEAT. First report: This should be transmitted to various organizations and agencies concerned by cascade system. Emergency medical care should be done in all hospitals located near the airport so that casualties should be transported immediately after treated for resuscitation at the site of accident. CONCLUSION. It is necessary that all personnel concerned to such hospitals only after treated for resuscitation at the site of accident.

EXPECTATION AND PERFORMANCE OF STUDENT PILOTS AND INSTRUCTORS DURING INTRODUCTION TO THE F-5 AND THE F-16. L. Lian and H. T. Anderson*, RNoAF Institute of Aviation Medicine, P.O. Box 14, 0313 Oslo, Norway

INTRODUCTION. Young fighter-rated pilots, flying experience averaging 285 hours, are trained to achieve operational standards at the air force tactical school, first in the F-5, later on in the F-16. Trainees as well as instructors frequently express some degree of frustration during this period. Interviews with both groups of participants indicated that discrepancies between expectations, performances and achievements might explain their dissatisfaction. METHODS: A total of 87 trainees, including Cadets and Cadet instructors were selected from the training program. After briefing, immediately before leaving for flight line, students and instructors were asked to predict performance by putting a mark to a line 100 mm long. Likewise, on return before debrief, they were similarly asked to give their impressions of actual performance in the same way. RESULTS: Students and instructors alike on the initial course flying the F-5 exhibited too great expectations as compared to instructors final evaluation of performance. In the secondary course on the F-16 instructors still tended to overestimate the flying capabilities of their students, the latter group now showing rather modest expectations. Both instructor groups were consistent in their evaluations. However, instructors used a much wider range of the scale than did the students. All of the results are significant (p<0.02 or less) by statistical analyses. CONCLUSION: Frustration in early training may be due to discrepancies between expectations and performance among students and instructors.

REDUCING THE ATTRITION RATE IN NAVY ADVANCED FLIGHT TRAINING. D.J. Bluestone, Naval Aerospace Medical Research Laboratory, Pensacola, Florida 32508-5700

INTRODUCTION. The selection of naval aviators can be improved by using tests that sample some of the information processing and psychomotor skills thought to underlie successful performance in flight training. Predicting students who have a higher probability of failure in the advanced phase of flight training is important because a failure at this stage can cost over $12000 per student. METHODS. Discriminant analysis was applied to the scores from all the tests and found that these data were selected from the Early Attrition Screening Test (Flight Aptitude Rating (AQT/FAR) between 1987 and 1991 and was selected for analysis. A principal component factor analysis of Biographical Inventory types of experience. RESULTS. General of JMA (N = 33) with 42 dead and 146 injured at offshore water. At this time the disaster plan was not established yet, we had many trouble on the site, since we have we have made effort in cooperation of the various organizations concerned referring to ICMA or to the study of Dr. Schuk (HIR) and Dr. Boug (ORLM) and it was completed in April 1991. REHEAT. First report: This should be transmitted to various organizations and agencies concerned by cascade system. Emergency medical care should be done in all hospitals located near the airport so that casualties should be transported immediately after treated for resuscitation at the site of accident. CONCLUSION. It is necessary that all personnel concerned to such hospitals only after treated for resuscitation at the site of accident.


INTRODUCTION. Aviators generally require neuropsychological assessment when there is evidence of neurological or psychiatric conditions, or when there is evidence of deterioration in their performance in aviation-related skills: COGSCREEN, a computerized cognitive screening test in development by FAA, is being selectively applied as an adjunct tool during such evaluations. METHODS. Nine commercial aviators (7 Pilots and 2 Flight Engineers) who had been referred for neuropsychological assessment were administered a traditional Halstead-Reitan based test battery (34 hours) as well as the computerized test battery (54 minutes). RESULTS. On COGSCREEN the aircraft and basic flight students exhibited too great expectations as compared to instructors final evaluation of performance. In the secondary course on the F-16 instructors still tended to overestimate the flying capabilities of their students, the latter group now showing rather modest expectations. Both instructor groups were consistent in their evaluations. However, instructors used a much wider range of the scale than did the students. All of the results are significant (p<0.02 or less) by statistical analyses. CONCLUSION: Frustration in early training may be due to discrepancies between expectations and performance among students and instructors.

PERFORMANCE OF TERMINAL AIR TRAFFIC CONTROL SPECIALISTS IN FIELD QUALIFICATION TRAINING. G. A. Manning* and Wayne L. McMillin, FAA Civil Aeronautical, Oklahoma City, OK 73125.

INTRODUCTION. Most studies of the Federal Aviation Administration's (FAA's) Air Traffic Control Specialists (ATCSs) focused on the on route option. Training of terminal ATCSs focuses on the en route option. Early attrition in the training of U. S. Naval aviation Officer Candidates presents a historic problem with increasing implications in a time of service drawdown and budgetary constraints. This investigation assesses the value of Biographical Information, a sample of Aviation Officer Candidates and Naval Aviation Cadets in predicting early attrition at the indoctrination level of Naval Aviation Officer training. METHODS. A sample of 1659 Aviation Officer Candidates and Naval Aviation Cadets was used in the study. Two of the scorers re-rated 28% of the cadets and 18% of the candidates. Data were selected from the Early Attrition Screening Test (Flight Aptitude Rating (AQT/FAR) between 1987 and 1991 and was selected for analysis. A principal component factor analysis of Biographical Inventory types of experience. RESULTS. General of JMA (N = 33) with 42 dead and 146 injured at offshore water. At this time the disaster plan was not established yet, we had many trouble on the site, since we have we have made effort in cooperation of the various organizations concerned referring to ICMA or to the study of Dr. Schuk (HIR) and Dr. Boug (ORLM) and it was completed in April 1991. REHEAT. First report: This should be transmitted to various organizations and agencies concerned by cascade system. Emergency medical care should be done in all hospitals located near the airport so that casualties should be transported immediately after treated for resuscitation at the site of accident. CONCLUSION. It is necessary that all personnel concerned to such hospitals only after treated for resuscitation at the site of accident.
INTRODUCTION. The present study was conducted to evaluate the prevalence of NIDDM among cockpit crews and to analyze the present status of individuals with NIDDM and impaired glucose tolerance (IGT). METHODS. A total of 1263 active crews age ranging 40-60 yrs are included in the study. All received annual medical examination every 6 month since employment and those who showed urine glucose > trace and/or fasting plasma glucose (FPG) > 100 mg/dl took 75gOGTT. Abnormal result's were repeated after 3-31-91, laboratory variables were measured to determine their control status. RESULTS. Of 1263, 43 were diagnosed as NIDDM, 192 as IGT, 10 as renal glucose uria and the remaining 1018 were normal. Prevalence rate of NIDDM was 3.4%. A cross sectional study demonstrated that present age (52.9, 49.2 ± 46.8 yrs), FPG (107, 104 vs 92 mg/dl), HbAlc (6.1, 5.8 vs 5.5%) were higher in NIDDM and IGT than in normals, however, BMI, T.chol and uric acid levels were identical among three groups. None of them were grounded due to poor control of diabetes. CONCLUSION. The occurrence of NIDDM among cockpit crews was approximately 1/3 of general population despite their irregular and stressful life style. Healthy worker's effect among cockpit crews was approximately 1/3 of general population.

RESULTS. Although the Soviet flights were of shorter duration than expected this missions, evidence exists that the deceleration of DNIF is long - mean 3.1 weeks in the initial survey; 30 days in the follow-up. Seven cases of significant morbidity temporally related to centrifuge training are presented.

INTRODUCTION. As tactical aviation moves far, beyond the current G envelope. Research exposures to high-G environments, e.g. aircrew centrifuge training, pose a health hazard. Retention of the current G tolerance limits used by various investigators the goal of this study was to determine the most appropriate level for this limit. METHODS. Since previous U.S. spaceflights have been limited to 5-6 g for 2 days duration, Soviet flight results were examined. Published details of Soviet entry trajectories were not available. However, personal communication with Soviet cosmonauts suggested that peak entry loads of 5-6 g had been encountered upon return from 8-9 days in orbit. Soyuz entry capsule characteristics were estimated. The peak deceleration load allowed for aero-braking of manned vehicles is a critical parameter in planning future excursions to Mars. However, considerable variation exists in the limits used by various investigators. The goal of this study was to determine the most appropriate level for this limit.

RESULTS. The utility of and need for enforcement of standard operating procedures (i.e. mask on, helmet secured, and at lower ejection speeds) Related injuries were minor and occurred in only 20%. CONCLUSION. The utility of and need for enforcement of standard operating procedures (i.e. mask on, helmet secured, and at lower ejection speeds) Related injuries were minor and occurred in only 20%.