INTRODUCTION

This chapter discusses issues in psychiatry and psychology that are unique to aerospace medicine, including psychiatric disease in the aviator, selection of aircrew, fear of flying, the personality of the successful aviator, and the role of the aviation psychologist. Issues not emphasized in the usual psychiatry or psychology text, specifically airsickness, combat stress, aircrew fatigue management, prisoner-of-war experiences, and sequelae of aviation mishaps are also addressed in this chapter. Other issues in psychiatry and psychology, which are not fundamentally different from those encountered in everyday civilian and military practice, are not addressed in this chapter but are dealt with in many widely available textbooks. For example, all current diagnoses are formulated and recorded according to observable and measurable definitions, avoiding any theoretical model in the Diagnostic and Statistical Manual IV (DSM-IV) (16). Psychiatric interview technique is discussed in most basic texts, such as the volume by McKinnon and Michels (44). Emergency psychiatry, including diagnosis and treatment, is covered in multiple guides and handbooks including Hyman's text (28). Several overall summaries, reference books, and student introductory texts are widely available, such as Kaplan and Sadock's Comprehensive Textbook of Psychiatry (35), and a volume by Talbott (59). Kaplan and Sadock discuss military psychiatry, but not specifically aviation, in chapter 44 (33). An earlier tome by Kaplan, Freedman and Sadock (34) has both a military chapter (No. 46.1) and an aerospace chapter (No. 46.2) in volume 3.

A pertinent synopsis of Aerospace psychiatry, psychology and neurology including remarks about therapy/disposition, underlying philosophy, and a discussion of specific aeromedical topics, is found in chapter 17 of Fundamentals of Aerospace Medicine (14) and the NATO-AGARD Symposium (51). Much more dated, but fundamentally sound, information is contained in chapters by Randel (54) and Dhenin (15). The US Naval Flight Surgeon's Manual covers psychiatry at some length with particular attention to prisoner-of-war and repatriation experiences (64).

In addition to assistance through the references, formal consultation or informal discussion is available with the base psychiatrist or psychologist, a number of whom have aviation expertise. When the base psychiatrist or psychologist does not have aviation expertise, the flight surgeon should make requests of the base mental health office with specific questions such as: "Is this
individual's depression resolved such that he or she is able to resume flying duties pursuant to regulations “(1). Another question might be: “Please comment specifically upon suicide risk, both present and future,” rather than: "Please evaluate.” Similarly, the Neuropsychiatry Branch of the Aeromedical Consultation Service, Brooks AFB, Texas is available telephonically at DSN 240-3537 during duty hours for consultation and advice regarding therapy and aeromedical disposition. Whichever route of consultation the flight surgeon chooses, the provider should not hesitate to obtain a specialist's advice in this field where superficial appearances are often deceiving and the mental health of aviators is particularly difficult to evaluate.

PSYCHIATRIC DISORDERS

A seven-year retrospective review of psychiatric hospitalizations in aviators and their subsequent rates of return to flying status was conducted for 1986 to 1992. This study revealed that from a population of over 35,000 USAF rated aviation officers on flying status, 214 were hospitalized for psychiatric diagnosis. The largest percentage (56.5%) of the psychiatric inpatient stays were secondary to alcohol. This finding suggests that alcoholism is a mental health concern in this population. Returning to flying status was not precluded by alcohol treatment, as 70.2% of these aircrew returned to fly. Within the group of aviators who did not return to fly, there were more cases of psychosis and affective disorders. Although permanent grounding for psychosis makes sense, loss of valuable aviators to affective disorders, especially depression, may be averted by early diagnosis and appropriate treatment. Seventy percent of depressed aviators evaluated at the Aeromedical Consultation Service (ACS) from 1991-1994 were recommended for return to flying status. Overall, the study found that 65.9% of the psychiatrically hospitalized aviators were returned to flying status over the seven-year study period. This surprising finding is very encouraging for a group who fear contact with mental health professionals. Thus, preventative interventions for alcoholism and depression in this population could significantly decrease the loss of experienced aviators (20).

A study (22) looking specifically at aviator alcoholism addressed the treatment of alcoholism in a population of airline pilots. The authors found that early identification and treatment of the substance-abusing aviator can be enhanced by encouraging teamwork between pilots, the union, management, and flight surgeons. In the program analyzed, 87% of the treated alcoholic pilots returned to flight duties and the rate of relapse was only 13%. The job-based, peer-oriented alcohol treatment was not only successful but contributed to pilot retention.

A third study, presented by Drs. Patterson, Sipes, and Marsh at the Aerospace Medical Association (AsMA) meeting in 1993, reviewed the recent 10 years of ACS referred mental health evaluations. It found that most were referred for psychological aspects of medical complaints (35%), followed by anxiety (18%), depression (14%), acute adjustment problems (13%) and marital discord (11%). Most were recommended for return to flying status (77%) and most others were recommended for return to flying after treatment (21%). Somatization, depression, and alcohol treatment failures (2%) were recommended for permanent disqualification. As cited
earlier in the discussion of the seven-year retrospective review of the hospitalizations of aviators, return to flying status after alcohol treatment was much higher than the ten-year study at ACS would suggest. This discrepancy is due to most waivers for alcoholism being given at the Major Command level. The presenters at the AsMA meeting concluded that early evaluation and treatment result in the best outcome and earliest return to flying.

AIRCREW SELECTION

Appropriate selection of pilots and other aircrew attempts to reduce training costs and improve flight safety. Selection has historically rested on three areas: a.) psychomotor, psychological, and other related tests; b.) the physical examination; and c.) assessment of mental health and motivation. The flight surgeon performed the latter two assessments, the former was done by others, and those results remained unknown to the flight surgeon. Studies have shown that of 1,000 flight applicants, 500 were rejected for physical disorders and another 250 for psychological conditions; 100 had training failures, and 150 applicants graduated.

From 1942 through 1955, psychomotor testing of the candidate was performed utilizing electromechanical apparatus. In 1955, this was discontinued, due to difficulty in calibrating the machinery and problems with reliability between different examining stations, and replaced with an entirely paper-and-pencil test, the Air Force Officer Qualification Test (AFOQT). Subsequently, a computer-based test battery was devised which attempted to reproduce the early psychomotor testing but without the quality control problems. The physical examination is rather straightforward with the specific parameters delineated in the physical standards regulation.

The assessment of the mental health and motivation of the candidate is more ambiguous than the assessment of the physical status. In response to the great losses early in World War I, 90% of which were due to other than enemy action or mechanical failure, efforts to develop physical and mental standards of fitness were rushed forward with positive results. To better assess the mental health of prospective aviators, Maj. Longacre developed the Adaptability Rating for Military Aeronautics (ARMA) in 1930. While recommendations to improve the ARMA have been made, they have not been instituted. A survey published in 1993 outlined the current usage of the ARMA by flight surgeons. The investigators found that more flight surgeons were dissatisfied with the ARMA than were satisfied.

The flight surgeon administering the ARMA inquires about motivation to fly by asking whether the candidate has flown and how the person found that experience. If the individual hasn't flown, he or she is asked about how they think it will be. The candidate is asked about airsickness and the dangers of flying. The candidate is asked about motivation to fly and when the interest first started. How do parents and significant others feel about their flying? What will happen if they are not admitted to flight training? The flight surgeon inquires about the handling
of perceived stress, socialization and achievements. Athletic activities, disciplinary problems, drug or alcohol use, fights, and anger management are discussed (14 [chap. 17], 54, 45). Overall, there is no objective standard for reaching a conclusion, but in the absence of any grossly detectable psychopathology or deficient motivation, the ARMA is marked satisfactory. In 1992, only three applicants were eliminated on the basis of an unsatisfactory ARMA, thus this tool is infrequently used by flight surgeons to eliminate an applicant (36).

Along with the physical exam and the ARMA, psychological testing has been used to select pilots and other aircrew, to reduce training attrition and costs, as well as to improve flight safety.(15, 14 [chap. 13]). Using psychological testing to determine which applicants become successful USAF aviators has been attempted for years, showing modest scientific success, but dismal administrative acceptance. Times are changing due to economic necessity, and several recent projects represent state-of-the-art psychological investigation applied to aviator selection. The Neuropsychiatrically Enhanced Flight Screening (N-EFS) program was initiated in 1994 and has two objectives: 1.) obtaining psychological testing data from pilot applicants, correlating the data with the pilots successfully completing mission ready status in a USAF weapons system, and determining if these N-EFS tests can serve a predictive function; and, 2.) obtaining baseline intelligence and cognitive functioning data for future comparison, if necessitated by a subsequent medical condition in the pilot/pilot applicant.

The N-EFS program utilizes voluntary participants, at the commencement of pilot screening. Participants complete the commercially published Revised NEO Personality Inventory (NEO-PI-R), a gauge of normal personality functioning; the Multidimensional Aptitude Battery (MAB), a commercially published intelligence test; CogScreen, a computer-base neuropsychological screening test; and the Personal Characteristics Inventory (PCI), which is being developed to measure judgment and the potential for effective crew resource management. To meet the first N-EFS objective, participants are advised that follow-on interviews will occur two years into their particular airframe assignment, to correlate their testing data with their eventual performance. This differs from previous personality studies, which typically used completion of undergraduate pilot training as the criterion of pilot success, rather than mission readiness or performance in a weapons system aircraft. Short-term research in the training environment is frequently plagued by the "honey-moon effect" (i.e. subjects attempt to look their very best and can sustain a high level of performance in the short-term). Personality traits and other human factors have been recognized as a major contributor to UPT attrition and a major contributor to aircraft mishaps, and hence, represent a critical source of lost lives and flying resources. While previous studies have attempted to discern who can finish pilot training, scant information exists on who will finish pilot training and evolve into effective aviators. N-EFS should provide some of this data.

The second objective of N-EFS is to obtain individual baseline intelligence and cognitive functioning information for future comparison purposes in the event of a need for medical waiver consideration. CogScreen and MAB are administered for potential comparison purposes in case future neuropsychological evaluation is clinically indicated for medical waiver consideration (AFI 48-123, A6.23). The need for baseline assessment of aviators, who are at high risk for traumatic brain injury, has long been recognized as urgent. (ed. note: established cognitive baselines would
also help evaluate not only recovery from trauma, but also potential side effects of new medications and complications of disease and/or environment, e.g. viral encephalitis and prisoner of war repatriation). Traditional neuropsychological assessment is time consuming and can be subject to examiner experience and administrator-error artifacts. CogScreen, MicroCog, and the MAB are examples of new computer-administered cognitive screening instruments that are sensitive to nuances of cognitive functioning. Clinicians in the field may note pilots presenting themselves for evaluation and treatment who have overprinted SF600's in their medical chart indicating that they completed the MAB and the CogScreen (38) as a result of N-EFS screening.

Programs such as the Air National Guard Top Performer program (21) and the AFSOC Commando Look represent other examples of new efforts in aviator selection.

THE PILOT PERSONALITY

Understanding the typical strengths and vulnerabilities of most pilots can be a useful tool in rendering services to this extremely stressed population. It is useful to understand the strengths and vulnerabilities of this group because when things go wrong, the consequences can be severe. Because aviators are unconnected to their emotional lives, they will have few or no mechanisms to deal with failure (62). They are then likely to self-medicate, argue with their spouse, or convert their emotional conflicts to physical complaints and present these symptoms to the flight surgeon. Failure to recognize the failing aviator can ultimately result in a mishap that may have been preventable.

Tom Wolfe, in The Right Stuff (66), describes the "right stuff" as an amalgam of stamina, guts, fast neural synapses, and old fashioned hell raising. The popular media has saturated us with other books and movies that present profiles of pilots. Is there, however, just one type of pilot? Pilots are not clones of each other. Over-generalization and stereotyping of pilots and other fliers can be very misleading, and can be resented by aviators. Similar to snowflakes, no two pilots will ever be exactly the same. Fighter, test, and light attack pilots along with astronauts are the most frequently studied, at the expense of tanker/transport pilots, navigators, weapons officers, flight surgeons, and enlisted flying personnel. (19). Most times the information that applies to one group is extrapolated to the other groups regardless of the actual validity of doing so. Also, there are many different motivations for flying. So, attempting to understand the individual aviator requires avoiding preconceived notions or stereotyped, cookie-cutter caricatures.

Adequately cautioned, let us now look at the modal pilot. (Modal refers to the most frequently occurring). Dr. Frank Dully, a retired Navy flight surgeon, observed that the pilot is a controller who avoids what cannot be controlled at all costs. Situations are typically not entered into without there being a clear plan for egress or ejection. The concept of control is not limited to controlling an aircraft. Everything must be controlled including spouse, children, dog, car, and house. If the controller is not in control or can't at least pretend to be, he or she will be very irritable. Controllers hate surprises, so they practice, practice, and then practice some more. These individuals plan their spontaneity, so their emotions are handled similarly.

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Emotional distance from others is maintained at most times such that aviators have difficulty with intimacy in their marriages. Male pilots often list "communication" as deficient in their marriage and in need of improvement, or are completely unaware of any problems at all in their marriages and are taken by surprise when their wives leave them(55). On psychological testing, this group will typically score high in gregariousness but low in warmth; they are extroverted introverts. Remember, this group is high-achieving and it's difficult to nurture friendships while studying or otherwise striving to achieve. This group typically majored in science or engineering rather than liberal arts in college. Pilots have the ability to separate flying and nonflying-related issues so that they may be dealt with at the appropriate times. Pilots are mission-oriented compartmentalizers. If an issue is not connected to the mission at hand, it is ignored. It is no surprise that these individuals are unconnected to their emotional lives. Pilots are systematic and methodical. They rely on checklists and feedback. Their goal is to avoid surprises, so they are likely to appear inflexible or even rigid.

The contradictions in the psychological make-up of an individual pilot can make any concept of the "pilot personality" appear less valid. They have high intelligence but are not intellectually oriented. The average pilot IQ is 125 (95th percentile of the general population) but they are not likely to hang out in libraries. They can be team players, but they have anxiety in close relationships. They are likely to be gregarious and appear extroverted but in reality they are not particularly warm. They have many acquaintances but very few, if any, close friends. From a safety standpoint, they are very efficient. Safety is vulnerable to compromise, however, when something goes wrong in their ordinarily well-ordered lives, such as a child born with birth defects, marital problems, serious personal illness (whether or not a grounding condition), base closure, or loss of a flying job.

There is no one single pilot type. Recent attempts have identified at least three broad categories of pilots. The largest is the achievement-oriented, dominant, and affiliative type that takes a practical approach to problem solving. This subgroup tends to be level-headed and values officership and camaraderie. Another subgroup is similar to the first but tends to be more dominant, aggressive, exhibitionistic, and self-aggrandizing. The third and final subgroup is cautious, compulsive, and socially retiring. This subgroup tends to be the least socially affiliative or achievement-oriented. Research has demonstrated that membership in any of these groups does not strongly predict success or failure in military aviation (52), though the pilot who is equally technically proficient and interpersonally adept has been found to perform the best in the cockpit (26).

Understanding the vulnerabilities of aviators can be a useful tool in rendering services to this population. Know the pressure points for this group and beware when they start to self-medicate, argue with their spouse, or present themselves to the flight surgeon with physical problems that do not appear to have an organic basis. Flying satisfies their need for achievement, individual initiative, novelty, excitement, and responsibility. We don't know if the characteristics peculiar to the pilot are formed by the task, or if the job attracts people with these traits, or if both factors are operative. The generalizations about pilots may also be true of other professions.

Other studies have looked at the so-called strengths of pilot personalities (18, 19, 50, 54). These characteristics include such things as confidence, patience, strong motivation to fly,
maturity, achievement-oriented, responsible, direct, high intelligence, excellent physical health, good team players, desire for success, and other traits. On the whole, they are much more dominant and achieving than their nonflying counterparts. Mastery of complex skills is a primary issue with pilots (14 [chap. 17]). In addition to being competitive, dominant, and achieving, they must possess a fair degree of self-control and level-headedness in order to function within the highly structured military environment. Pilots are leaders and followers; that is, they function as part of a team and are expected to subordinate their own desires to complete the mission. Pilots tend to be seen as exhibitionists, confident and self-possessed, and more likely to seek thrills and risks. They pursue a dangerous and, in their own eyes, glamorous profession. While seen as conforming company individuals, pilots have a need for novelty and exciting stimulation.

The "normal" psychological pilot defenses are rationalization, intellectualization, and compartmentalization (19). With these three defenses and others, the pilot is able to handle the dangers of flying. While the first two are defense mechanisms seen in many individuals, the third is indicative of the aviator being a mission-oriented compartmentalizer (17). In the cockpit, the flier consciously uses compartmentalization as a system to exclude distractions while in control of an expensive and complicated airplane. Other compartments are excluded such as overdrawn bank accounts or a fight with the spouse.

When the pilot’s coping mechanisms are overwhelmed, the “failing aviator” syndrome may appear. The most common cause is a failing marriage. The spouse repeatedly faces stresses, burdens, and hardships not found in the families of individuals in other occupations, and many times faces them alone. Some marriages cannot survive. A pilot’s behavior patterns may change and he or she may feel out of control. The stresses at home soon overwhelm the pilot’s ability to successfully compartmentalize, and he or she ruminates. Red flags of the “failing aviator” syndrome include behaviors such as: increased risk taking, alcohol excess, speeding, alcohol-related vehicle tickets, marital conflicts, and automobile accidents, all of which can ultimately be followed by an aircraft accident. The destructive direction of this behavior pattern can be reversed by a respected individual. The intervention of pointing out the destructive pattern the individual is using to cope with the stressful situation may not immediately solve the family problems but may help. The ultimate goal is to keep an aviator healthy and productive (17).

Clinical duties of the flight surgeon require that the flight surgeon be able to assess the psychiatric status of patients, manage milder psychiatric cases, refer difficult psychiatric cases, and understand psychological factors operative in group dynamics. Because of the relationship the flight surgeon has with the squadron, he has numerous opportunities to observe and respond to psychological factors at work in the operational setting. Intervention in the clinical setting or in the operational setting is one of the roles of the flight surgeon in dealing with psychiatric stress and disease.

A study looking at “Top Performers” in F-16 aircraft demonstrated that pilots are notable for their lack of psychiatric illness and are intellectually very bright. It also found that aviators can agree who are the top performers in their squadron and what personal qualities are important in top performers (21). Another study demonstrated that psychological testing designed for clinical
patients may overestimate the magnitude of personality pathology in pilots, even when they have been clinically referred (36).

AEROSPACE CLINICAL PSYCHOLOGY

Aerospace clinical psychology is a special application of psychology to the hazardous and stressful environment of aviation. Services of an aerospace clinical psychologist are typically offered on a unit level but interventions can be tailored for individual aviators and their families. Aerospace clinical psychologists usually do not take direct referrals from commanders and instead, work closely with the flight surgeon’s office. Psychologists have unique skills to offer in the area of assessment, so be sure to consult with a psychologist if you’re responsible for physical exams and standards.

Like other members of an Aerospace Medicine team, aerospace clinical psychologists are concerned primarily with mission accomplishment. Obviously, such an approach goes directly against the traditional role of a "provider" or clinician and is therefore likely to be misunderstood and possibly even resented by traditional mental health providers. Traditional health care providers may assume that the psychologist is “coasting” during the time not spent in the mental health clinic. You, as a physician attached to, or at least deeply involved with, a flying unit may find yourself in a similar position.

The Aerospace Clinical Psychology Program and the Aerospace Behavioral Health Program have been curtailed. The only formal specialized training currently available to clinical psychologists is the Aircraft Mishap Investigation and Prevention course, a one year postdoctoral fellowship, and an “Aeromedical Psychology” course offered by the U.S. Army at Ft Rucker, AL (37).

CIRCADIAN RHYTHM IN AVIATION

Wiley Post, the first person to fly around the world, in 1931 discussed problems which we now identify as due to the disturbance of circadian rhythm (23). Although biological rhythms had already been the subject of scientific inquiry for 200 years (27), this represented their first prominent appearance in relation to aviation. The term "circadian" originates from the Latin word "circa" meaning about and "dies" meaning a day and serves as a good reminder that this bodily cycle is timed to the rotation of the earth upon its axis (54 [chap. 4]). Events which help synchronize the person's rhythm with the environment such as meals, normal work schedules, hours of light and darkness, and so forth are referred to as synchronizers, cues, entraining agents, and zeitgebers (49). Desynchrony or desynchronization refers to that state in which the person's circadian rhythm is inconsistent with the local environment's cues. "Circadian rhythm" refers to a collection of daily bodily rhythms (e.g. temperature, sleep, wakefulness, physical activity, memory performance, electrolyte excretion, cortisol, and other hormone levels, among others), rather than
any particular one (27, 63). Human circadian cycles range from 24 to 27 hours in length, averaging 25 hours (15 [chap. 23], 27).

The body can normally adjust to a shift in the environment of 60-90 minutes per day, as in travel by boat (23). Desynchrony is caused by traveling too rapidly to permit immediate adjustment to the new environment’s zeitgebers, usually by crossing four or more time zones (23, 43), hence, the popular term "jet-lag." Resynchronization on the new schedule is hampered and symptoms increased by multiple bodily hormonal systems shifting phase at different rates of speed (27). Recovery from desynchrony was formerly thought to occur at the rate of 1 hour per day (54 [chap. 4]), but it is now considered to occur on a non-linear basis. Thus, the out-of-phase condition is halved every 48 hours or exponentially (27).

People vary in their susceptibility to desynchrony. It was once thought that there was a difference by sex, but more recently these reports have been found inconsistent (23). There is agreement that older persons, including aircrew over age 40, have reduced strength of circadian control and more difficulty with desynchrony than young adults (15 [chap. 23], 23, 43). All persons are found to be more affected by travel from west to east than vice versa (14 [chap. 13], 27). Alcohol and hypoxia exacerbate desynchrony (43).

The symptoms produced by desynchrony are multiple. There is a generalized discomfort and sense of fatigue, a lowered physical activity level, reduced efficiency, and impaired judgment or decision-making (14 [chap. 13], 43). Desynchrony has been suspected as contributing to various aircraft mishaps and the Three Mile Island nuclear plant accident (27). Desynchrony is of great concern to military flight surgeons because operational requirements often dictate that aviators be ready for flight within 2 hours of their arrival in another time zone; this desynchrony may be aggravated by physical fatigue if the aviator personally flew the aircraft to the deployed location.

Various attempts at therapeutic intervention have been made. One widely reported is the Argonne National Laboratory Diet (27 [appendix 1.3]), but the efficacy of this is not proven. More positively, temazepam at 30 mg, had already been subject to extensive evaluation by the Royal Air Force before the Falkland Islands War. During that conflict, it was widely used with great success, and without dangerous side effects among aircrew, to induce sleep with which desynchrony would have interfered (31, 27). Preadaptation can be done by the individual if the schedule permits. One style of preadaptation is to gradually alter the person's sleep-wake pattern to match that of the destination (said to be the method of Wiley Post). The other is to go to the destination a few days early and adjust there without critical responsibilities (63, 54 [chap. 4]).

A different view point on circadian rhythm is found in the literature on sustained operations. Here, the concern is with the effectiveness of persons being awake (including work and meal time) for 20 hours, sleeping 3 or 4 hours and being awake another 20, perhaps for several days in a row. In this context, the length of a nap (not the 3-4 hour sleep) is generally more important than its temporal relation to circadian rhythm. However, when there is a heavy sleep debt, the nap should not be taken between 0400 and 0700 hours due to subsequent profound sleep inertia.
People can get by with 3 or 4 hours of sleep per day and remain effective, but they cannot maintain their performance at the baseline level (48).

A study conducted by the USAF Armstrong Laboratory in 1993, looked at B-1B bomber crews and their management of back-to-back, long-range missions. Simulator studies indicated that, with careful sleep and duty management, crews could handle two back-to-back 36-hour duty days with 36-48 hours between them. Three long missions could be tolerated if good sleeping facilities were available, ensuring rest between flights. This work uncovered several important factors that determine how long a rest period is needed between long sorties. These factors included the duration of the mission, the amount of sleep obtained in the last 24 and 48 hours, and the amount of flight time logged in the previous 24 hours. To manage long-duration missions, these researchers recommended getting plenty of sleep two to three days prior to the mission, eating well, exercising, avoiding alcohol, planning a mission sleep schedule, and identifying mission segments when fatigue symptoms will be the worst. When crew members are tired they are advised to drink liquids, eat hot foods, move around, talk, and listen to music. The mission commander should tell each crew member when he or she is expected to sleep. The bottom line: Any sleep is good (56).

The costs of sleep deprivation should be known to the aviator and include, irritability, inattention, and loss of situational awareness. Most adults need 7.5 to 8 hours of restful (undisturbed) sleep. Rapid Eye Movement (REM) sleep is the most restful sleep despite its seemingly restless quality. The bulk of REM sleep occurs during the last third of the sleep period (46). Good sleep hygiene can maximize the beneficial effects of a short sleep time by decreasing the time it takes to fall asleep and keeping awakenings to a minimum. Tips for good sleep hygiene include: daily exercise, keeping a moderate bedroom temperature, avoiding sleep preparations, eating a light snack at bedtime, avoiding excessive liquid consumption before retiring, avoiding caffeine, avoiding alcohol, not forcing sleep, using regular sleep times if possible, avoiding tobacco, not looking at the clock to calculate remaining hours for sleep, not napping if it prevents you from sleeping at night, and using your bed only for sleeping and sex.(46).

**STRESS AND FATIGUE**

Comprehension of stress and fatigue suffer from the outset with problems of definition. Namely, there is no measurable or specific definition of fatigue (15 [chap. 32], 31, 27). Concerning stress, some hold that any amount is negative or destructive, whereas others find a moderate amount of stress necessary for optimal functioning. Insufficient amounts of stress can lead to boredom and low productivity, and excess stress to physical or emotional degradation (63). Against this caveat, we note that "stress" is a popular topic in current lay as well as professional media.

Fatigue is considered along different axes by different authors. Traditional considerations by aerospace medicine specialists have focused on acute skill fatigue, such as; decrements in psychomotor function, acceptance of lowered standards of performance, and narrowed attention
span. This type of fatigue is often observed following one or more very demanding flights in a
day, or even intense, uncomfortable mental activity such as taking a major examination. Acute
fatigue is contrasted to cumulative fatigue where the aviator has not recovered from the first
sortie before undertaking the second, then the third, etc., with ever increasing fatigue (63). In
cumulative fatigue, the aviator’s tolerance of stress is reduced on each subsequent flight. Acute
fatigue can be overcome at least briefly by special effort or stimulation, for example in an in-flight
emergency or during combat. This type of fatigue is rather simply treated by a day's rest and
adequate nutrition. Cumulative fatigue requires a longer period of rest.

More recent thinking proceeds along another axis categorized as external, environmental, or
work-imposed stress versus self-imposed stress. Aviation-related external stresses include: noise;
combat; vibration; the effects of altitude, such as hypoxia and trapped gas; extreme temperatures;
low-level flying with night vision devices (15 [chap. 32], 63); and low relative humidity (27).
These illustrate rather than exhaust the list. These stresses may be modifiable to some degree by
the flight surgeon (who can give current briefings on hypoxia, for example), the aviation life
support shop (who can provide well-maintained oxygen masks), the aerospace psychologist (who
can provide stress management and performance enhancement lectures and handouts), and the
commander (who can keep the number of night or weather flights to the minimum required by the
mission.

Contrasted to the stresses beyond the control of the individual pilot are self-imposed stresses
over which the flier has control. These are remembered by the mnemonic "DEATH." "D" stands
for drugs, whether prescribed, over-the-counter, or illicit and includes side effects like, caffeine
induced tremor. "E" refers to exhaustion that can lead to lack of sleep and physical exercise.
"A" covers alcohol and its depressant and judgment-altering effects. "T" indicates tobacco, which
besides other deleterious health effects, produces 7-10% carboxy-hemoglobin, an equivalent to
approximately 5,000 feet of altitude, and diminishes night vision. "H" deals with the tendency to
eat irregular meals with high sugar snacks, sometimes causing insulin overshoot with resultant
hypoglycemia (63, 15 [chap 26]). In these areas, the flight surgeon may be of great assistance to
the pilots in the squadron, whether seeing them individually at the office or in presentations at
regular squadron meetings.

Since it is an inherent part of the typical pilot's personality to need to be in control, and in
particular to avoid feelings, the anxiety induced by stress can be especially upsetting to aviators.
Besides helping to change the lifestyle, the flight surgeon may specifically acquaint the stressed
pilot with "stress management" strategies. Here, the goal is for the pilot to learn one or more
techniques to practice for anxiety relief. This process may be more formal when the flight
surgeon instructs the pilot directly or refers the flier to the base psychologist who is trained to
perform classical Jacobsonian progressive relaxation, biofeedback or other methods. Alternatively,
the process may be less formal by advising the pilot to try out one of the several inexpensive lay publications on relaxation.
Airsickness can be devastating to an aviator's career and to his self-esteem. The very new aviator may end up finished before he even really starts. The techniques to manage, or even prevent, airsickness, however, are simple. With a relatively small investment of time spent learning these techniques, you can help an aviator return to the sky.

The efficacy of treatment for airsickness has been shown in several programs (33). The Sheppard AFB airsickness prevention and management program historically has a high success rate. Well in excess of 90 percent of student pilots experiencing airsickness were able to continue in pilot training (37). The program eventually changed its focus from treatment of airsickness to proactive measures to prevent airsickness. The causes of airsickness are multiple. Each individual case is likely to be a combination of several important factors. The first is adaptation. Acceleration, unfamiliar aircraft attitudes, and environmental stressors in the aviation environment present adaptational challenges. During undergraduate pilot training, lack of adaptation is the most common reason for difficulties with airsickness. Another common cause is Sympathetic Nervous System over-arousal. The body gears itself up to meet the challenges previously listed. A frequent problem is systemic overshoot resulting in rapid breathing, heart palpitations, sweating, etc. The next problem is conflicting information. The brain receives conflicting information from the visual and vestibular systems during motion stimulation. This mismatched information is interpreted by the brain in much the same way that cues about poisoned food are processed. The responses of general nausea and emesis are therefore not unreasonable. The next common cause is anxiety regarding performance. Aviators, similar to other high achievers, want to do very well. It is possible, however, to become over-motivated. The unfortunate result is performance decrement. Think about studying unusually hard for an exam and "choking" while taking it. Another problem causing airsickness is called 'manifestations of apprehension.' Airsickness is sometimes an indication that a person would rather not be flying or is afraid to fly. Rather than consciously experiencing the fear and recognizing their desire not to fly, a physical symptom is unconsciously manufactured that prevents flying. This cause, (known as “fear of flying”) , is rare in student pilots and even more rare in rated aircrew members. The last possible cause of airsickness is low motivation. Airsick aviators are sometimes poorly motivated. Some discomfort is inherent in the flying environment and even contributes to the fun of flying. When an individual consistently complains about the discomforts of flying, suspect poor motivation and consequent lack of tolerance to learning how to deal with the challenges of flight. Low motivation is much more common than manifestations of apprehension in the airsick student pilot population.

There are two types of airsickness and both result in a deviation in the mission profile. The first is active and is characterized by rapid heart rate, sweating, excessive salivation, cold hands and feet (literally) and nausea, finally culminating in emesis. The second is passive and includes all of the above symptoms except emesis. Nevertheless, a deviation in the mission profile occurs due to the nausea and/or discomfort.

Helping aviators avoid or manage airsickness consists of several phases. Phase 1 involves prevention and education and includes exposing all incoming students to prevention and management techniques, before they fly. The Anti-Airsickness Behavioral Checklist (see below) includes
diaphragmatic breathing and sleep hygiene guidelines. Phase 2 is reassurance and re-education. If a student becomes actively or passively airsick and is referred to you, the flight surgeon, reassure him by normalizing the experience and personally giving him a copy of the behavioral checklist. Phase 3 includes relaxation and desensitization. If a student continues to experience airsickness, it is time to get a good look at what might be going on. This might also be a good time to make the referral to the local aerospace psychologist, if he/she is available. Plan on spending about 30 minutes with the airsick student and explore his motivation to fly, at what point in the flight he began to feel sick, what his particular symptoms are, etc. It is useful to use a structured interview. If you determine that the student is motivated to fly and not suffering from manifestations of apprehension, this is a good time to get started on relaxation and desensitization exercises. A five tape series has been developed that takes the student through a flight in a coping fashion. Remember to reassure the student and normalize his experience. The final phase was coined “BAM” (Behavioral Airsickness Management) at Sheppard AFB. It is an aggressive and formal intervention used when three active episodes of airsickness have occurred. It involves three consecutive days of spinning the aviator and coaching him how to recognize and deal with his symptoms early.

The Anti-Airsickness Behavioral Checklist begins with recommendations for pre-flight. Advise the students of the following and be sure to be very reassuring at all times. Have them start by practicing diaphragmatic breathing (see below) and eating before all flights. Caution against acidic foods, such as orange/tomato/grapefruit juice, caffeine, and greasy food. Have them drink plenty of water to keep well hydrated and practice good “sleep hygiene” (see rules for good sleep hygiene under section on fatigue). Advocate the wearing of comfortable, loose clothing. Ensure they breathe during the flight, slightly slower than their instructor pilot (I.P.). Have them use diaphragmatic breathing at a slow, comfortable pace. Caution against head movements. If they need to make a clearing turn, advise them first to move their eyes and then follow with their head. Have them practice this technique during driving and other ground activities. Advise them to keep two fingertips on the stick at all times when the I.P. has control of the aircraft, if possible. This technique allows them to feel in control and anticipate motion. If their feet get cold during flight, have them wiggle their toes to increase blood flow. If, despite your and their best efforts they still get sick, whether active or passive, reassure them. Many students get sick when they are learning to fly and get over the problem with more flying. Airsickness is usually the result of stress and lack of adaptation. Airsickness is a training problem that many pilots before them have experienced and coped with successfully. Have students and other aviators use these techniques even if they are not prone to airsickness to enhance performance.

To practice diaphragmatic breathing, advise a comfortable posture. Loosen clothing or flight suit. Have them place their hand lightly on their abdomen and inhale slowly through their nose, allowing the air to go all the way down to the abdomen. The abdomen should expand, causing their hand to move forward. (Sometimes it is helpful to have them practice in front of a mirror.). Advise them to hold their breath gently and momentarily. Exhale slowly (taking 2-4 times as long to exhale as to inhale), pushing the abdomen in with their hand. Repeat at a slow, comfortable pace. When flying with an I.P., advise them to listen to his or her breathing on the "hot mike" and breathe slightly slower than him or her. (This technique can actually keep them calmer than their I.P.). If they begin to feel dizzy, advise that they simply resume their normal pattern of breathing (they may not be used to getting
that much oxygen.) This technique requires practice, practice, practice. Smokers may especially notice a difference in their experience of relaxation using this technique.

FEAR OF FLYING

Fear of flying is a symptom which can afflict air passengers as well as the aircrew. However, while fear of flying may be readily resolved by passengers simply choosing not to fly, for military aircrew it represents a major problem. “Fear of flying” may represent one of several symptoms in a person suffering from a diagnosable mental disturbance. However, the usual use of the term "fear of flying" is restricted to a single symptom in an otherwise healthy person and is used in this context in the discussion below. It is commonly thought of as a "symptom without a disease" (31) and is frequently considered in relation to motivation to fly (14 [chap. 17], 29, 31, 53).

Motivation to fly is derived from either of two roots. The emotional root is determined earlier in life, usually before the age of 8, and is expressed as, "I've always wanted to fly!" (31). It is related to the need for active mastery of the environment, and flying is perceived as an extraordinary opportunity to pursue this theme. The cognitive root is of later origin, as a late teen or even after entering the service, and is based on recognition of the career, prestige, or other opportunities opened to one by flying (14 [chap. 17]). In actual practice, there is often a mixture of the two. While either motivation may last a career or fail under the real dangers of flying (a personal close call or loss of a friend) or the process of maturation, the former is more durable overall. During undergraduate pilot training, the Air Force considers conscious fear of flying, termed “manifestations of apprehension” (MOA), as grounds for nonpunitive dismissal from flight training (14 [chap. 17]). MOA is, as described under the airsickness heading, presumably unconscious fears exhibited by frequent sick call visits and psychophysiologic complaints. The Navy has similar views and procedures (64).

After the person is rated, procedure and disposition are different. Again, the presentation may be conscious fear of flying and the person is referred to the flight surgeon and a mental health provider to determine whether it is a part of a mental illness (29). If so, the person is treated until recovered. If the person does not recover, disposition is through medical channels. However, if the person is found to be without any mental illness or recovers from the mental illness but still refuses to fly, then psychotherapy may be useful to relieve the fear. It is possible to form a therapeutic alliance with someone whose motivation is not altogether gone. In the past, therapy had little to offer aviators with a fear of flying (10), but since the development of behavioral approaches, results have been more gratifying (60, 4, 10, 29). Such therapy must be initiated promptly to avoid further fixation of the symptoms over time. This therapy exceeds the scope of the flight surgeon and is in the purview of the aviation-experienced psychiatrist or psychologist. The person who refuses therapy and the person who still declines to fly after therapy are subject to administrative disposition (no mental illness but unwilling to fly) which can range from nonpunitive re-classification to dismissal from the service.
Other cases of fear of flying will present with psychophysiologic symptoms. The procedure here is to perform a thorough medical work up, determining that there is no detectable physical basis for the complaints. Attention is then given to the likelihood that they are due to psychological factors and are outside the consciousness of the aviator. Clues that the problem is psychogenic include, the aviator's preoccupation that the symptom interferes with flying (often safety is seen as compromised somehow), preoccupation with the symptom and flying, lack of concern over an underlying disease process, and negative or reservedly positive reply to the question of whether the flier will fly again when the symptoms are resolved (14 [chap. 17], 31, 29). As the fear is unconscious, the person typically declines any therapy. These cases may be very difficult, and whether to proceed with a medical disqualification for the symptoms or an administrative disposition for refusal to fly can be a vexing problem. As this can be a difficult dilemma, just as the one of being certain that there is no mental illness present in the case of conscious fear of flying, the aviator should have a consultation with an aviation experienced psychiatrist or psychologist for the greatest satisfaction of the aviator, the Air Force, and the flight surgeon.

In Strongin’s overview of the history and contemporary studies of Fear of Flying published in 1987 (58), he describes three important questions the flight surgeon should explore when faced with one of these cases. They are: whether the symptoms stem from a preexisting disorder; whether the ego was overwhelmed by situational stress or overwork; and, whether changes in life circumstances have temporarily altered the flier’s motivational or defensive structure. The flight surgeon may then apply his or her clinical judgment to the problem of diagnosis and treatment (58).

**AIRCREW BRIEFINGS**

The following items are intended to be helpful tips when briefing aircrew members. [Adapted from an article by Col. (Dr.) Roger F. Landry, published in FlightLines, the flight surgeon’s newsletter.]

* Aircrew members are not stupid or lacking in adequate attention and concentration. They may appear rude and impulsive but in reality they are quite conforming. It's just that they shun abstractions and get bored easily. Ignore these realities at your peril!

* Be brief when you brief. Remember, as a psychologist, flight surgeon, or physiologist, you represent a threat. The milk of aircrew kindness comes in very small containers and has a quick expiration date. If you are any good, they are likely to afford you only five or 10 minutes. If you are not particularly good, then you will have only a matter of seconds. If you insist on continuing, you will find yourself facing an increasingly hostile mob. An ugly scene may develop. Consider running for your life.
* Be funny. Aircrew like to have a good time and don't take themselves too seriously. Don't take yourself too seriously. Remember, seriousness is for shoe clerks. If aircrew members are not laughing or smiling at least once every ten minutes, they must be either grounded or dead (a distinction they don't make).

* Prepare so that you appear spontaneous. No, the preceding is not an oxymoron. Aircrew members love spontaneity even if it is contrived. Remember, these people are compulsive planners and leave little to chance.

* Know what you're taking about. Bullshit artists are quickly spotted for what they are - targets!

* Use aviation metaphors and colloquialisms freely if you know what you are talking about. For example, the "HUD" is the Head Up Display, not the Heads Up Display (credit the pilot/psychologist Walt Sipes for making this point). Utter "Heads Up Display" and you may thereafter find yourself ignored. Know that "recage gyros" means get reoriented, etc.

* Be prepared for some good-natured heckling. They wouldn't do it if they did not like you. The ultimate insult from these people is for them to ignore you. Remember, they're paying attention if they're engaging you.

* Watch any "wannabe" tendencies that you may be harboring. Remember, we are not pilots. The healthy motive for working in the aeromedical environment is to positively impact the flying mission and increase flight safety, not to give you an excuse to wear a flight suit.

**COMBAT FATIGUE**

While inferences can be drawn as to the meaning of "nostalgia" diagnosed in the American Civil War, the clear differentiation of combat fatigue as an entity occurred in World War I, according to David R. Jones, M.D., M.P.H., retired USAF flight surgeon and psychiatrist. Originally, it was titled "shell shock," owing to the belief that it was caused by the concussion of artillery shells. The organic contributions to combat fatigue are now known to be fatigue, thirst, wounds, sub-optimal nutrition, sleep deprivation, and sleep cycle interference, according to Marlowe at the Walter Reed Army Institute of Research.

What was learned regarding combat fatigue in World War I was largely forgotten between the wars and essentially rediscovered from scratch in World War II. This knowledge was carried forward into the Korean police action and was confirmed, but again principally in relation to ground troops (25). Due to the vast expansion of air power and aviation personnel, more attention was focused upon combat fatigue in the air war setting and information was published following the Vietnam War (30, 31).
Although there was a high level of consciousness regarding combat fatigue in both the air and ground settings in the Southeast Asian War, and the ground war experience was exhaustively documented (57, 32), essentially nothing was recorded concerning the experiences of US Air Force aircrew, whether on a case report or epidemiological basis (30). A thorough review of the Aerospace Medicine Reports from the involved air bases during the war by Dr. Ryder, at the USAF School of Aerospace Medicine in 1988, attempted to fill this gap, but found inadequate information to document a single case of combat fatigue.

Regarding future conflicts, the Air Force has realized that aircrew will likely not be the only members at risk, as air bases will be vulnerable to aerial and ground attack by the enemy (31). Accordingly, it behooves the flight surgeon to have a basic knowledge of combat fatigue. It is well to remember that, on the average in World War II, one out of five casualties was neuropsychiatric (35).

Marlowe defines combat fatigue as a psychiatric syndrome of functional etiology with varying manifestations and degrees of severity, of acute onset, and occurring in the combat setting. Often the clinical picture is fluid rather than fixed over time. Patients may present themselves with the appearance of apathy, withdrawal, and even psychomotor retardation resembling catatonia. At the opposite extreme is the out-of-control patient with hyperactivity who can be indiscriminately violent until controlled. Again, the person appears to be psychotic, depressed, or anxious. Finally, the faces of combat fatigue include apparent conversion reactions (e.g., blindness, paralysis, or amnesia) and psychosomatic reactions (e.g., headaches or diarrhea). Circumspection must be used with the latter, as premature evacuation diametrically opposes the optimal treatment. Although it is appreciated that some patients presenting themselves with acute psychiatric symptoms during combat will have a psychosis or another condition requiring evacuation to a higher echelon of care, as a rule it is wiser to begin with the initial impression of combat fatigue and proceed accordingly.

The most useful treatment approach for combat fatigue is represented by the acronym "BICEPS". (31)

1. **B**revity means treating for 24-72 hours, with the explicit goal of return to duty upon completion of treatment.

2. **I**mmediacy refers to treating a person as soon as his behavior reveals that the individual is unproductive, without awaiting a total collapse of function or personality.

3. **C**entrality is treating combat fatigue patients in a single location, not intermingled with other patients. Any who are violent or disruptive to others must be controlled and housed separately.

4. **E**xpectancy is the conscious attitude and goal of the staff that each patient will recover and return to duty.

5. **P**roximity to the unit is the key to treatment in two respects:
   a). Evacuation to the rear has been proven since World War I to significantly reduce recovery and to promote further regression and fixation of symptoms for years, if not life (57); and
b). When the soldier is close to his unit, he can maintain ties with it, and thus keep his principal support in combat, his group identity. It is even better if unit members or leaders visit the patient, reminding him of his place in the unit and its acceptance of the person despite suffering this illness.

6. Simplicity is treatment in the present (not uncovering or long-term therapy) which is completed within the 24-72 hours' time frame.

Treatment rests on two unequal axes; supportive, restorative therapy and medications. The predominant thrust of the literature is toward supportive, restorative therapy. This effort may consist of opportunities for food, rest, sleep, emotional ventilation, and acceptance of the patient by medical providers and his unit members. A positive attitude towards the patient and his future by the staff and unit visitors can go a long way with a night’s rest (25). Treatment with medications can include the use of a hypnotic, such as temazepam at 15-30 mg, if indicated for any sleep difficulty. An antipsychotic such as haloperidol at 10 mg or chlorpromazine at 100 mg is appropriate in cases of psychosis, violence or uncontrolled hyperactivity. An anxiolytic such as diazepam 5-10 mg or lorazepam 1-2 mg can be used for marked anxiety and tremor (31, 25, 57). The Israelis’ further report that clean clothing to replace any clothing stained with blood is helpful (Reuvan Gal, personal communication, 1989).

The above addresses the treatment of combat fatigue after it has developed. Preventive treatment means reducing the individual's susceptibility to combat fatigue. This is done by educating commanders and all members that:

a. Group cohesion is the greatest support of all for individuals in combat.

b. Every person exposed to the stress of combat is at risk.

c. Development of actual combat fatigue does not relate to personal psychological limitations because the cause of combat fatigue is the stress of combat (54[chap 23]), especially its intensity and duration.

d. Everyone has a "breaking point" at which one no longer tolerates the stress and cannot function effectively.

e. It is normal to experience fear in combat, and also grief for friends lost.

f. These emotions are often accompanied by the somatic expressions of anxiety and depression.

Experience has shown repeatedly that units with better training and leadership suffer much less combat fatigue (35). Finally, the commanders are advised that they can reduce their unit’s susceptibility to combat fatigue by doing whatever is possible to normalize sleeping and eating schedules; to regularize flying schedules (as opposed to constantly changing "shifts"); and to promote an effective preventive medicine program.

More recent information on combat fatigue comes from experience gained during Operation Desert Storm. A study published by Hospital and Community Psychiatry in 1992 (42) reported the results of the treatment of 158 Army combat stress casualties in a non-hospital based care delivery system. Simple interventions were used in this setting to briefly treat the soldiers, of
whom 72 % were men. Ninety-nine percent of the treated soldiers were returned to duty, demonstrating the efficacy of the BICEPS model.

SURVIVAL AND PRISONER-OF-WAR CONSIDERATIONS

The flight surgeon may be very helpful to his or her assigned aircrew by giving group briefings prior to entering, or while in, combat concerning mental preparation for survival or prisoner-of-war (POW) situations. With the wide-spread use of electronic locator transmitters in peace time, the likelihood of extended survival prior to rescue in hostile terrain and climate is generally low, but for those frequently flying over such terrain, mental preparation for survival is in order.

Prior to entering combat, it is wise to prepare the family as much as possible in both legal and emotional issues. Recommending the advice of a lawyer for wills and powers of attorney can be helpful to family members. Emotionally, families should be aware of possible role shifts which can occur during the sponsor's absence and the resources available to them through the mental health clinic or family services.

In the combat or survival situation, the first emotional response is generally that of disbelief (64). This results from the sudden shock of a change from feeling in control of one's life, so important to the pilot's normal emotional balance, to being entirely out of control. In addition there is the shock of suddenly being in an alien culture or environment. This period lasts from six weeks to six months, during which many of the symptoms seen in a typical depression can occur, including: difficulty concentrating, sleeping, making decisions and performing complex tasks. Some POW's who were repatriated during this phase continued to exhibit these symptoms after return to safety. This phase ends, sometimes quite abruptly, with the firm decision to cope with the situation and get along with life under the new conditions.

The next phase is the actual coping with the circumstances. Here, it appears that developing a certain detachment or apathy is a healthy defense. Conversely, those with excessive dependency or rigidity may unwittingly bring more abuse upon themselves and otherwise cope poorly. In other terms, those who are more neutral may fare much better in terms of handling the stresses than those who are either extreme resisters or collaborators.

Particularly in the Vietnam experience, prisoners were astonished that they broke under torture, and sometimes quickly. This rapid break under torture induced guilt and self-doubts. When they were able to communicate with other prisoners and found their experiences were similar, guilt was alleviated. In this context, mental preparation plus flexible application of the Code of Conduct will be useful supports.

Further phases of adjustment occur at the time of repatriation, and later, during readaptation to life back home. These also have their dangers. Overall, the greatest support to the individual
throughout these phases is group identification (64). In the capture and captivity phases, this identification is with one's country and fellow captives. Thus, organizing communications and a leadership hierarchy is extremely important. On repatriation, the group reverts to its usual family, work, and social support systems.

For those in solitary confinement, keeping mentally active is extremely important. Learning the language of the captor and performing a sort of private psychoanalysis through review of one's life are examples of mental exercise. One man spent his time in captivity founding a lumber yard, moving his stock about, selling stock, and expanding his business to form a chain of stores in nearby cities. Upon release, he headed quite an "empire."

In the case of communist captors, it can be expected that there will be efforts at indoctrination with communist ideology. There is no evidence that such efforts actually persuaded any Americans not already rootless or disaffected to espouse communism (64). Nor was there any magical "brainwashing" of prisoners to abandon their moral values.

Concerning the development of psychopathology during captivity or following repatriation, the evidence shows that this is related to the degree of stress inflicted and its duration. There has been no demonstrable relationship between psychiatric predisposition existing before capture and pathology after repatriation (61).

Finally, with the exception of those prisoners who developed overt psychopathology, such as post-traumatic stress disorder, there was an undetermined percentage who felt that they had undergone personal growth as a result of the experience (61). This is worth bringing to the attention of the aircrew.

In her autobiography, Rhonda Cornum M.D., an Army Flight Surgeon and prisoner of war in Iraq, comments: “Being a prisoner of war is the ultimate loss of control, especially for a POW with two broken arms. What I learned in those Iraqi bunkers and prison cells is that the experience doesn’t have to be devastating, that it depends on you. You can give up control of your mind, but no one can take it away from you. I convinced myself that as long as my brain was working, I would be fine.” She states that the entire experience of the war was a challenge that would be tough to match (12).

PSYCHIATRIC ASPECTS OF MISHAPS AND DISASTERS

The usual duties of the flight surgeon in an aircraft mishap investigation are spelled out in Air Force safety regulations and in another chapter of the Flight Surgeons Guide. However, the humanistic aspects of dealing with the survivors, the squadron mates of the deceased, and the families of all of these people should be considered. These considerations may also apply to near-misses or dramatic in-flight emergencies within the squadron and to terrorist actions involving the base or its deployed personnel.
On an individual level, persons who have just survived a life-threatening experience are typically emotionally shaken and likely to experience feelings of disbelief or "emotional numbing" (13). This feeling state may then resolve, spontaneously or with assistance, or may progress into a depression. The latter is more likely to occur if there is additional "survivor’s guilt." Survivors normally suffer what is termed acute bereavement with the usual symptoms of preoccupation over the loss, difficulty concentrating, intrusive thoughts of the loss, feelings of emptiness, shortened attention span, difficulties making decisions, disturbed sleep, assorted somatic discomforts, and so forth. Among their concerns, especially for aircrew whose defenses usually consist of avoiding or compartmentalizing feelings, is the question of whether such feelings are normal. Since aircrew often avoid their feelings, they may have difficulties due to unresolved feelings, as illustrated in the case of a weapon systems operator (WSO) who developed fear of flying after a mishap (29).

In these cases, the flight surgeon may be very helpful on the individual level by encouraging ventilation, by accepting the person's feelings, by letting him know that his feelings are normal, and by educating him that sleep disturbance and other symptoms are common accompaniments of grief. The aviator should also know that grief reactions are self-limited. The strength of the flight surgeon's authority reassures the person, and positive suggestion is made that the person will recover, just as in general supportive therapy (31). While the person may seek out the flight surgeon to discuss these feelings, the real point here is that the flight surgeon needs to take the initiative to formally or informally assist the person, just as the flight surgeon practices preventive care for physical problems.

The same feeling-state that affects individuals operates on the group level after loss, causing inefficiency in the unit or disruption of the military mission, if it is not dealt with (6, 9). In fact, it is found that a series of feeling-states occurs before resolution of grief and return to normal functioning. These feeling-states can last as long as six months even with intense psychiatric intervention and enlightened, vigorous, command intervention (6).

While obviously a full-scale psychiatric response is beyond the scope of the flight surgeon, support of psychiatric intervention can be invaluable due to the flight surgeon's relationships with the commanders and the flying unit. The flight surgeon can facilitate treatment and is in the best position to note whether some subgroup (e.g., maintenance section which worked on the plane just before the crash) is being overlooked. The flight surgeon can also facilitate acceptance of psychiatric services and command interventions by the served population and further encourage them to deal with their feelings rather than moving off base or otherwise "getting lost" to care.

In a presentation to the American Psychological Association in 1987, Dr. Bartone described the US Navy mobile psychiatric assistance team known as SPRINT, which travels to any base experiencing a disaster or terrorist attack. The US Army is developing such a team and the US Air Force is considering such a development. The possibility of joint service or inter-service assistance is growing. Services provided by the SPRINT team include advice to commanders and assistance to the base leadership throughout the period of chaos and numbing. This reminds the leaders of steps they can take to decrease psychiatric morbidity and to maintain mission readiness.
These steps include: Assuring proper sleep, encouraging avoidance of alcohol, reinforcing unit cohesion, mobilizing base and community supports, attending to one’s own psychological needs, and ensuring adequate rest for everyone. Being aware of the existence of such teams, the flight surgeon can advise the commander in their use during a time of need. In mishaps or small scale disasters not requiring external assistance to the base, the flight surgeon can still encourage command to use these same principles for the benefit of all.
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