

Society of U. S. Naval Flight Surgeons



Naval Aerospace Medical Institute, Code 10
Naval Air Station, Pensacola, FL 32508

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NEWSLETTER

APRIL, 1985

PRESIDENT'S COMMENTS

Whether dealing with a Marine Corps Field Flight Performance Board, a Navy Field Naval Aviator (or NFO) Evaluation Board, or a Training Command Student Pilot (or NFO) Disposition Board, we have a recurrent Board problem resulting from vague official guidance. The question is, can you hold a Board on an aviator who is either NPO or NAA? The answer is yes. The answer is also no.

The basic guidance that has generated the confusion is found in NAVMILPERSMAN 3410300 and in MCO 1000.6E. The requirement for a flight surgeon as a Board member is found here. PERSMAN (but not the Marine Corps Order) spells out that a *different* flight surgeon should do the aeromedical evaluation, reporting his findings to the Board. COMNAVAIRLANT has the only instruction I can find that gives specific guidance for the flight surgeon in CNAL INST 5420.3B, enclosures (8) and (9). Outside AIRLANT, the reader is left to his own devices to ascertain the exact role of the flight surgeon Board member. It is to be taken for granted that his unique aeromedical perspective is his Board membership ticket. If the proceedings of the Board uncover that an aeromedical problem is responsible for the performance that caused the Board, what then? In whose house is the solution to be found? The line house or the aeromedical house?

For example, a 32-year-old LCDR E-2 pilot with 220 carrier landings and 3800 hours finds himself before a FNAEB because of a recent change in his lifestyle that should identify him as The Failing Aviator. His private life is a shambles, especially his marriage, but there is no divorce on the immediate horizon. He wrecked his new Porsche in an accident that could have cost him his life. He has two arrests in the last few months, one for reckless driving, and a DWI that came out of the accident. His former discretion in the use of alcohol has instead become a nightmare as he has evolved into a skirt-chasing party boy. The new crowd that is his present circle of friends is Yuppie and hedonistic. He has become a regular caller in sickbay with sports related injuries over the past six months. Simultaneously, a story is circulated about a gambling loss he is supposed to have incurred that is wholly inconsistent with his old conservative image. A notoriety is beginning to surround his sexual activity in that he is not just indiscrete, he flaunts it. Several in-flight headwork problems that were clearly dangerous have finally brought him to official attention. The squadron CO has convened the FNAEB for obvious reasons.

The flight surgeon's eval surfaces the above information. His peers are adamant that he needs to be in another occupation. He is presented to the Board as temporarily NPQ but AA for duty involving flying because of the existence of The Failing Aviator Syndrome. He is grounded for six months. *Question:* Is he an appropriate subject for a Board? *Answer:* No. His

aeromedical problem, namely his temporary inability to cope with stresses in his private life, is the reason for his poor performance. Fix his coping, and his flying skills are likely to return. This is not unlike a broken leg. He can resume flight duty after his "injury" heals. Field Boards are not solutions to medical problems when the medical problem and the flight deficiencies are cause and effect related.

But in another example, it can be a different story: A 29-year old passed-over LT C-12 driver, who has called attention to himself by serious headwork and accountability aberrations, including a 4-G break over the numbers with three passengers aboard, now claims to have had hidden chronic back problems for years. His T-spine x-ray would impress even a medical student. This information surfaced at the hands of the flight surgeon as a direct result of the Board. The flight surgeon pronounces the pilot permanently NPQ but AA. *Question:* Can they Board him? *Answer:* They can if they want. They don't have to. The aeromedical problem for which he was grounded is unrelated to the events that brought him to a Board. Supposing that the pilot would be able to have a surgical procedure that could solve his back problem. If he did, we are back to "Square One." Whether the medical problem has a remedy or not is not the issue here. The issue is the relationship between the aeromedical problem and the "line" problem. Can a bad back turn you into a turkey?

Because the PERSMAN article 3410300 specifically states that the Field Board shall "...evaluate the performance, potential, and *motivation* for continued service. ..." the perennial question arises when, for instance, the SERGRAD instructor who successfully flew T-44's can't get carrier qualified in the S-3 RAG. Is his problem simply skill related, a line problem? Or is it fear of carriers, which may or may not be a line problem? Should the flight surgeon declare him NAA and thereby abort the FNAEB? It may seem unlikely that a several-thousand-hour Naval Aviator could be diagnosed as having a fear of flying, but it can happen. To do so, it must be proven that the flier had, in fact, lived with a fear of flying, coping by sheer will power and guts that finally (and not surprisingly) were overwhelmed at the rounddown. If no such ubiquitous history is obtainable, he's PQ and AA, and his fate correctly is assigned to the FNAEB. Note that if the aeromedical disposition is "NAA:" the proceedings stop there, because the aeromedical problem in his case is directly responsible for the performance decrement. If it's *our* problem, the fix is ours. If it's *their* problem, the fix is theirs. The catch is that PERSMAN does not spell this out, and neither do the appropriate TYCOM amplifying instructions, except for AIRLANT.

One last example. A 30-year-old P-3 driver was involved in a series of headwork issues that appeared to have an unusual common denominator. He came to ultimately fly the P-3 as if it were a surrogate F-14. He scared more than a few people and

(Continued)

President's Comments (continued)

overstressed at least one airplane. The order for FNAEB was no surprise. The surprise came in the flight surgeon's eval that surfaced an alcohol problem that had been unsuspected. He was a closet drinker. The FNAEB was put on hold, pending successful completion of the appropriate treatment. Later, with a nicely ordered private life and demonstrated sobriety, the Field Board was reconvened to see if "the cure" also was to be considered the cure to the flight shortcomings. The flight surgeon in this case will likely find himself in the position of having to convince Board members of his judgement, yea or nay, before the selected disposition could be completed.

The role of the flight surgeon in FNAEB, FFPD or SPDB proceedings is to first, insure that the problem being addressed by the Board is rightfully in their purview, and second, to be the wisest Board member they ever saw.

FRANKE DULLY, JR.
Captain, Medical Corps
United States Navy

Pensacola will ensure a satisfactory level of fitness. In addition, the flight surgeon must adequately assess each candidate. Any current medical condition or significant past medical problem that precludes participation in an arduous physical fitness program is disqualifying for the aircrew rate. It must be remembered that an aircrew candidate in the AW rate might be asked to continue in SAR training. Therefore, all AW candidates should receive a physical examination Assessing his/her ability to perform as a SAR crewmember. Additionally, SAR CANDIDATES MUST HAVE ACCURATE ASSESSMENT OF THEIR VISUAL ACUITY AND DEPTH PERCEPTION.

FINALLY, AS MEMBERS OF THE ALERT FORCES, ALL AIRCREW CANDIDATES MUST BE UP TO DATE ON ALL IMMUNIZATIONS PRIOR TO ARRIVAL IN PENSACOLA.

Attention to these simple but vital details will prevent the unfortunate and unnecessary task by NAMI Flight Surgeon of informing aircrew candidates that they are not qualified to begin training before it has been even begun.

CAPT A.F. WELLS

AEROSPACE MEDICAL ASSOCIATION
Annual Scientific Meeting
San Antonio, Texas
12-16 May 1985

Let's all be there if possible. This is our yearly opportunity to rub elbows with our colleagues in every Service, United States and Foreign country. Our views become a bit parochial at times and this is a chance to broaden our perspective!

NAMI SECRETARY-TREASURER NOTES

Our formal dues year is coming up, with a May 1 deadline. As a reminder, member dues are \$10 and subscriber dues are \$5.

We are currently revising our roster, and would appreciate it if you could remind us whether you are a subscriber or a full member as well as any change of address.

Flight Surgeon Wings are still available at \$1 each. They will be available also at the Aerospace Medical Association meeting.

LCDR CARLOS DIAZ
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-MMD CHANGE 98 -

NAVAEROSPMEDINST didn't get all requested changes into Chapter 15 that we requested, but the following changes are noteworthy:

a. Throughout Chapter 15, BUMED 263 has been changed to NAVAEROSPMEDINST-14: you already have the address.

b. Note that the original typed SF 88, w'ritten SF 93 or 6120/2, plus other required enclosures as needed are to be forwarded to NAVAEROSPMEDINST-14 for endorsement.

c. 15-14(3)(i)(15) adds: *Radial keratotomy* as a cause for rejection for appointment or commissioning USN.

d. 15-36(2)(f) specifies that all diving personnel with *sickle cell hemoglobin* trait (SCT) and matched control subjects -per BUMEDINST 6260.26 series -will have a yearly Diving Medical Exam (DME) within thirty days of their birthday. Please review for details.

e. 15-67(8) specifies that *sickle cell hemoglobin* trait (SCT) 41% or less is not disqualifying for aviation duties. Note that sickle cell disease, anemia or trait greater than 41 % is disqualifying for aviation duties. This test will be performed on *two* consecutive days. If either test is above 41.0%, disqualification applies, NOT the average of the two tests. Annual DME per BUMEDINST 6260.26 series applies. NOTE: SECNAV is considering deleting the 41% restriction.

f. 15- 70(2) changes prostatitis to "proctitis;" please note that in fact a waiver for proctitis can be obtained if asymp-

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NAMINOTES

-AIRCREW CANDIDATE EXAMS! -

Recently, some individuals arriving in Pensacola to begin Aircrew School are found not qualified for the physical training required. Because the aviation environment requires members to acquire and maintain an excellent state of physical fitness in order to function effectively, candidates are required to undergo an arduous physical fitness program at Pensacola. Unfortunately, many who arrive here have been physically inactive or have a medical condition which prevents them from completing the physical fitness requirements. This results in early disenrollment for that individual.

Flight surgeons should counsel each individual considering aircrew training. It should be emphasized that a personal physical fitness program instituted several months prior to arrival in

- EDITORIAL POLICY -

The views expressed herein are those of the individual authors and not necessarily those of the Society of U.S. Naval Flight Surgeons.

This Newsletter is published quarterly by the Society on the first of January, April, July, October. Material for publication is solicited from the members and should be typed double space, reaching the Editor at least one month prior to the scheduled date of publication. Unsigned material will not be considered.

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MMD Change 98 (continued)

tomatic. Azulfidine not exceeding 2 gms per day and Hydrocort enemas/foam are also waivable. Chronic prostatitis requiring long-term antibiotics will require a waiver.

g. *Aviation Weight Standards* are still reported as 20% body fat in MMD 15-70(4). We are still following the weight standards set forth in OPNAVINST 6110.1 B, not those reported in 15-70. *Clinical judgment* continues to be of paramount importance. Routine waivers should be forwarded IAW 15-58(3).

h. 15-70(11), (12), and (13) report the visual acuity limits and refractive error for Service Group I. 20/50 corrected to 20/20 not to exceed -1.25d in any meridian. *Contact Lenses* are prohibited *at all times* for Class 1 personnel.

i. Per letter of Surgeon General, not included in change 98, the following statement was made: whenever corrective lenses are required, the SF 88, Item 75, and upchit 6410/2 are to be annotated with "corrective lenses must be worn while in performance of flight duties." -OR -If uncorrected vision is 20/100 or less, "the member must wear corrective lenses and carry an extra pair in performance of flight duties."

j. *Applicants* must sign a "vision and contact lense statement" when applying for aviation. Change 98, MMD 15-75(2) has added to that statement "eye surgery." Please take note! "I certify that I do not now use, nor have I ever used, contact lenses for any purpose; that I have never undergone any eye surgery; and that I am not aware that my uncorrected visual acuity has ever been less than 20/20."

k. *Search and Rescue Medical Technicians* Medical personnel serving as aircrewmembers must meet the general enlisted aircrew physical standard described in Article 15-77(5). Not those standards prescribed for SAR swimmer in 15-77(9).

l. Please review Chapter 15-78, Examination for and Reporting of Fitness for Flight Duties.

m. Please review Chapter 15-81, Recording and Forwarding Physical Examinations.

(1) Remember, if a member is expected to be grounded in excess of thirty days, a flight physical should be sent to NAVAEROSPMEDINST-14 for endorsement. A certain amount of clinical judgment is required in the determination of whose record will be submitted. We understand that, and concur in, non-compliance for routine situations, but multiple trauma, CVA, MI, HNP, head injuries, and psychiatric treatment are examples of situations not considered routine. In fact, *any condition that warrants a Medical Board* should be submitted with a flight physical, whether found fit for full duty or limited duty.

(2) When a report of a physical examination contains remarks which could be construed as damaging or might jeopardize an examinee's career in aviation, it is mandatory that it bear the signature of the senior medical officer present. In addition it is recommended that such situations be reviewed by the individual's COMMANDING OFFICER (i.e. endorsement).

(3) This section is especially important for DIFDEN personnel. Even though they are not flying, they are administratively held to physical standards for DIFOPS. Their flight pay and future assignments depend upon this information.

-IS HE WEARING CONTACTS? -

There was a recent Marine Corps aircraft accident involving many fatalities in which the pilot was a two-diopter myope and yet his latest physical exams showed him to have 20/20 vision, uncorrected. He was known to wear glasses and contact lenses. He had been performing poorly prior to the accident. Whether his poor performance or the accident were related to his vision will never be known. Flight surgeons should insure that the health record shows that the pilot needs glasses. They should not tolerate contact lens wear by pilots. You may not be able to do it all the time, but the best policy is to check the vision yourself, and do a slit lamp exam at the same time. As you may know, we've had flight student applicants try to remove contact

lenses in the same room that the visual acuity was being checked.

CAPT. P.T. BRISKA

-RENAL STONES-

We have been receiving several queries from fleet flight surgeons regarding kidney stone management in the aviation community. Although in years past there was a blanket rule of grounding for one year after passage of a stone, this policy has been superseded by much more rational management.

The new rules are as follows:

Applicants: If an applicant for flight training gives a history of renal calculus, he should be thoroughly evaluated. This evaluation should include nephrotomograms and IVP. If retained calculi or a metabolic abnormality are revealed, this shall be cause for rejection. A history of more than one episode shall be cause for rejection.

Designated Aviators: Designated aviators who reveal a history of calculus, or who present with an initial episode or have a calculus incidentally discovered should be evaluated with the following tests: 1) Urinalysis to include pH, 2) Urine culture, 3) CBC, 4) Serum electrolytes, 5) 24-hour urine for Ca⁺⁺, PO₄ and uric acid, 6) Serum Ca⁺⁺, PO₄ and uric acid, 7) Plain nephrotomograms, 8) IVP, 9) Stone analysis. If the metabolic work up is negative, and no retained calculi are detected, the aviator may return to *Full Flight Status* (SGI if appropriate): 1) Two weeks after stone passage, 2) Four weeks after stone manipulation, 3) Twelve weeks after open surgery. If the metabolic workup reveals an abnormality, and medication is required, the pilot is to be found NPQ, with waiver requested for medication use (even for hydrochlorothiazide - which requires no waiver when used for hypertension). Waiver approval of a pilot will probably place him in SGIII for three months to assure tolerance of the medication. After three months, if no adverse effects are seen, the local flight surgeon may return the pilot to SGI.

All aviators with a history of calculus should be followed semi-annually with urinalysis, plus other studies as appropriate.

Renal Calculi, in the case of *recurrent disease*, shall be a cause for permanent grounding. For these purposes, "recurrent stones" is defined as *more* than two episodes in one year or *more* than three in five years.

Retained stones may also be a cause for grounding. However, if there is reason to believe after consultation with the urologist and radiologist who have reviewed the films, that the retained calculi are not of a size or position that would suggest movement into the ureter, the aviator may be a candidate for a waiver.

It should be kept in mind that the work up and lab tests described above are not all inclusive, and that on an individual basis you may want to investigate a particular case further. For example, additional studies may include renal and CT scans; parathyroid screen; oxalate, cysteine and citrate screens, or early consultation with a urologist.

-VERTEBRAL FRACTURES-

We frequently answer questions about the disposition of aviators following vertebral compression fractures. This topic was addressed to the Heads of Navy Orthopedic Departments by Naval Medical Command (Code 23 - Captain Lestage,) in 1980. The recommendations received were consistent enough to tease out the following guidelines for your use:

1. Less than 10-15% anterior wedge compression fractures, or *minor* anterior chip fractures may return to unrestricted flight duty when asymptomatic (pain free and full range of motion). Generally, in about *six weeks*.

2. Less than 25% anterior compression fractures requires a minimum of *six months* healing prior to returning to ejection seat or carrier based aircraft. Flying in less than Service Group

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Vertebral Fractures (continued)

I status, Fixed Wing, non-ejection seat, aircraft might be possible after three months.

3. Less than 50% vertebral body compression fractures or large anterior wedge fractures without posterior element involvement requires *one year* healing prior to return to ejection seat. Return to less than Service Group I in fixed wing, non-ejection seat aircraft might be possible after six months. Large anterior wedge fractures may result in kyphotic curves incompatible with return to ejection seat aircraft.

4. 50% compression fractures or greater, those with posterior element involvement, and dislocations are generally considered unstable, necessitating surgical stabilization. These would be disqualifying for ejection seats for *two years*. However, flying in less than Service Group I, non-ejection seat aircraft might be reasonable after one year.

5. In general, all aviation personnel with back trauma are required to be pain free, exhibit a full range of motion, and be off all medication prior to returning to flight status. Waivers should be obtained for all compression fractures noted in items 3 and 4 prior to returning to flight duties. In all cases, the aircrewman must be in a full duty status prior to returning to flight duty.

A discussion would consider, "how long does it take for a given injury or fracture to heal?" Short of performing bone scans, our guidelines provide flexibility in relation to the severity of injury as suggested by three senior Navy orthopedists. These recommendations vary a little from the 'old standard' of one year disqualification following vertebral compression fractures. We believe this did not allow latitude in aeromedical disposition for the vast range of fractures observed or for the type of flying performed. NAVAEROSPMEDINST-14 has therefore followed the aforementioned percentage guidelines for the past couple of years. Remember, ejection forces of 15-25 G's with onset rates of 300 G's/sec are normal; bone scans remain hot for up to two years post compression fracture, and most fractures occur between T9 and L1.

A review of several aviation medicine texts, including Dhenin, Randel and Raymond simply rely on a pain free state and vary time constraints ranging from three to twelve months. Dhenin notes, "once healing has taken place, the damaged vertebrae need not be regarded as weak points in the spinal column." In fact, Raymond reported on six USAF pilots with compression fractures that ejected for the second time, none of which had subsequent injury, and one aviator ejected four times without subsequent injuries. Another important consideration following spinal trauma is the common development of obvious compression fractures seen on X-Ray months to years after initial injury. Therefore, follow-up X-Rays, CT scans and isotope studies may be indicated post ejection for delayed evidence of injury prior to returning to flight duties. Pain may be the only suggestion of the injury initially.

CAPT. J.C. EMERY

-MOTION SICKNESS-

Motion sickness is the "normal" reaction of travelers to a moving environment. Thus, anyone will become sick with sufficient motion and mismatched sensory stimulation. This affliction of travelers has been noted throughout history. The problems caused by motion sickness are numerous as are the implications for safety in flight. The parameters of this illness and its aviation-compatible treatment methodology have, as yet, defied the research efforts of many decades. This discussion will not present an answer but only some of the guidelines for intervention with airsick aircrew personnel.

The Naval Aerospace Medical Institute (NAMI) Department of Psychiatry "inherited" the gatekeeping task of evaluating and treating airsick flight personnel, based upon the presumption that the airsick patient may also have anxiety that elevates his

physiological motion sensitivity. Therefore, a dose of "anti-anxiety/relaxation" might help to settle the proverbial stomach. There is some truth to this assertion, though it is not nearly as simple as it might sound.

There are two basic types of airsickness patients seen at NAMI -the aviation student early in his training, and the designated aviator sent to NAMI TAD by his command. Students are, by far, the most numerous. Depending upon the type of training (Student Naval Aviator (SNA), Student Naval Flight Officer (SNFO), etc.), it is estimated that between 10% and 60% of these students develop airsickness during their first six flights. Ninety-five percent (95%) acclimate spontaneously, provided they are motivated to fly.

Airsick flight students are referred to NAMI by their flight surgeon. Usually the patient has had several flights which have culminated in repeated emesis and related symptomatology such as dizziness, headaches, urinary frequency, fatigue, anticipatory anxiety, etc. Oftentimes, there is a marked degradation in flight performance as well. Scopalmine has been used for three to five flights in an attempt to desensitize by providing flight experience without airsickness. The student's motivation to continue in the flight program is also assessed by the flight surgeon prior to referral.

At NAMI, these patients undergo a detailed psychiatric and psychometric evaluation with specialty consultations to rule out significant disqualifying mental, neurologic or vestibular disorders. Furthermore, a developmental history of motion sensitivity (childhood car or airsickness, avoidance of carnival rides, or adverse reactions to other motion environments) is collected. Equally important, the patient's motivation and aeronautical adaptability are assessed. A very strong, healthy motivation for an aviation career is a necessary requisite for a good prognosis.

Unless the patient is disqualified during this evaluation process, he is then referred to the Naval Aerospace Medical Research Laboratory (NAMRL) Vestibular Sciences Division for testing by trained observers with special equipment and his motion sickness susceptibility (low, moderate, or high) is determined.

Following this testing, a decision is made at NAMI whether to: (a) NPQ the patient for physical/psychiatric reasons, (b) NAA him because of characteristics incompatible with aviation, (c) return him to his command for administrative processing, or (d) recommend him for experimental desensitization by NAMRL or relaxation training at NAMI.

Desensitization by NAMRL is provided on an experimental "as available" basis. Essentially, the highly motivated patient with low anxiety and medium to high motion sensitivity is rotated in a special chair in a progressive series of sessions to dis inhibit motion arousal. This program lasts approximately two weeks and helps the patient gain control and confidence.

Patients with relatively high anxiety and low to medium sensitivity to motion stimuli undergo a course of muscle relaxation and cognitive rehearsal therapy at NAMI. Five sessions are dispersed over two weeks. Patients carry out home assignments and are encouraged to exercise and get involved in activities designed to help them relax and acclimatize to vestibular stimulation without motion sickness.

Upon completion of either or both treatment regimens, the patient is returned to his command for two ungraded trial flights. Based on his inflight performance, a decision is made by his flight surgeon whether or not to recommend retention in the flight training program.

This may all sound simple, but it isn't. Treatment effectiveness, patient adaptation, placebo effects, etc., may be quickly evaluated in the aviator. However, this is more difficult with SNFO's and other aircrew because they often return to flights with low motion stimulation and do not experience much provocation until they get to their operational assignments. Then they wash out! (This obviously can be very expensive for the taxpayer and can compromise squadron effectiveness.)

Motion Sickness (continued)

The evaluation and treatment of designated aviators is more difficult. More experienced and, theoretically, having undergone long hours of motion adaptation, they are less likely to benefit from simple desensitization -and little more than desensitization can be offered at the present time.

These patients may begin to reexperience their airsickness at periods of critical change in their aviation career; for example, motion sensitivity may develop during transition to a different aircraft or mission. Again, applying the analogy of stress-overload-induced airsickness symptoms, the flight surgeon may be well advised to carefully evaluate these aviators. An adequate trial of six or more flights in the new assignment is in order. Patients who remain symptomatic but who show a high motivation for unconditional flight assignments are good candidates for referral to NAMI. These aviators should have strong family and command endorsements to return to their assignment following evaluation and treatment.

Patients with a long history of unremitting motion sickness, questionable motivation, or who do not accept duty assignments willingly (who usually want a permanent shore rotation) are very poor candidates for treatment. These individuals should be handled administratively.

The evaluation and treatment of designated aviators is the same as that for students; but, the prognosis is less certain, despite more careful screening by referring flight surgeons. Salvaging aviators is admirable and desirable; however, the effort must be cost and mission effective. At present, we can give no absolute guarantee that an aviator will sufficiently recover from airsickness to be able to fly safely and effectively, given the limited intervention presently available. A patient with low motivation, a history of chronic motion sickness, very high motion sensitivity, or many hours of flight time with symptoms would not be expected to achieve significant treatment success with the current protocols. Should you have a candidate for our program, please feel free to call us and discuss the prospects - AV 922-4238.

L.I.NAVRADSZKY
Lieutenant, MSC, USN

- SLEEP LOSS FATIGUE -

Fatigue: “A group of phenomena associated with impairment or loss of efficiency and skill, and the development of anxiety, frustration, and boredom.”

**p.20-1 FSM
quoting Ross McFarland**

Either for the purposes of reconstructing an accident sequence, or for use as a teaching aid in the practice of preventive medicine, or as a yardstick to monitor the status of aircrew members, I have many times found the need for a checklist of behavioral phenomena that, in one place, listed harbingers of acute fatigue. I have a folder labeled “Fatigue” containing dozens of articles and references wherein this information is buried. I therefore lay no claim to originality. Below is a melding of McFarland, Mohler, Karney, Winget, et al, and Walker, among others. I am in full concurrence with investigators Price and Holley who stoutly maintain that fatigue as a cause of aircraft accidents, civilian and military, has not been given its just due.

Any nighttime accident sequence needs to be meticulously scrutinized to establish the presence or absence of fatigue clues. A 72-hour history should also signal whether this template should be superimposed without regard for what time the accident occurred. Your conclusion about the causal role of fatigue will be made according to how many factors are identi-

ified and what the proximity to the mishap was. There is no specific number of items required because the template must be applied to dissimilar sequences. However, those elements with an asterisk, in my experience, carry strong weight for retrospective application to an accident you are trying to reconstruct, and commonly occur together. Circadian rhythm disturbance can include all the factors listed here, but still have no identifiable decrement in total sleep duration. The value of that sleep will be compromised because its timing was wrong. Jet lag also includes additional highly significant physiologic disruptions not listed here that become important in less than two time zone crossings and take as many days as zones crossed to resolve. Sleep loss fatigue, on the other hand, is resolved by adequate sleep, sleep that may be available in as little as one night.

TEMPLATE OF BEHAVIORAL ABERRATIONS OF FATIGUE SECONDARY TO SLEEP LOSS:

- * Momentary lapses or “blocks” interrupting performance
- * Short attention span
- * Increased rate of errors
- * Fixating on part of the whole vs. scan
- * Tendency to be careless
- * Acceptance of greater tolerances in instruments and controls
- * Lowered level of overall performance
- * Lowered standard of acceptable performance
- * Less able to accept criticism
- * Accepts unnecessary risks
- * Slow to follow instructions
- * Needs to constantly recheck actions
- * Recent memory impairment; forgetfulness

Unusual preoccupation

Startles easier

Fine tremor of the hands

Tendency to doze

Motor coordination imprecision

Irritability, fault finding, impatience

Subjective fatigue

Tension headaches

More frequent sighing

Sense of discomfort and failure

Lack of group interest

Increased reliance on coffee, alcohol, tobacco

Decreased personal cleanliness

Decreased libido

Decreased activity level

Anxiety

CAPT. FRANK E. DULLY, JR.

WEED WACKER

Although many of our Naval Aviators have quit smoking successfully, there are many who have tried only to discover the awesome hold of the weed. Most are aware that cigarettes increase their risk of lung cancer. Some may be unaware of other diseases associated with smoking: heart attacks, emphysema, atherosclerosis, peptic ulcer disease, and cancers of the tongue, mouth, and larynx. A less common syndrome is “tobacco amblyopia” which is characterized by neural (not refractive) decrease in visual acuity which may progress to optic nerve atrophy. The relation between cigarettes and other illnesses (e.g. bladder cancer) is suspected but less well demonstrated. Most smokers are aware that cigarettes reduce their stamina; it only takes a few laps around the track to prove this. However, Flight Surgeons and Physiologists should also emphasize

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the decrement in night vision, "g" tolerance, and fine motor skills, since this is the stuff that separates the aviator from the groundlings. Also, smoking impairs the health and performance of the maintenance personnel who perform *critical* (as in life or death) tasks on the aircraft, frequently under difficult or dangerous conditions. Helping aviation personnel to stop smoking is preventive and occupational medicine at its best. Commanding and Safety Officers should also be interested in minimizing the loss of personnel from this preventable cause.

In addition to nicotine, tobacco smoke contains over 500 compounds including carbon monoxide, volatile acids, phenols, and tars. Carbon monoxide is particularly important to aviators since it binds with hemoglobin, decreasing oxygen delivery to the tissues. Regular smokers may have 5-10% of their hemoglobin so bound. This is comparable to donating a unit of blood the day before flying. Many studies have addressed the question of whether smoking is a physical addiction or a psychological dependence. Tolerance to the effects of nicotine is well documented. Any ex-smoker will tell you that the craving for cigarettes persists long after the physical withdrawal syndrome.

Education and exhortation alone have been inadequate for many who wish to quit smoking. Recently nicotine resin chewing gum (nicorette) has become available in the U.S. Several independent investigators have demonstrated the efficacy of nicotine gum in aiding smokers in their attempt to quit. However, the gum is only an adjunct to a stop smoking program. Experience indicates that the combination of individual counseling, group support, and nicotine gum is most effective. The U.S. manufacturer, Merrell Dow, provides "physician's guides" to assist in establishing group programs. Although initial participation by health care professionals is extremely important, these groups can continue with minimal supervision, similarly to Alcoholics Anonymous groups, which may occasionally invite health care professionals as speakers, but generally function quite well without professional assistance. Regular aerobic exercise, either individually or in groups, may also aid in the program, although persons with medical problems should consult their physicians first.

Although the use of medication by personnel on flight duty is generally to be avoided, Flight Surgeons may wish to permit use of nicotine gum by aircrew. The gum has been extensively studied in Europe, although not in aviators. However, studies indicate that the gum produces lower plasma nicotine levels than cigarettes and smokeless tobacco (snuff and chewing tobacco). Also, the gum does not contain the many other harmful substances found in tobacco smoke, especially carbon monoxide which is known to cause demonstrable decrement in performance. Since many aircrew smoke while briefing and flying, it can be argued that by prescribing nicotine gum, the physician is removing and decreasing the foreign substances rather than introducing a new substance into the flyers' bodies. As with any other medicine, the patient must be counseled on the potential effects of the drug. Most smokers are familiar with the effects of nicotine. However, sore jaw muscles, throat irritation (usually mild), and hiccups are not uncommon with use of the gum. Complete prescribing information is available in the package insert or the Physician's Desk Reference.

In summary, nicotine chewing gum is an effective adjunct to a smoking cessation program. Its use by aircrew should be considered only with proper supervision by the prescribing Flight Surgeon in accordance with paragraph 722 of OPNAVINST 3710.7. "Stop smoking" groups, once established, can continue to aid the ex-smoker in maintaining abstinence. Command support for such efforts can be expected to pay dividends in enhanced health and performance, and decreased lost workdays due to smoking related illness. Finally, motivated individuals, who have failed in previous attempts to quit smoking, have a

better chance to quit permanently.
(References on request)

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ON THE LIGHT SIDE

(The following article, while on the light side, is not meant to make light of the subject of aviation safety)

While doing some diligent research on aviation safety this media item of trivial, but general, interest was uncovered.

It appears that bird strike hazards and problems with aircrew not using good headwork when flying may sometimes be related and are not limited to military aviation. The Oakland Tribune for 10 Feb 1985 reports that numerous motorists along the city's freeways are experiencing bird strikes, primarily from robins. The city's safety folk investigated the problem and came up with the cause of these mishaps. It seems the birds eat the poisonous berries of the pyricantha plant which grows along the freeways, and in their intoxicated condition fly into the paths of automobiles. In order to prevent our errant, fine-feathered friends from challenging U.S. Navy aircraft for airspace by engaging in a life-or-death, drunken game of airborne "chicken," I propose that we eliminate the problem by chopping down all the pyricantha bushes in the area of naval bases or low level navigational routes. Alternatively, we could plant enough pyricantha bushes that the birds would be so drunk they could never get off the ground.

All humor aside, mixing drugs and flying is not even for the birds, much less humans.

JERALD B. FELDER
Captain MC USN

BIENVENIDOS

The Mexican Association of Aviation Medicine has invited all members of the Society of U.S. Naval Flight Surgeons to attend and participate in the XXXIII International Congress of Aviation and Space Medicine. Meeting to be held in Guadalajara, Jalisco, Mexico October 20-24, 1985. The Meeting will be held at the Hyatt Regency Hotel with additional rooms available at the Plaza del Sol Hotel. For additional information, write to the Organizing Committee of the XXXIII International Congress of Aviation and Space Medicine, Apartado Postal 39-201-15620, Mexico, D.F., Mexico.

SOCIETY OF U.S. NAVAL FLIGHT SURGEONS NOTES

Let's have a good turnout for our *Annual Meeting*. Meeting will be held at 5 p.m., Sunday, 12 May 1985. The location of the meeting can be ascertained by searching the lobby of the Convention Center for a Notice. *New members and those wishing to join the Society are welcome.*

Also, let's all attend the Navy Luncheon on Monday and Honors Night Banquet on Thursday evening. See you there!

