



DEPARTMENT OF THE NAVY
CHIEF OF NAVAL AIR TRAINING
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CNATRAINST 6410.2A
00X2
6 Jan 2015

CNATRA INSTRUCTION 6410.2A

Subj: AIRSICKNESS MANAGEMENT PROGRAM

Ref: (a) CNATRAINST 1542.61L
(b) CNATRAINST 1542.140D
(c) CNATRAINST 1542.154A
(d) CNATRAINST 1542.155C
(e) CNATRAINST 1542.165A
(f) CNATRAINST 1542.166A
(g) OPNAVINST 1542.4D

Encl: (1) Airsickness Notification Form
(2) Airsickness Tracking Form
(3) Preprinted SF-600; Medical Evaluation of Motion
Sickness
(4) Aircrew Rotational Training (ART) Procedures
(5) Airsickness Review Board (ARB)
(6) Airsickness Handout

1. Purpose. To provide the airsickness (AS) policy, procedures, and documentation for all CNATRA Flight Training Squadrons in order to manage aviators who experience AS, per references (a) and (f).

2. Cancellation. CNATRAINST 6410.2

3. Background. AS, one form of motion sickness, is a common problem for aviators upon entry into flight training. AS is a normal physiological response to abnormal motion and is generally considered to be a mismatch of vestibular, proprioceptive and visual sensations. AS may interfere with progression through the flight training. Symptoms may recur after long periods of non-flying, transition to more challenging flight maneuvers or aircraft with enhanced flight characteristics. Most aviators adapt to the flying environment quickly while others may require additional assistance to allow them to overcome symptoms of AS. Recommendations to help aviators prevent and manage AS include early intervention with education, training, and, if necessary, pharmacological and physiologic therapies. There are primarily two types of AS;

"passive AS" is associated with nausea and other discomforting symptoms but without vomiting and "active AS" is characterized by vomiting. Passive AS, for the purpose of this instruction, shall be managed in the same manner as active AS, if the aviator's discomfort or nausea results in deviation from mission profile or affects the aviator's ability to complete tasks. Mild nausea that does not affect the aviator's ability to safely and satisfactorily complete the sortie shall be considered not significant.

4. Discussion. The following operational and medical procedures are designed to provide individual attention and a reasonable opportunity for aviators who experience AS to adapt to the flying environment. Operational and medical personnel must strive to keep aviators motivated and flying on a regular basis. Aviators who experience recurrent symptoms of AS, whether active or passive, shall be placed in the Airsickness Management Program (AMP). Instructor Pilots (IPs), Flight Surgeons (FS), and Aeromedical Safety Officers (AMSOs) shall actively assist aviators in avoiding AS during the earliest phases of flight training. However, aviators who experience AS must still meet Maneuver Item File (MIF) standards in order to continue flight training. Aviators shall be graded against the course training standards, regardless of the impact of AS.

5. Action. The following areas of responsibility are assigned:

a. Chief of Naval Air Training (CNATRA) shall implement policy in consonance with the intent of this instruction, to ensure maximum training safety and effectiveness through standardized procedures regarding the management of AS in the flight-training environment.

b. Training Air Wing Commanders shall:

(1) Implement the AMP within Training Air Wings that conduct flight training. This training shall be placed under the cognizance and oversight of assigned FS and/or AMSO for aviators who experience significant problems with AS.

(2) Through the use of the AS Review Board (ARB), make the final determination when an aviator should be removed from training for reasons of persistent or recurrent AS.

c. Squadron Commanding Officers shall:

(1) Refer SNAs/SNFOs for participation in the AMP when appropriate and as outlined in this instruction.

(2) Not schedule a SNA for a solo flight who has been actively or passively airsick on the preceding training mission.

(3) Ensure aviators assigned to AMP have priority scheduling and shall fly or participate in additional ART daily until the aviator has fully overcome AS challenges or has completed the Precision Aerobatics Phase, whichever occurs first.

(4) Convene an AS Review Board (ARB) as outlined in this instruction or when deemed appropriate.

(5) Designate at least one experienced IP to serve as a squadron AS representative. This IP shall receive training from the Airsickness Management Program Manager (AMPM). This IP should be scheduled with AS students following the students' completion of ART.

d. Instructor Pilots shall:

(1) Provide at risk aviators assistance in overcoming AS. Early in primary training, the IP may assist the aviator in momentarily taking control of the aircraft, or if necessary, terminating the mission. During adaptation flights the IP shall not perform any flight maneuvers beyond the aviator's current syllabus flight. In the case where adaptation flights are performed in aircraft other than the aviator's current training aircraft, every attempt should be made to ensure these flights do not contain flight maneuvers that are beyond the capability of the aviator. Aggressive or more advanced maneuvers may actually contribute to the aviator's AS, rather than help alleviate AS. As the aviator progresses in training, IP assistance should be decreased.

(2) Document all episodes of AS in the comments section of the Aviation Training Form (ATF). The sortie shall be graded "complete" or "incomplete" per Multi-Service Pilot Training System (MPTS) or Multi-Service Navigator Training System (MNTS) guidelines.

(3) Complete Section A of the AS Notification Form on all SNAs/SNFOs who experience AS after the first two graded sorties or after the second episode of AS and provide it to the aviator.

e. Aviators Shall:

(1) Disclose all episodes of active and significant passive AS to the IP or Instructor Navigator (IN) for documentation purposes.

(2) Report for all scheduled training components of AMP. Participation in Phases II through IV of the AMP is voluntary. However, failure to participate may call into question the aviator's motivation to succeed and may contribute to the aviator's attrition due to persistent AS.

(3) Maintain in "mini Aviation Training Jacket (ATJ)" copies of enclosures (1) and (2) of this instruction subsequent to any mandatory FS evaluation resulting from AS.

(4) Upon receipt of an IP/IN completed AS Notification Form, report to the Student Control Office to update a "master" AS Tracking Form to be maintained in the aviator's ATJ.

(5) Maintain current and accurate copies of AS Tracking Form if airsick after the first two training flights or after the second episode of AS.

(6) Hand carry AS Notification Form with Section A completed by the IP/IN and a current copy of the AS Tracking Form to medical for all required FS evaluations.

(7) Return the completed AS Notification Form with FS comments and recommendations to the squadron for consideration prior to scheduling subsequent training events.

f. The AMSO shall: Assist in conducting the AMP, especially as it applies to physiologic adaptation which includes providing the AS brief to all incoming aviators, ART (spin chair training), and airsickness mitigation techniques. Information the AMSO gathers is particularly important as it relates to the identification and elimination of AS causal or aggravating factors.

(1) As the Airsickness Management Program Manager (AMPM), be ultimately responsible for diagnosis and treatment of all AS cases. Coordinate, along with the FSs, the implementation of all phases of the AMP.

(2) Participate in ARBs.

(3) When operationally feasible an AMSO qualified in the aviator's aircraft, in accordance to ref (g), should perform the first post-ART flight.

g. Flight Surgeons shall:

(1) Provide initial and follow-up medical evaluations, treatment, counseling, and referral for aviators involved in the AMP, as required.

(2) Coordinate with the AMSO, in order to assist in the implementation of all phases of the AMP.

(3) In the absence of an AMSO, act as the AMPM and be ultimately responsible for diagnosis and treatment of all AS cases.

(4) Provide feedback and AS management recommendations to the aviator's squadron utilizing Sections B and C of enclosure (1).

(5) Make appropriate Health Record (HR) entries on enclosure (3).

(6) Participate in ARBs.

(7) Perform grounding physicals, when appropriate, on aviators determined to be Not Physically Qualified (NPQ) for aviation duty for reason of intractable AS.

(8) When operationally feasible a FS qualified in the aviator's aircraft in accordance to reference (g) should perform the first post-ART flight.

6. AS Management Procedures for Aviators

a. PHASE 0: AS AWARENESS BRIEF. Prior to initial aerial training, aviators shall receive an AS awareness brief that includes the cause, prevention, management, safety implications, and potential training impact of AS on flight training. To assist in providing individual educational assistance, an "AS Handout", enclosure (6), is provided to be utilized, as needed.

b. PHASE I: FLIGHT SURGEON EVALUATION

(1) A FS evaluation is required after any aviator's second episode of AS or for each occurrence after the completion of the first two graded sorties. Aviators who experience significant AS after the first two graded sorties shall consult a FS as soon as practical. Aviators who experience severe AS symptoms or incomplete a sortie due to AS shall see the FS prior to being scheduled for a subsequent graded flying event. This evaluation shall be documented in the aviator's medical record, enclosure (3), by the FS. Aviators who require and receive this initial medical evaluation for AS shall be formally entered into the AMP. While participating in the AMP, aviators will continue normal syllabus flow to include flying unless otherwise prohibited by this instruction.

(2) The purpose of the FS evaluation is to determine if the aviator's symptoms are physiologic or due to other causes. The FS should ascertain if the AS preventative measures presented in Phase 0 were followed. Additionally, the FS should assess the members Aeronautical Adaptability (AA), motivation to fly, and special circumstances such as anxiety, stress, and other predisposing factors. Counseling or medical treatment may be needed at this time. The FS may require the aviator to meet with AMSO for counseling which will include proper diet/food considerations, stress management, in-flight aids, breathing techniques, slow, deliberate head movements and relaxation techniques.

(3) Referral of the aviator by the FS or AMSO for behavioral health counseling and/or training should be considered at any point during phases II through IV. Referral consideration should be based on severity of the AS problem and impact on quality of training and safety of flight. Other concerns include the individual needs and desires of the aviator and the availability of local resources to provide the training. Behavioral health training could include, but not be limited to, some or all of the following entities:

- (a) Stress Management
- (b) Progressive Muscle Relaxation
- (c) Relaxation Breathing
- (d) Biofeedback

c. PHASE II: MEDICATION:

(1) The FS shall evaluate aviators who experience their second episode of AS, or AS after the first two graded sorties. During this visit medical suppression of AS symptoms should be considered, but not required. Medication is restricted to aviators flying in the pre-solo phase of training. Aviators participating in training sorties that are medicated for AS shall communicate this intervention to their IP/IN utilizing the AS Notification Form. Medication shall be discontinued prior to C4201 for T-34s and C4204 for T-6Bs and I-4004 for NFOs. Aviators should be dispensed an adequate supply of medication so that a ground test dose of the medication can be used prior to the next training sortie. Ground testing of medication effects will allow for observing possible reactions to the medication, unacceptable side effects, or the need to adjust medication dosage. For purposes of the medical management of AS symptoms, the following medications should be utilized:

- (a) Phenergan, 25 mg tablets, 1 tablet by mouth 1 hour before flying, or
- (b) Scopalamine 0.4 mg tablets, 1 tablet by mouth 1 hour before flying.

WARNING:

(2) Antiemetic agents listed above shall not be used as a sole agent in the treatment of AS. When one of the above medications is utilized for the prevention of AS, it shall be used (unless contraindicated) in conjunction with one of the following medications:

(a) Ephedrine 25 mg tablets, 1 tablet by mouth 1 hour before flying, or

(b) Dextroamphetamine 5 mg tablets, 1 tablet by mouth 1 hour before flying

(c) Provigil(modafinil) 100-200 mg, 1 tablet by mouth 1 hour before flying

d. PHASE III: AIRCREW ROTATIONAL TRAINING (ART).

(1) Aviators who demonstrate persistent or recurrent AS symptoms should be referred to the AMSO for evaluation and considered for ART. The intent of this program is to provide physiological adaptation utilizing the Barany Chair.

(2) Aviators shall not be scheduled for training flights while assigned to ART. Students involved with simulator training may participate in ART following a simulator event. After completing ART, it is imperative to overcoming AS that pilots have priority scheduling and fly daily until it is determined the aviator has adapted to the flight environment. Completion of precision aerobatics without significant AS symptoms is a good indicator that the aviator has adapted to the flight environment. Aviators in advanced training will be managed on a case by case basis. TW-1 and TW-2 should consult with the CNATRA AMSO in these situations.

Following ART completion, aviators should be afforded opportunities for adaptive rotational training on an as needed basis following extended periods of time out of the cockpit or whenever scheduled flight events are canceled due to weather or maintenance.

e. PHASE IV: ADAPTATION FLIGHTS

(1) Adaptation flights may be available to aviators at the discretion of the AMPM, FS, ARB or AMSO. On a case by case basis, non-syllabus adaptation flights can be conducted simultaneously with ART. If adaptation flights are performed in aircraft with three or more aircrew positions, and the aviator is not actively functioning as aircrew, ART can be conducted prior to adaptation flights on the same day. Ideally, an adaptation flight should be conducted prior to an ART session.

(2) Adaptation flights should be conducted by the squadron AS IP, or AMDD AMSO/FS when available, and consist of daily scheduling of syllabus events whenever possible on consecutive training days. If an aviator is unable to fly on consecutive days due to unforeseen circumstances, ART shall be used to supplement the adaptation flights. Ideally five consecutive flights should be completed, but adaptation flights can be as few as two if an aviator shows a pattern of adaptation characterized by daily improvements in their physiological response to ART and completed flights.

When syllabus events are not available, Commanders should utilize any available resource to accomplish this phase of adaptation to include rear cockpit flight time. Adaptation flights involving non-syllabus events shall not be utilized as an opportunity for the aviator to improve flight or other aviation skills proficiency, but rather to provide the aviator with additional exposure to the flight environment. Adaptation flights shall be documented on the AS Tracking Form enclosure (2). Enclosure (2) shall be used by the aviator to track their physiological response to the flight environment.

(3) The fundamental rationale for this phase of adaptation is that actual flying is the most effective remedy for AS. It is important that adaptation flights, if they result in AS, not be utilized to the extent that an aversion to the flight environment is created. Also, the use of adaptation flights should not adversely diminish training resources or degrade the unit's overall training mission.

(4) A "favorable response" to adaptation flights is considered to be a decrease in the frequency and severity of active or passive AS symptoms. Aviators demonstrating a favorable response to adaptation flights will continue normal syllabus flow. Phase III training can be repeated or used in conjunction with other phases of AMP training, on an as needed basis, to facilitate adaptation.

7. AS Review Board. After a pilot's third episode of AS post initial solo or a NFO's third episode post initial INAV, an ARB shall be convened to determine the aviator's fitness for retention. It is possible that an aviator who has overcome airsickness and completes primary flight training may display AS symptoms once again in future training. In these cases, an ARB is not required until after their second significant airsickness episode during that follow-on training.

An ARB may be convened at any time by the Commanding Officer whenever an aviator experiences persistent, severe, or recurrent AS. The conduct, composition, and potential outcomes of the board are described in enclosure (5). If the aviator is returned to training and again experiences AS, the board will be reconvened not later than the third episode of AS post previous ARB to reconsider the matter. Returning an aviator to training after a second ARB requires the Wing Commander's concurrence.

8. Advanced Pipeline AS. Aviators in advanced phase of flight training shall be referred to the FS after each episode of AS to rule-out underlying medical etiologies of AS or to identify and correct predisposing causes. This FS evaluation shall be documented in the aviator's health record. Symptoms, in some cases may be attributable to the aviator's transition to a higher performance aircraft and in this case a reasonable period of adaptation is warranted. Use of AS medication is prohibited in advanced flight training. Utilization of adaptation modalities in Phases III and IV of the AMP should be considered for management of AS during this stage of training. After the third consecutive episode of AS or the fifth episode in any one phase of advanced flight training an ARB shall be convened to assess the aviator's potential for successful completion of the program, as outline in enclosure (5).

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9. Disqualification for AS. Aviators who cannot overcome AS shall be processed for attrition according to parent service or country directives. Aviators who experience intractable AS are Not Physically Qualified (NPQ) for aviation duty. In no case will aviators be granted an AS medical waiver.

D. M. EDGECOMB
Chief of Staff

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<u>AIRSICKNESS NOTIFICATION FORM</u>	
SECTION A. INSTRUCTOR REPORT	DATE
Syllabus Event	
Previous Airsickness (Review Airsickness Tracking Sheet):	
Symptoms during flight:	
IP's name, phone:	
Flight Leader's name, phone:	
SECTION B. Flight Surgeon Comments	Date
Flight Surgeon's Comments:	
SECTION C. Flight Surgeon Recommendations (when applicable):	
(<input type="checkbox"/>) Medication for next training sorties.	
(<input type="checkbox"/>) Adaptation flights (5 consecutive training days) within syllabus if possible. Note: schedule early a.m. if possible.	
(<input type="checkbox"/>) Referred to Aircrew Rotational Training (ART) Note: syllabus event can be scheduled on a.m. of 3 rd or 4 th day of training prior to ART	
(<input type="checkbox"/>) Refer to Airsickness Review Board	
(<input type="checkbox"/>) Other	
Aviator's Name/Squadron:	
Flight Surgeon's Name/stamp:	

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Enclosure (1)

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Enclosure (2)

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MEDICAL RECORD	CHRONOLOGICAL RECORD OF MEDICAL CARE
DATE	SYMPTOMS, DIAGNOSIS, TREATMENT, TREATING ORGANIZATION <i>(Sign each entry)</i>

Subjective:

Vital Signs, PMHx, Meds, and AS tracking sheet (If applicable) reviewed Y / N

Physical exam

HEENT:

TM:

Neuro: Cranial nerves:

DTR's: Strength/Sensation: Gait:

Cerebellar function: Rapid alternating movements: Heel-shine-toe:

Finger to nose: Romberg: Tandem

Romberg:

A: AS evaluation #

P: Give patient AS handout, reassure, review diaphragmatic breathing, relaxation techniques, and diet.

Medication

Phenergan 25mg PO 1 h before flying (#) _____

Ephedrine 25mg PO 1 h before flying (#) _____

Dexadrine 5mg PO 1 h before flying (#) _____

Scopolamine 0.4mg 1 h before flying (#) _____

Provigil 100-200 mg 1 h before flying (#) _____

Adaptation flights:

Aircrew Rotational Training; INITIAL REMEDIAL

Referral to AS Review Board

Follow up with FS for each episode of AS

Other:

HOSPITAL OR MEDICAL FACILITY	STATUS	DEPART./SERVICE	RECORDS MAINTAINED AT
SPONSOR'S NAME	SSN/ID NO.	RELATIONSHIP TO SPONSOR	
PATIENT'S IDENTIFICATION: <i>(For typed or written entries, give: Name - last, first, middle; ID No or SSN; Sex; ;Date of Birth; Rank/Grade.)</i>		REGISTER NO.	WARD NO.

CHRONOLOGICAL RECORD OF MEDICAL CARE

Medical Record

STANDARD FORM 600 (REV. 6-97)

Prescribed by GSA/ICMR

FIRMR (41 CFR) 201-9.202-1

AIRCREW ROTATIONAL TRAINING (ART) PROCEDURES

1. Program Overview:

Aircrew Rotational Training (ART) is a program designed to help aviators overcome susceptibility to AS. Each day of training, the aviator identifies AS symptoms and develops control measures while building confidence in ability to overcome AS. Aviators can be referred to ART by the FS or the AMSO per this instruction.

2. Aircrew Rotational Training:

a. Introduction. This is a voluntary multi-day program with training sessions lasting 30 minutes to an hour. Aviators participating in this program shall not fly after spinning. All scheduled syllabus flight events for any given crew day shall be completed prior to spinning. Simulator events may be conducted after an ART event as long as the student is free from AS symptoms. This enclosure contains several tables to be used as follows:

Table 1, Physiology Questionnaire. Aviator completes during Check-in with the squadron FS.

Table 2, Subjective AS Rating Chart. Used to record aviator's response to duration and stimulus from ART.

Table 3, ART Checklist. Used for standardization in completing all aspects of ART.

b. Aircrew Rotational Training Instructors. When trained by the AMPM, Flight Surgeons, Aviation Medicine Technicians, Aviation Physiologists, and Aviation Physiologist Assistants may perform the duties of ART instructors. The ART instructor should always try to place the aviator at ease when involved with the ART. The goal is to return aviators to the squadron with the skills needed to overcome AS.

Table 1

PHYSIOLOGY QUESTIONNAIRE

(Do not file in NATOPS or Training Jacket intended for AMSO records only)

Name/Rank: _____ Date: _____
Squadron: _____ Phone #: _____
On Wing's Name: _____ Phase of Training: _____
Flight# (e.g. C4001) _____
AS Meds: Yes No
Consistency of Flying: _____

INTERVIEW

1. Number of AS episodes: Active _____ Passive _____
2. Circumstances under which AS occurs:
High G's Negative G's Release from G's
Turbulence Yes No
Fumes Yes No
Aerobatics (Spins, Unusual Attitudes, Inverted, etc.) _____
Time sortie began: _____
Duration of flight until symptoms occurred: _____
IP at controls or you at controls? _____
3. Time last ate: _____ Food eaten: _____
4. Recent illness? _____
5. What do you normally do to keep from getting airsick? How effective? _____

6. Any problems with IP's? _____
7. Childhood history of motion sickness? _____
8. Problems with:
Academics _____
Flying skills (Other than AS) _____
Simulators _____
Briefs _____
Other _____
9. Physical Health/Fitness (for all questions answer how much and any recent changes)
Sleep (hrs/night) _____
Appetite: _____
Exercise (hrs/wk) _____
Tobacco (type) _____
Alcohol (drinks/wk) _____

10. Current status of the following

Mood: Great Moderate Low
Confidence: High Medium Low
Attention/Concentration: High Medium Low
Interests/Pleasure/How do you relax? _____

Energy: High Medium Low
Motivation to fly: High Medium Low
Anxiety as a contributor? _____

How do you handle stress? _____

SYMPTOMS OF YOUR AS

1. Body Temperature: Hot Cold
2. Dizziness (spinning) versus lightheadedness _____
3. Drowsiness / yawning _____
4. Headache _____
5. Pallor/Pale _____
6. Nausea _____
7. Salivation or dry mouth _____
8. Sweating: Hot Cold
9. Weakness _____
10. Efforts to cope, so far: _____
Effective Partially Effective Ineffective
11. Time needed to recover from AS: Hours:_____ Minutes:_____
12. Vomiting: Yes No
13. Change in severity over time: Better:_____ Worse:_____ Unchanged:_____
14. Variation in susceptibility without apparent cause: Yes No
If yes, how: _____
15. Other symptoms or comments: _____

Table 3
AIRCREW ROTATIONAL TRAINING CHECKLIST

1. Introduce the Program to the aviator. ART is a multi-day program with each day lasting about 30 minutes (with the exception of the first which is about 1.5 hours). Day 1 and subsequent days allow the aviator to determine different factors influencing their susceptibility to AS. It also gives them the opportunity to practice methods of reducing AS and techniques used to relax the body. ART training will create aviator confidence that they can and will overcome the challenges of AS. Emphasize that we want them to succeed and care...statistically, they will succeed.

1.1 Interview. Use the Physiology Questionnaire (Table 1) to review the aviator's history. Also, review the following with the aviator.

- How he/she handles stress?
- Married, children?
- Eating habits?
- How many and under what conditions has he/she become sick in the past?
- What does he/she normally do to prevent AS?
- Relationship with IPs (any problems?)
- How has the aviator handled the stress?
- Do they still work out?
- Has aviator always wanted to fly? Does he/she feel pressure from family and friends?
- How does he/she relax?

NOTE: If you think that there may be excessive mental anxiety creating the AS, recommend they schedule stress management training.

1.2. Introduce Prevention of AS.

- a. AS Control Demonstration. Teach the aviator:
- (1) Breathing Techniques
 - (2) Muscle Tensing Exercise

Enclosure (4)

(3) Autogenic and Imagery Skills

(4) Lead Head Movements with Eye Movements

Then have aviator demonstrate the techniques that were discussed.

b. Diet.

- Diet can affect one's susceptibility to AS. Besides adaptation, diet has the greatest impact upon AS. It is advisable not to fly on an empty stomach. Gastrointestinal variability exists among aviators and often dietary trial and error will result in success.
- High complex carbohydrate foods such as bagels, whole grain cereals, brown rice and many others are well tolerated by AS prone aviators. Do not overeat before flying and avoid alcohol the evening prior. Eat 1-2 hours prior to flying.
- A restricted diet can have significant effects on overcoming AS—a short-term sacrifice for a long-term gain. Avoid fatty meats, dairy products, fruits and vegetables with high acid content (e.g., oranges, grapefruit, and tomatoes), and foods that are greasy or spicy the day prior and the day of flying. Maintain good hydration with plenty of water and sports drinks.
- Foods high in protein have recently shown an ability to reduce nausea associated with motion sickness. Natural peppermint oil in hard candies, have also shown an ability to reduce nausea associated with motion sickness.

c. In Flight.

- Lead with the eyes during head movements/clearing turns.

Enclosure (4)

- Slow, deep diaphragmatic breathing; inhale slowly through nose and exhale slowly and fully through mouth such that expansion and contraction is felt in the abdomen wait 1 second and repeat a minimum of 5 times.
- Look outside to avoid a vestibular-ocular mismatch.
- Using an oxygen mask has been helpful for T-34 aviators ingesting exhaust fumes during descent. Extreme caution must be used to prevent emesis with O₂ mask in place. MAX O₂ or emergency setting on the regulator in the T-6 may be effective.
- Position cold air vents towards the face and up the left sleeve.
- Muscle tension/relaxation.
- Imagery ("happy place" or review flight profile and next checklist).
- Incorporate relaxation techniques while chair-flying, especially immediately before a maneuver that commonly makes the aviator airsick)
- Drinking a little iced water reduces dry mouth and a little poured on the neck stimulates the sympathetic nervous system reducing symptoms of AS. Too much water could activate the LPU inflation.

2. AS aviator's Responsibility.

- Read and understand the airsickness handout (encl. 6).
- Properly prepare for the flying environment by sleeping, hydrating, and eating as directed in the AS handout.
- Attend the scheduled ART sessions at the designated training lab.

3. Admin Requirements, Equipment and Supplies.

Barany chair

Timing Device

Individual ART Folder

- 1) Copy or Original referral by FS
- 2) Aviator Rotational Training Questionnaire (Table 1)
- 3) Subjective AS Rating Chart (Table 2)
- 4) Aircrew Rotational Checklist (Table 3)

AS Prevention Techniques (Table 3)

Subjective Rating Chart (Table 2)

AS Emesis Bags

4. Subjective AS Rating Chart. The chart (Table 2) is used to track the aviator's response to duration and stimulus. It allows the aviator to classify their discomfort level.

- Number 1 through 4 indicates low arousal not interfering with flight.
- Number 5 through 7 indicates medium arousal that will cause the aviator to deviate from planned flight, e.g., causing the aviator to transfer flight control to the IP.
- Numbers 8 and 9 indicates incapacitating passive AS.
- Number 10 is marked if the aviator becomes actively sick.

5. Day One Protocol (Diagnostic Phase). The primary objective for day one is to get to know the aviator, the history of their problem, and observe their reaction to ART. ART instructor should be observant for personal behavioral patterns and physiological/psychological symptoms in relation to AS.

Enclosure (4)

IMPORTANT

The following are only guidelines. The spin should be tailored to the individual, stopping the spin if the aviator approaches becoming actively airsick.

5.1. Day 1, Spin 1 (eyes closed - recommended). During this spin, the intent is to assess the aviator's susceptibility to motion without visual inputs and establish a baseline. This will allow the aviator to experience the symptoms prior to emesis. For example, inform the aviator that they are pale, sweating, flushed, etc. This allows them to acquiring knowledge of what is happening to their body just prior to emesis. Review subjective scale of AS.

IMPORTANT

Prior to spinning, have aviator place an AS bag in their flight suit pocket, so the bag can easily be reached and used, if needed.

- Aviator spins with eyes closed.
- Spin rate is 12 rpm.
- Spin direction is any direction.
- Spin for ten (10) minutes. Stop the spin if the aviator approaches the feeling of becoming actively sick.
- Make a note of any objective symptoms(sweating, pallor, etc.).
- At every 30 second interval, record on the Subjective AS Rating Chart (Table 2) the level of discomfort.
- The aviator will perform head movements as listed on (Table 2).
- Practice the AS mitigation techniques described in this instruction (Table 3).
- Upon completion of Spin 1, discuss with the aviator their subjective symptoms and any objective symptoms.

Enclosure (4)

Give the aviator a ten-minute break before Spin 2.

5.2. Day 1, Spin 2 (eyes open): Before spinning, review techniques to combat AS. Teach aggressive deep diaphragmatic breathing (see table 4) and have them demonstrate proficiency before spin:

- Inhale slowly through nose for three seconds, pause three seconds after inhaling, slow three second exhalation through mouth in a manner which causes the stomach to protrude.
- A good set is 3-4 breaths; use sparingly; quality of breathing, not quantity, is important
- At levels 1-3, slow deep diaphragmatic breathing
- At levels 4-5: Imagery ("happy place" such as a favorite picture or envision performing next maneuver or checklist), muscle tension/relaxation ("drop-offs")

Aviator is spun with eyes open in same direction as Spin 1.

Spin rate is one revolution every 2-3 seconds.

Spin for ten (10) minutes.

Make a note of any objective symptoms (sweating, pallor, etc.).

Record on the Subjective Airsickness Rating Chart the level of discomfort at every 30 second interval.

Do not allow the aviator to become "active."

Conduct maneuvers as depicted on (Table 2).

After completing Spin 2, discuss with the aviator their subjective symptoms and any objective symptoms.

Enclosure (4)

- Discuss proper breathing, eye fixation/leading with eyes to limit motion input, and the drop-off maneuver.
- Give the aviator a ten minute break while they remain in the chair.

5.3. Day 1, Spin 3: Repeat Spin 2, but spin in the opposite direction. Schedule appointment time for the next day's session.

6. Day Two and Subsequent Days Protocol. The aviator gets two ten-minute spins in the chair. The primary objective of day two is to reinforce the aviator's understanding of symptoms that precede uncontrollable AS. As the aviator progresses, the rotational rate should be increased.

- Practice deep diaphragmatic breathing.
- Practice "Drop-Off" maneuver technique.
- Practice progressive muscle relaxation.
- Require the aviator to control their arousal level.
- Spin rate is one revolution every 2-3 seconds.
- Alternate direction of spins.
- Spin for two ten minute Spins.
- Make a note of any objective symptoms.
- After completion of the Spins, discuss with the aviator any subjective symptoms and any objective symptoms.
- While remaining in the chair, give the aviator a ten minute break before you begin the next spin.
- Repeat the previous steps for the subsequent Spins.
- Set appointment time for the next training session.**

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Enclosure (4)

AIRSICKNESS REVIEW BOARD (ARB)

1. Definition: An ARB is a special Training Review Board convened to assess an aviator's potential for successfully completing the flight training syllabus in light of significant AS problems and to make a recommendation to the Commanding Officer regarding attrition or retention for persistent AS.

2. Convening Authority: Commanding Officer

3. When ARB should be convened:

a. When an aviator fails to demonstrate an "adaptive pattern" to the flight environment, such as no demonstrated incremental subjective or object decrease in the frequency or severity of AS symptoms during participation in any two phases of the AMP.

b. After the third episode of active or passive AS following previous ARB.

c. After recurrent or persistent AS symptoms are recognized in an aviator in advanced flight training defined as three consecutive episodes of AS on successive training sorties or five episodes in any one phase of training.

d. Whenever the Commanding Officer deems necessary.

4. Composition of the Board:

The board shall consist of two to four instructors (Operations and Student Control should be represented) of the same training squadron, a FS, and the AMSO when possible. The senior line officer shall preside as Senior Member of the Board and be senior in rank to the aviator who is the subject of the board. The Senior Member of the Board shall be responsible for all board proceedings. At least one member of the board shall be of the same military service as the aviator. In the case an International Military Aviator (IMS), the Country Liaison Officer (CLO), if one is assigned, and/or the unit International Military Student Officer (IMSO) should attend as a non-voting board member. Potential members include the student's on-wing, flight leader, personal advisor, or other instructor familiar with the case.

5. Charter of the Board: Evaluate the student's potential for successful completion of the program in light of the current AS problem. Issues to consider include:

- a. Presence or absence of physical or psychological impediments
- b. Motivation
- c. Flight proficiency (airwork)
- d. Intellectual ability (headwork)
- e. Special circumstances, such as stress, anxiety, study habits, history of motion sickness, etc.
- f. Human Factors
- g. Safety of flight
- h. Frequency and severity of AS symptoms
- i. Were applicable AS guidelines followed in accordance with this instruction?

6. Potential Recommendations to unit CO, based on majority vote:

- a. Attrition for persistent AS
- c. Retention with limitations or specifications

7. Attrition: Attrition from flight training for reason of AS shall be handled in accordance with the medical or administrative directives of the parent service or country.

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AIRSICKNESS HANDOUT

AIRSICKNESS

1. Airsickness is the result of conflicting sensory input between the visual and vestibular systems. Common signs and symptoms usually progress from stomach awareness, lethargy, apathy, sweating, salivation, drowsiness, and headache to vomiting. Airsickness is a common problem encountered in aviation training that historically has affected 60% of student pilots to some degree. Airsickness will usually abate with continued and consistent flying.
2. Prevention and treatment of airsickness.

a. **Pre-flight Prevention.**

(1) Diet and Hydration. Maintaining a balanced diet is essential for overall wellness. Eating bland food with adequate carbohydrates and protein an hour before flying is advisable. Until you determine what works (or does not work) for you, **avoid:** greasy, spicy, fatty foods, acidic foods (oranges, tomatoes or lemons), and dairy products. Avoiding dairy products means not only milk on your cereal, but also no cheese or mayo on your sandwich. Maintain proper hydration with juice, water or a sports drink. Take and consume water on training flights.

(a) **Dairy Products: Do NOT use milk** on your cereal. Milk and other dairy products are high in fat which take longer to digest. Milk has the tendency to exacerbate “stomach awareness” symptoms potentially aggravating airsickness arousal level. Also, stay away from any food or drink that has a high acidic content. Additional acid is not needed in your stomach. The primary purpose of this particular diet, one to two hours prior to flight, is to reduce/minimize the amount of stomach acid. Use your better judgment when adding new/additional foods to your “before flight” menu.

(b) **Sources of Complex Carbohydrates.** This is a *suggested* list; there are many other foods high in complex carbohydrates.

1. Grits, oat cereals with no milk, whole grain cereals, pancakes, waffles, French toast, muffins, bagels.
2. Pasta, without sauces (tomato sauce is high in citric acid).
3. Crackers, popcorn, pretzels.
4. All vegetables, especially peas, beans, lentils, corn, lima beans, potatoes, sweet potatoes, and squash; unless they cause **excess gas**.
5. Juices, non-acidic only (like apple). No lemonade, orange or tomato juices.
6. Any sandwich combination is good; however, do not use mayonnaise, spicy pepper, spicy mustard, or cheese.

(2) Rest. Eight hours of uninterrupted sleep is recommended the night prior to flying.

(3) Ginger. Ginger root tablets can create a gastrointestinal relaxation effect that helps prevent airsickness and have no adverse medical side effects. Also, they have been approved by the flight

surgeons. Recommended minimum dosage is one 250 mg tablet with dinner, one tablet with breakfast, and one tablet prior to walking to the aircraft. Since ginger taken alone can be harsh, tablets should always be taken with food. Total daily intake of ginger is limited to 4 grams per day.

(4) Peppermint. Natural peppermint oil also creates a gastrointestinal relaxation effect. Eating peppermint candy before flight can help settle the stomach.

(5) Anxiety. Proper preflight preparation with studying and chair flying will help decrease anxiety. The NASWF Fleet and Family Support Center provides stress management classes that have proven successful in treating anxiety associated with airsickness.

b. In-Flight Management.

- (1) The complex instrument package of the T-6 draws attention to the flight instruments during flight. To become a better pilot and avoid the vestibular-ocular mismatch that causes airsickness, students should employ an outside scan by placing the center of the HUD (blue line that occurs at the overlap of the two HUD panes) on the horizon. Keeping the head steady when possible while scanning only with the eyes can be a helpful technique to minimize coriolis and nausea. Make smooth control and head movements, since abrupt movements can incite sensory mismatch. The following T-6 maneuvers should be planned to be conducted in a manner that can be performed to provide maximum recovery time.
- a. Power-on Stall. With nothing above the glareshield to stimulate vision, a natural tendency is to look solely at cockpit instruments. To avoid airsickness, students should momentarily look outside with eyes only to verify attitude while slowing through 100 knots.
 - b. G-Awareness Maneuver. The sensitivity of the instruments during high performance maneuvers can cause students to chase the proper attitude. The resulting erratic up and down nose movements above and below the horizon not only causes poor performance but airsickness, as well. Find a point on the aircraft (the point where the upper exhaust stack meets the airframe) to drag across the horizon.
 - c. ELP series Stalls. Initial recovery will have the nose of the aircraft searching for a stable attitude. Until the aircraft entirely stabilizes, aviators should use the prop arc on the horizon as a visual reference. Only after the prop arc is stable on the horizon should the 8-10 degrees nose down be verified on the attitude indicator.
 - d. Spin. Unlike all the other maneuvers, keep an inside scan as much as possible while conducting spin training. Looking outside too quickly during spin recovery will induce airsickness—wait about two seconds to look outside. The abnormal, abrupt motion of a spin can render the stomach queasy. If altitude and airspeed permits, avoid excessive G-loading during recovery pull-out.
 - e. Unusual Attitudes. Negative G-loading unsettles the stomach. Proper FTI procedures for nose high recovery are to maintain positive G's on the aircraft, which is particularly important to avoid airsickness.
 - f. Landing Pattern. Coupled with additional turbulence, the dynamic nature of the landing pattern causes a lot of head and aircraft movements that incite airsickness. Airsickness recovery is difficult because flying wings level is not possible. For instance, when the aircraft is #1 upwind it has to turn and at the abeam position it

must also turn. If time and fuel permit, depart the pattern to recover and reenter when airsickness subsides.

- (2) When airsickness is recognized, aviators should be proactive and not reactive with trying to correct the problem; don't just endure it.
- (3) Cockpit management and maintaining controls of the aircraft as much as possible are imperative to avoiding airsickness. Storing gear in the right pocket causes students to fly with the left hand, with which they are not proficient. Placing the barf bag in the storage compartment will necessitate head movement and an inside scan when an outside scan is needed the most. Put the barf bag in the left G-suit pocket or under the knee board. When the IP demonstrates a maneuver, lightly ride the controls so as to not be surprised by unanticipated aircraft movements.
- (4) If you start to experience airsickness, inform your instructor the degree of airsickness using the airsickness scale (1 feeling normal, 10 vomiting). When experiencing airsickness aviators should tell instructors their levels after each ops-check or checklist.
- (5) Reduce airspeed and fly aircraft wings level. Slowing down saves fuel, reduce turbulence, and permit more straight and level flight needed to recover. Resuming maneuvers too quickly increases the chance of a relapse.
- (6) Diaphragmatic Breathing. Perform deep diaphragmatic breathing when airsickness symptoms begin. Close your mouth and inhale slowly through your nose so that your abdomen expands. This helps to prevent air swallowing and hyperventilation. Slowly exhale through your mouth. Continue at a slow, comfortable pace. Resume normal breathing once your airsickness symptoms have dissipated.
- (7) Water bottle. Most right-handed people will instinctively use their right hand to hydrate- forcing them to fly rough left-handed flight. Take a sip of iced water to break up the thick spit that develops during airsickness. Water fountain water will warm to a temperature that will provide little relief when it is needed. The water bottle should be small enough to be stored in the left G-suit pocket and have a top that permits one-hand operation, so that normal control can be maintained. The student should also be proficient connecting the left bayonet fitting of the oxygen mask.
- (8) Cool down. While continuing to fly with your right hand, undo the left sleeve and put your hand above the air conditioning vent on the glare shield, so that cool air flows up the sleeve. For added relief pour some water on the back of the neck- this distracts the affected and also cools them down. Caution: an extreme amount of improperly poured water could cause inadvertent LPU activation.

c. Post-Flight Management.

- (1) A visit to the flight surgeon is required after the second episode of airsickness and on any occasion thereafter. Medications, relaxation techniques, adaptation flights, and the Barany chair may be prescribed by the flight surgeon.

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- (2) Call the Aeromedical Safety Officer (AMSO) if you require additional assistance pertaining to airsickness.

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EXAMPLE OF DAILY ROUTINE

Breakfast

- No dairy products
- Bagel with peanut butter only or including honey/grape or apple jelly
- One Ginger tablet (250mg)
- Drink water, apple juice, or a sports drink (no orange, lemonade or tomato juices)

Flight Brief: know briefing info thoroughly (helps reduce stress)

- Following brief, eat a peanut butter sandwich
- One Ginger tablet (250mg)
- Drink water or sports beverage...no more than 20 oz.
- While walking to paraloft, eat a peppermint candy

In-flight

- Minimize head movements/lead with eyes - helps reduce dizziness/nausea
- Exercise deep breathing technique if nauseous
- Ride the controls when IP is demonstrating– helps provide better SA

Lunch

- Refrain from eating greasy, spicy or fried foods
- No dairy products

Dinner/Supper

- Avoid greasy, fried, and spicy foods like Italian red sauce for pastas, cheese, pepperoni pizza
- Grilled chicken or fish, salads
- One Ginger tablet (250mg)
- Drink water, tea, or sports beverage
- No dairy products