

EXPERIMENTAL FLIGHT OF
SOYUZ AND APOLLO.
MEDICAL SUPPORT OF THE CREWS

1972

ERRATA SHEET

1. PURPOSES OF THE DOCUMENT

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The purpose of the present document is to describe the principles agreed upon for medical support of the Soyuz and Apollo space crews taking part in the experimental flight.

2. REFERENCE MATERIAL

2.1. The characteristics of the systems monitoring the condition of the astronauts in the Soyuz and Apollo spacecraft.

2.1.1. The condition of the crew members of the Soyuz spacecraft is monitored by:

a) analysis of data of radio conversations, television observation and the reports of the astronauts about their state of being and physiological functions;

b) analysis of physiological data received twice daily, and recorded and transmitted to the radiotelemetric system by the medical monitoring apparatus.

The medical monitoring apparatus provides simultaneous recording of both astronauts' electrocardiograms and an axillary tap, the seismocardiogram characterizing the mechanical function of the heart, and the respiration frequency.

2.1.2. Monitoring the condition of the crew members of the Apollo spacecraft is accomplished in the following manner. [Space left for insertion of such information].

2.2. The characteristics of the system for monitoring and predicting the radiation situation for the Soyuz and Apollo spacecraft.

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2.2.1. Monitoring and prediction of the radiation situation with respect to the Soyuz spacecraft is

*Numbers in the right-hand margin indicate pagination in the foreign text.

accomplished by the Soviet Radiation Safety Service, whose tasks include:

- collection and processing of data on the radiation situation in space and in the spacecraft received from artificial earth satellite controls and from on board dosimetric equipment;

- collection and analysis of data on astrophysical and geophysical phenomena, which precede and accompany chromospheric solar flares, and prediction of the probable levels of exposure of the astronauts in the case of solar flares, which generate dangerous cosmic rays.

The dosimetric monitoring apparatus on board the Soyuz spacecraft is an on board dosimetric device (for measurement of output and integral dose) and individual "passive" dosimeters (for measurement of the distribution of absorbed and equivalent doses of radiation).

The data obtained with the aid of the on board dosimetric device is transmitted by telemetry to the ground. The signal is transmitted to the astronauts' control console, when the base rate exceed 1 rad/hr.

2.2.2. Provision of the radiation safety of the Apollo spacecraft crew is accomplished in the following manner. [Space left for insertion of said provision follows].

2.3. Lists of the substances contained in the sets of medical accessories (the on board medicine chest) of the Soyuz and Apollo spacecraft and a brief description of their characteristics.

2.3.1. The on board medicine chest of the Soyuz spacecraft contains the following:

- (1) Item No.
- (2) Name of substance.
- (3) Dose and medicinal form.
- (4) Purpose. Pharmacological properties. Indications for use and side effects.

- (1) 1.
- (2) Ambratin.
- (3) Tablets of 0.206 each.
- (4) Antiradiation drug. Has a preventive protective effect on acute radiation exposure, raising the resistance of the organism to the effects of ionizing radiation. Three tablets ea. are taken 2X at 1 hr. intervals upon threat of irradiation.

Side effects: nausea, dizziness, feeling of tenseness or weakness.

- (1) 2.
- (2) Vitamin complex.
- (3) Tablets of 0.5 each.
- (4) Non-specific antiradiation drug. Increases the resistance of the organism to the effects of ionizing radiation. The vitamin complex is taken as 1 tab. 2-3X/day.

Side effects: possible dryness and tickling in the throat, and somnolence.

- (1) 3.
- (2) Caffeine.
- (3) Tablets of 0.1 each; tube syringe 10% - 1.0.
- (4) Psychotonic and analeptic drug. Used in functional inhibition of the central nervous system, in insufficiency of the cardiovascular system and in spasms of the blood vessels of the brain (migraine). Increases mental and physical capacity and reduces feelings of fatigue and drowsiness. One tab. ea. is taken 2-3X/day. Increases blood pressure in collapse and shock states. For this purpose it is administered subcutaneously or intramuscularly in a one-time dose of 1 ml.

Side effects: in large doses causes irritability, agitation and insomnia.

- (1) 4.
- (2) Securinine
- (3) Tablets of 0.02 each.
- (4) Stimulant and analytic drug. Similar to strychnine in the nature of its effect, but is less toxic. Stimulates the central nervous system and increases the reflex arousal of the spinal cord. Taken as a tonic in asthenic state and in neurasthenia accompanied by rapid fatigueability with weakening of cardiac activity. In a dose of 1 tab. ea. 2X/day.

Side effects: causes spasms in large doses.

(1) 5.

(2) Phenamine.

(3) Tablets of 0.01 each.

(4) Strong psychostimulant. Has a stimulating effect due to release of catecholamines from the adrenergic nerve endings. Taken in a dose of 1 tab. ea. 1-2X/day to reduce fatigue and to increase work capacity.

Side effects: depending on individual sensitivity, paradoxical reaction-apathy and a decrease in work capacity are possible in 10-15% of cases. Dizziness, chills, nausea, loss of appetite, insomnia, tachycardia, and disturbance of cardiac patency (arrhythmia) are possible with an overdose. Excreted slowly from the organism and accumulation phenomena are possible. May be habit-forming with prolonged use.

(1) 6.

(2) Analgine.

(3) Tablets of 0.5 each.

(4) Antipyretic and analgesic aid. Taken in a dose of one tablet ea. 2-3X/day for pain from various sources (headache, neuralgia, myositis and reticulitis), and for colds.

Side effects: urticaria and rashes are possible in personnel with increased sensitivity to Analgine.

(1) 7.

(2) Aspirin.

(3) Tablets of 0.5 each.

(4) Febrifuge, antipyretic and analgesic. Taken in a dose of 1 tab. ea. 2-4X/day for neuralgia, migraines and pyretic illnesses. It is desirable that the preparation be taken after eating, with a large quantity of water.

Side effects: Nausea, ringing in the ears, increased perspiration, weakness, bronchospasms, angioneurotic edema, and dermatitis. Anemia and ulcerous effects are possible with prolonged use.

(1) 8.

(2) Promedole.

(3) Tablets of 0.025 each, tube syringe 1% - 1.0.

(4) Similar to morphine in effect. Reduces perception of pain impulses by the central nervous system. Intensifies the anesthetic effect of local anesthetics. Suppresses the arousal of the respiratory center. Has a somniferous effect with regard to removal of the pain syndrome. Has a moderate spasmolytic effect on the smooth muscles. Arouses the vagus nerve center and vomiting center considerably less than morphine. Taken in a dose of 1 tab. ea. 2-3X/day. Administered in a dose of 1.0 subcutaneously or intramuscularly.

Side effects: slight nausea, sometimes dizziness, weakness and a feeling of slight inebriation. May be habit-forming with prolonged use.

[Translator's Note: There is no Item No. 9 listed in the foreign text].

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(1) 10.

(2) Trioxazine.

(3) Tablets of 0.3 each.

(4) Tranquilizer. Reduces emotional arousal, intensifies the effect of narcotics and somnifacients, and has a hypothermal effect. Unlike other tranquilizers, it does not cause muscular relaxation. It is taken in a dose of 1 tab. each 2-3X/day for neurotic states, accompanied by phenomena of arousal, increased irritability, tension, fear and insomnia.

Side effects: weakness, asthenia, slight nausea and somnolence may be observed at relatively large doses. A sensation of dryness in the mouth and throat is noted in individual cases.

(1) 11.

(2) Etaperazine.

(3) Tablets of 0.01 each.

(4) Neuroleptic of the phenothiazine series with a broad spectrum of action. Its antipsychotic properties are combined with a strong antiemetic effect. It has a myorelaxation, hypothermic and adrenolytic effect. It potentiates the effects of somnifacients and narcotics. It has a somniferous effect in the case of persistent insomnia, with neuroses, accompanied by fear, tension, etc. It is taken in a dose of 1 tab. ea. 2-3X/day in neuroses, psychopathy, insomnia, as well as in vomiting, nausea and hiccups.

Side effects: reduction of arterial pressure, weakness, dizziness, somnolence and sluggishness.

(1) 12.

(2) Codeine, with soda.

(3) A tablet contains: codeine--0.015, soda--0.25.

(4) Cough suppressant. It is similar to morphine in its action, but its analgesic properties are more weakly expressed. The ability to suppress the cough center is strongly expressed. Acts as a sedative in combination with somnifacients. It is taken in a dose of 1 tab. ea. 1-3X/day for coughs of different origin.

Side effects: it may inhibit the activity of the gastrointestinal tract and may cause constipation. Cases have been described of its being habit-forming.

(1) 13.

(2) Dimedrol.

(3) Tablets of 0.05 each.

(4) Antihistamine. It is taken in a dose of 1 tab. ea. 2-3X/day for urticaria, bronchial asthma, vasomotor rhinitis, pruritic dermatoses and motion sickness. It has a somniferous effect and intensifies the effect of somnifacients.

Side effects: somnolence, general weakness, dryness in the throat and nausea. Somnolence may be eliminated by taking caffeine.

(1) 14.

(2) Oletetrine.

(3) Tablets of 125,000 units each.

(4) Combination antibiotic with a broad spectrum of action. It is taken in a dose of 1 tab. ea. 4-5X/day for various types of inflammatory diseases (pneumonia, anginas, furuncles, etc.). The course of treatment is not less than 5 days.

Side effects: Dyspeptic phenomena.

(1) 15.

(2) Madribon.

(3) Tablets of 0.5 each.

(4) Fulfanilamide preparation of prolonged effect. It is taken in a dose of 1 tab. ea. 2X/1st 24 hrs. and then 1 tab. ea. 1X/day on subsequent days for various types of inflammatory diseases (pneumonia, anginas, furuncles, etc.) as well as for dysfunction of the gastrointestinal tract. The course of treatment is not less than 5 days.

Side effects: headache, dyspeptic phenomena and skin eruptions.

(1) 16.

(2) Levomycetin.

(3) Tablets of 0.25 each.

(4) Antibiotic with a broad spectrum of action. It is taken in a dose of 1 tab. ea. 4X/day for various types of inflammatory diseases and abscess processes. The course of treatment is not less than 5 days.

Side effects: dyspeptic phenomena, irritation of the mucous membranes of the mouth cavity, and dermatitis.

(1) 17.

(2) Validol.

(3) Tablets of 0.06 each.

(4) Sedative and vasodilative. It is taken for stenocardia, neuroses and isteria. It may be used as an antivomiting substance in cases of motion sickness. The tablets should be held under the tongue until total resorption.