

# SKYLAB MEDICAL EXPERIMENTS ALTITUDE TEST

## DETAILED TEST OBJECTIVE

### I. EXPERIMENT

M073 - Bio-assay of Body Fluids

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### II. PURPOSE AND BACKGROUND

The purpose of this experiment is to assess the effect of simulated Skylab conditions upon endocrine function and the status of fluid and electrolyte control.

Changes in endocrine function have been observed following actual space flight and under such ground-based test conditions as prolonged bed rest, undersea habitation, and prolonged confinement. These changes will be investigated during the three missions of the Skylab Program. In order to adequately assess the effect of weightlessness itself upon the changes which are expected, it is necessary to simulate under ground-based conditions all other environmental conditions which could have effect upon the parameters of interest.



### III. PARTICIPANTS

The three prime crewmembers are required throughout the experimental period commencing 21 days prior to chamber entry throughout chamber occupation and lasting for 18 days after chamber exit. In addition to these three prime crewmembers, three additional control subjects are required.

Each crewmember is required to perform this experiment in order to provide adequate statistical data on the changes which are anticipated. An additional control group is required to determine effect of chamber conditions on subjects as well as verify sample preparations.

### IV. FUNCTIONAL OBJECTIVES

Collect, identify, measure and process a homogenous urine sample of at least 75 ml every 24 hours for each crewman throughout the mission.

Collect, identify, stabilize 25 ml of blood three times pre-, four times in chamber, three times post.

### V. TEST CONDITIONS

All urine will be collected, volume measured within  $\pm 2\%$ , identified (crewman, volume and time), processed, and a sample stored and returned.



Voids should be accumulated in 24 hour cycles for each crewman. Except for unusual circumstances, the 24 hour time period will be regularized by making the close-out time within  $\pm 30$  minutes of the same hour each day.

Blood will be separated to serum and plasma as soon as drawn. Then frozen for future analysis.

Each urinary void must be preserved such that bacterial growth is inhibited and that there will be no significant degradation of the constituents of interest. The preservation procedure shall consist of cooling the pooled voids for each crewman at  $50^{\circ} \pm 9^{\circ}\text{F}$  within 3 hours of collection. For each 24 hour sample, a 122 ml sample shall be processed.

Each 122 ml sample shall then be identified as to crewman, volume and time, and frozen at  $-2.4^{\circ}\text{F}$  within 3 hours of the last void collection. A temperature below  $-2.4^{\circ}\text{F}$  will be maintained until the sample is transferred outside the test vehicle.

## VI. HARDWARE REQUIREMENTS

No hardware is required by this experiment except for blood and urine collection equipment used by M110 and M071.



## VII. CHAMBER INTERFACE

### Urine Collection and Preservation System

## VIII. CREW TRAINING

Two briefings of approximately 1 hour each are required within the month immediately prior to the commencement of the preflight control period.

## IX. SCHEDULING REQUIREMENTS

This experiment will be performed every day throughout the applicable test. Body mass measurements will be taken following the first void of the day. Twenty-four hour urine pools will be closed after the first void of the day.

## X. DATA REQUIREMENTS

This experiment has no unique measurements other than the collection and measurement of urine and blood samples.

Data from all other Skylab experiments is required - in particular, data from M071 Mineral Balance, M074 Specimen Mass Measurement, M092 Inflight LBNP, M111 Cytogenetic Studies of Blood, M112 Man's Immunity-In Vitro Aspects, M113 Blood Volume and Red Cell Life Span, M114 Red Blood Cell Metabolism, M115 Special Hematologic Effects, M131 Human Vestibular Function, M151 Time and Motion Study, M171 Metabolic Activity, M172 Body Mass Measurements.



5  
XI. FDF REQUIREMENTS

XII. DEVIATIONS FROM APPROVED SKYLAB EXPERIMENTS

This experiment is identical to that which will be deployed on Skylab with the exception that the waste management equipment and body mass measurement equipment will not be flight type and blood samples will be required during the period of chamber testing.