

XVI. Examiner's Handbook

A. General Instructions

Project RANCH HAND II is a multiyear effort to determine whether or not C-123 aircrew members who were engaged in the aerial spraying of herbicides in Vietnam have developed significant adverse health effects from that exposure. Detailed surveys of the world's literature have been used in designing the history questionnaires, physical examination protocol, and laboratory procedures.

This phase of Project RANCH HAND II involves a cross sectional study of the subject's health at the time of examination. It is important that examiners remain unaware of the subject's status as a RANCH HAND participant or as a control subject. The physician examiner is tasked to examine and objectively record his findings. The examining physician is not, and cannot be expected to arrive at any definitive diagnosis as the full history and laboratory results will not be available to him. Medical history, laboratory results and physical examination findings will be evaluated by an independent diagnostician employed by the contractor. This diagnostician will formulate diagnoses and differential diagnoses, if appropriate. Additional procedures to treat or evaluate emergency or urgent medical conditions will be directed only by this physician. In addition, he will present a detailed analysis and debriefing to the study subject and provide a copy of the analysis to the subject's personal physician, if so requested.

The physicians performing examinations for Project RANCH HAND II should be aware that the report of examination will become a permanent record. This report will be referred to not only in the near future as the cross sectional study is analyzed, but also at the time of the next review of the subject in the follow-up phases of Project RANCH HAND. These examinations will define the health status of the subjects at a point in time, and will establish the presence or absence of abnormal physical findings. After statistical review of the study groups, these findings may permit definition of a chronic effect due to exposure. An inaccurate examination may lead to fallacious study results in two ways: a presumed syndrome may be defined which does not in fact exist, or a syndrome which in fact exists may not be defined with enough validity to warrant further actions.

The examining physician is responsible for recording a complete and detailed report of the physical examination. In this role, the examining physician is tasked with collecting evidence of the presence or absence of physical signs of abnormality only. The formulation of diagnostic impressions by individual examiners is not requested nor desired. All items on the physical examination report form must be completed. It is imperative that the physician make such additional remarks as may be required to adequately describe existing physical and mental impairments. Since clinical endpoints have not been well defined following chronic exposure to Herbicide Orange, the examining physician and the diagnostician must not definitively ascribe abnormalities to herbicide exposure during the course of the examination or during the patient's debriefing. If, during the examination, the physician

discovers evidence of acute serious illness requiring immediate treatment, the normal emergency or urgent care procedures of the medical facility would apply. Such care will be supplied at Air Force expense. If during the examination, there is evidence of illness requiring non-emergency medical attention, the diagnostician should inform the subject and offer to forward or have forwarded pertinent information to the subject's physician. A clear record of any such advice and treatment should be recorded. The ultimate value of the RANCH HAND II Study will lie in the collection of complete, accurate and, whenever possible, quantitative data permitting the most stringent and powerful statistical analysis. For that reason, the physical examination protocol requires exact measurements in many instances, and the use of defined meanings of semiquantitative indicators in other places.

B. Conduct of the Examination

(1) Upon arrival at the examining facility, the subject should be briefed by the on-site monitor on the appointments which have been arranged, their times, and locations.

(2) Collation and forwarding of examination results

The monitor will complete a checklist for each study subject and review all medical information for quality and completeness before forwarding to USAFSAM/EK, Brooks AFB, TX 78235.

C. Examination Format

SECTION	PHYSICAL EXAMINATION	SUBJECT NUMBER
1. GENERAL APPEARANCE		
a. Appearance/Stated Age <input type="checkbox"/> Younger Than <input type="checkbox"/> Older Than <input type="checkbox"/> Same As		
b. <input type="checkbox"/> Well-nourished <input type="checkbox"/> Obese <input type="checkbox"/> Under-nourished		
c. Appearance of illness or distress <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Older Than		
d. Hair Distribution <input type="checkbox"/> Normal <input type="checkbox"/> Abnormal		
e. Temperature _____ SPECIFY: _____		
2. HEIGHT cm	WEIGHT (Undressed) kg	SITTING BLOOD PRESSURE RIGHT ARM AT HEART LEVEL
		SYSTOLIC _____ DIASTOLIC _____
3. PULSE RATE _____ REGULAR: <input type="checkbox"/> YES <input type="checkbox"/> NO Describe any irregularities.		
a. Irregular <input type="checkbox"/>		
b. Irregularly irregular <input type="checkbox"/>		
c. VPBs per minute _____		
4. EYE GROUND <input type="checkbox"/> NORMAL <input type="checkbox"/> ABNORMAL Describe any vascular lesions, hemorrhages, exudates.		
<input type="checkbox"/> A-V nicking <input type="checkbox"/> Hemorrhages papilledema		
<input type="checkbox"/> ↑ light reflex <input type="checkbox"/> Exudates <input type="checkbox"/> Papilledema		
<input type="checkbox"/> Arteriolar spasm <input type="checkbox"/> Disk Pallor <input type="checkbox"/> ↑ Cupping		
5. ARCUS SENILIS <input type="checkbox"/> PRESENT <input type="checkbox"/> ABSENT 5a. Abnormal Ocular Pigmentation <input type="checkbox"/> Yes <input type="checkbox"/> No		
6. ENT <input type="checkbox"/> NORMAL <input type="checkbox"/> ABNORMAL Describe any abnormality.		
Tympanic membranes intact <input type="checkbox"/> Yes <input type="checkbox"/> No R <input type="checkbox"/> L <input type="checkbox"/>		
Nasal ulcerations <input type="checkbox"/> No <input type="checkbox"/> Yes		
7. NECK (Especially thyroid gland) <input type="checkbox"/> NORMAL <input type="checkbox"/> ABNORMAL Describe any abnormality.		
Thyroid gland palpable <input type="checkbox"/> Enlarged <input type="checkbox"/> Parotid gland enlargement <input type="checkbox"/> R <input type="checkbox"/> L		
Nodules <input type="checkbox"/> Tenderness <input type="checkbox"/> Carotid pulses _____		
8. THORAX AND LUNGS <input type="checkbox"/> NORMAL <input type="checkbox"/> ABNORMAL Describe any abnormality, especially basilar rales.		
<input type="checkbox"/> Asymmetrical expansion <input type="checkbox"/> Wheezes Circumference at nipple level		
<input type="checkbox"/> Hyperresonance <input type="checkbox"/> Rales Expiration _____ cm		
<input type="checkbox"/> Dullness Inspiration _____ cm		
9. HEART <input type="checkbox"/> NORMAL <input type="checkbox"/> ABNORMAL Describe any enlargement, irregularity of rate, murmurs, or thrills.		
Displacement of apical impulse <input type="checkbox"/> No <input type="checkbox"/> Yes Precordial thrust <input type="checkbox"/> No <input type="checkbox"/> Yes		
Heart sounds normal <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> S1 <input type="checkbox"/> S2 <input type="checkbox"/> S3 <input type="checkbox"/> S4		
(Continued in Item 18 on Reverse)		
10. ABDOMEN <input type="checkbox"/> NORMAL <input type="checkbox"/> ABNORMAL Describe any abnormality with special attention to the spleen and liver. Record waist measurement on attached form.		
<input type="checkbox"/> Hepatomegaly <input type="checkbox"/> Other mass _____		
_____ cm Liver Span Specify: _____		
<input type="checkbox"/> Splenomegaly <input type="checkbox"/> Tenderness _____		
<input type="checkbox"/> Liver <input type="checkbox"/> Spleen <input type="checkbox"/> Other, specify: _____		
11. EXTREMITIES <input type="checkbox"/> NORMAL <input type="checkbox"/> ABNORMAL Describe any edema or signs of vascular insufficiency.		
<input type="checkbox"/> Absence, specify: _____		
<input type="checkbox"/> Edema <input type="checkbox"/> Clubbing of nails		
<input type="checkbox"/> Pitting <input type="checkbox"/> Non-pitting <input type="checkbox"/> Varicosities		
<input type="checkbox"/> Loss of hair on toes		
<input type="checkbox"/> R <input type="checkbox"/> L		

SECTION		PHYSICAL EXAMINATION (Continued)			
12. PERIPHERAL PULSES		NORMAL	DIMIN.	ABSENT	COMMENTS
RADIAL					
FEMORAL					
POPLITEAL					
DORSALIS PEDIS					
POSTERIOR TIBIAL					
13. SKIN		<input type="checkbox"/> NORMAL	<input type="checkbox"/> ABNORMAL		
<input type="checkbox"/> Dermatographia <input type="checkbox"/> Comedones <input type="checkbox"/> Acneiform lesions <input type="checkbox"/> Acneiform scars <input type="checkbox"/> Depigmentation <input type="checkbox"/> Inclusion cysts <input type="checkbox"/> Cutis Rhomboidalis		Indicate type and location of lesions on the attached anatomical figure <input type="checkbox"/> Hyperpigmentation <input type="checkbox"/> Jaundice <input type="checkbox"/> Spider angiomata <input type="checkbox"/> Palmar erythema Full-Face and Bilateral profile photos taken <input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Palmar Keratosis <input type="checkbox"/> Patechiae <input type="checkbox"/> Ecchymoses <input type="checkbox"/> Soles of feet <input type="checkbox"/> Nails Biopsy Taken <input type="checkbox"/> Yes <input type="checkbox"/> No			
14. MUSCULOSKELETAL		<input type="checkbox"/> NORMAL	<input type="checkbox"/> ABNORMAL		
<input type="checkbox"/> Muscle - Specify: <input type="checkbox"/> Weakness <input type="checkbox"/> Tenderness <input type="checkbox"/> Abnormal Consistency <input type="checkbox"/> Atrophy		<input type="checkbox"/> Spine <input type="checkbox"/> Scoliosis <input type="checkbox"/> Kyphosis <input type="checkbox"/> Tenderness, Level _____ <input type="checkbox"/> Decreased range of motion <input type="checkbox"/> Pelvic tilt <input type="checkbox"/> Straight Leg Raising: Right/Left			
15. GENITOURINARY - RECTAL - HERNIA		<input type="checkbox"/> NORMAL	<input type="checkbox"/> ABNORMAL		
<input type="checkbox"/> Inguinal hernia <input type="checkbox"/> R <input type="checkbox"/> L <input type="checkbox"/> Testes <input type="checkbox"/> Absent <input type="checkbox"/> Enlarged <input type="checkbox"/> Atrophic		<input type="checkbox"/> Varicocele <input type="checkbox"/> Epididymis <input type="checkbox"/> Scrotal Mass _____ cm dia <input type="checkbox"/> Hemorrhoids <input type="checkbox"/> Prostatic Enlargement <input type="checkbox"/> Rectal mass			
16. LYMPH NODES - CHECK ALL AREAS.		<input type="checkbox"/> NORMAL	<input type="checkbox"/> ABNORMAL - SPECIFY CERVICAL, OCCIPITAL, SUPRACLAVICULAR, AXILLARY, EPITRACHELEAR, INGUINAL, FEMORAL		
<input type="checkbox"/> Enlarged _____ <input type="checkbox"/> Tender _____ <input type="checkbox"/> Hard _____ <input type="checkbox"/> Fixed _____ <input type="checkbox"/> Confluent _____					
17. NERVOUS SYSTEM - SEE ATTACHED FORMS					
18. HEART AND OTHER OBSERVATIONS (Continued from Item 9)					
Murmur <input type="checkbox"/> No <input type="checkbox"/> Yes Area <input type="checkbox"/> Ao <input type="checkbox"/> Pu <input type="checkbox"/> Apex					
Sys <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
Dia <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
DATE OF EXAMINATION			TYPED OR PRINTED NAME OF EXAMINING PHYSICIAN		
MONTH	DAY	YEAR			
EXAMINING FACILITY			SIGNATURE		

CLINICAL RECORD

NEUROLOGICAL EXAMINATION

HEAD AND NECK - Normal to Palpations/Inspection Y N Specify Scar

Asymmetry Depression

Carotid Bruit No R L

Neck Range of Motion Normal or Decreased to Left Right

Forward Backward

TRUNK

MOTOR SYSTEM - Handedness Right Left

Gait Normal or Broad Based Ataxic Small Stepped Other-Specify

Associated Movements Arm Swing Normal or Abnormal R L

Muscle Status (strength, tone, volume, tenderness, fibrillations)

Bulk Normal Abnormal

Tone Upper Extremities Normal or Increased Decreased

Right Left

Lower Extremities Normal or Increased Decreased

Right Left

Strength - Distal wrist extensors Normal Decreased

Ankle/Toe Dors/Flexors Normal Decreased R L

Proximal Deltoids Normal Decreased R L

Hip Flexors Normal Decreased R L

Abnormal Movements (tremors, tics, choreas, etc.) Fasciculations No Yes (1-4+)

Tenderness No Yes (1-4+)

Tremor No Yes - Specify

Upper Extremity R L Resting Essential Intention

Lower Extremity R L Other

Coordination (a) Equilibratory - Eyes Open

Eyes Closed - Romberg Positive (Abnormal) Negative (Normal)

Right Foot

Left Foot

(b) Nonequibratory (F to N; F to F; H to K) Finger-to-nose-to-finger
 Normal Abnormal Right Left Both

Heel-Knee-Shin Normal Abnormal Right Left Both

(c) Succession Movements (including check, rebound, posture-holding)

If indicated, check Normal Abnormal R L

Rapidly alternative movements Normal Abnormal R L Both

Skilled Acts

(a) Handwriting. If indicated, Normal Abnormal

(b) Speech (articulation, aphasia, agnosia) Grossly Normal

Abnormal - Specify Dysarthria

Aphasia

Reflexes (0-absent; 1-sluggish; 2-active; 3-very active; 4-transient clonus; 5-sustained clonus)

Deep	R		L		Deep	R		L		Other	R		L		Abnormal	R		L		
Biceps					Patellar					Cremasteric										
Triceps					Achilles															
Remarks																				

MENINGEAL IRRITATION

R L Both

Straight Leg Raising Normal Abnormal R L Both

NERVE STATUS (tenderness, tumors, etc.)

SENSORY SYSTEM (tactile, pain, vibration, position. If positive sensory signs are present, summarize below and indicate details on Anatomical Figure, Std. Form 531)

Light Touch Normal Abnormal

Pin Prick Normal Abnormal (Map on Anatomical Figure)

Vibration (at ankle, 128 hz tuning fork): Normal Abnormal R L Both

Position (Great toe): Normal Abnormal R L Both

CRANIAL NERVES

I R Smell Present Absent

L Smell Present Absent

II Fundus R Normal Abnormal Disk Pallor/atrophy
 Exudate Papilledema Hemorrhage

Fundus L Normal Abnormal Disk pallor/atrophy
 Exudate Papilledema Hemorrhage

Fields (to confrontation)

Right Normal Abnormal Left Normal Abnormal

III Normal Abnormal - Specify

IV Pupils-Size (mm) Equal Unequal Difference mm

VI Shape, position Round Other R L

Light, Reaction Normal Abnormal R L

Position of Eyeballs

Movements R L

Nystagmus Rotary Horizontal Vertical
 (Draw position)

XI

- Ptosis R L
- V Motor R Clench Jaw - Symmetric Deviated R L
- L
- Sensory R Normal Abnormal V₁ V₂ V₃
- L Normal Abnormal V₁ V₂ V₃
- Corneal Reflex R L
- VII Motor R Normal smile Yes No Palpebral Fissure Yes No
- L Normal smile Yes No Palpebral Fissure Yes No
- IX Palate and Uvula
- X Movement Normal Deviation to R L
- Palatal Reflex R Normal Abnormal
- L Normal Abnormal
- XII Tongue-Protruded-Central R L
- Atrophy No Yes
- MENTAL STATUS (alert, clear, cooperative, etc.) Gross abnormalities: No
- Yes - Specify

DIAGNOSTIC SUMMARY
SYNOPSIS OF POSITIVE FINDINGS

Medical History:

Physical Examination:

General

Dermatologic

Neurological

Psychological

Laboratory Results:

Diagnosis:

Differential Diagnosis, if applicable:

Date

Signature
of Diagnostician

D. Special Procedures

(1) Nerve Conduction Velocities

(a) These studies have been determined to be an important parameter in long-term follow-up studies of persons thought to have been exposed to Herbicide Orange components.

(b) The Nerve Conduction Velocities should be performed by a physician or by a specialty qualified technician under the supervision of a physician trained in neurophysiological methods.

(c) Specific NCVs (See form included in F. Below)

(1) Ulnar Nerve (one side only)

(a) motor (above elbow, below elbow)

(b) values recorded

(i) distal latency

(ii) NCV

(2) Peroneal Nerve (one side only)

(a) motor

(b) values recorded

(i) distal latency

(ii) NCV.

(3) Sural Nerve (one side only)

(a) sensory: orthodromic

(b) values recorded: NCV

(d) Methods

PERONEAL NERVE

(1) Active electrode is placed over the extensor digitorum brevis and reference over the little toe. Stimulating electrodes are placed over anterior distal leg 8 cm proximal to active electrode. Proximal site is distal to head of fibula. If entrapment is suspected at fibular head use a stimulation site of 12-18 cm more proximal to the fibular head.

Anomalous innervation to the extensor digitorum brevis occurs in 1/5 patients (at least partially). Identified by inability to evoke a muscle action potential when stimulating at anterior ankle or a different shape (smaller) potential when stimulating here. This accessory nerve causes posterior to lateral malleolus so cathode should be placed here.

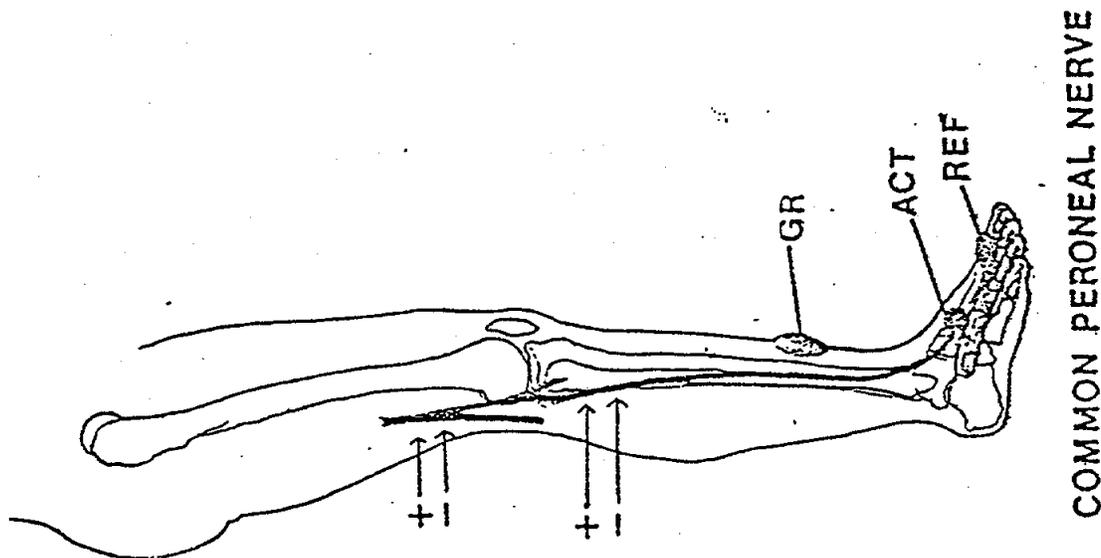
NORMAL VALUES

49.9 ± 5.9 M/sec
Distal latency: 4.5 ± .8 ms

Proximal latencies have been determined for use in below the knee amputees, and neuromuscular diseases where extensor digitorum brevis action potential cannot be elicited. Active electrode is placed 1/2 way down leg over middle of dorsiflexor muscle group and stimulation at fibular head.

NORMAL VALUES

5.5 - 7.2 ms (N = 217)

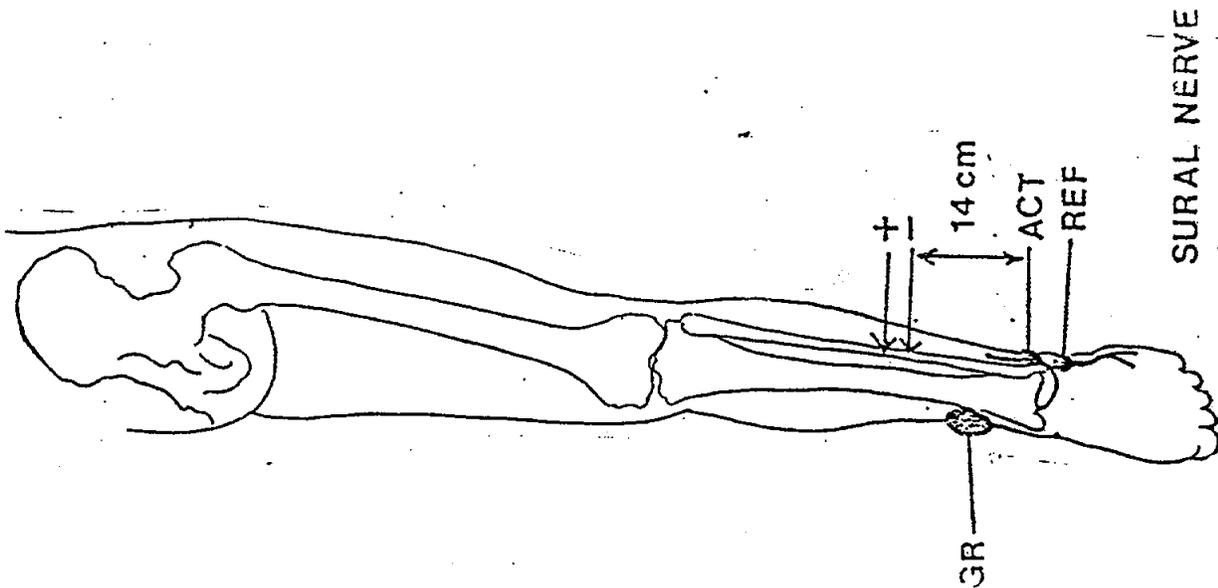


SURAL NERVE

(2) Active and recording electrodes are placed under lateral malleolus on lateral aspect of ankle. Sural nerve is stimulated as it pierces the gastrocnemius fascia just lateral to the midline of posterior distal calf, 10-18 cm proximal to active electrode. If leg is cold - a clue is prolonged latency of peroneal nerve - determine temperature. Subtract .1 ms (latency of activation) from the observed latency and divide into the distance.

NORMAL VALUES (after LaFratta)

<u>Age</u>	<u>(To Peak)</u>
20-29	44 ± 2.5 M/sec
30-39	38.80 ± 3.3 M/sec
40-49	36.70 ± 3.7 M/sec
50-59	37.20 ± 3.0 M/sec
60 & over	35.00 ± 3.8 M/sec



ULNAR NERVE

MOTOR CONDUCTION

- (3) Active electrode is placed over center of abductor digiti quinti; reference over proximal phalanx fifth digit. Stimulation (cathode) just radial to tendon of flexor carpi ulnaris 8 cm proximal to active electrode. Proximal site of stimulation should be just below ulnar groove and 18 cm proximal to ulnar groove on medial aspect of humerus.

N.B.: Elbow should be flexed to 70 degrees during procedure of stimulation and measurement to make more precise the actual length of ulnar nerve. More proximal stimulation sites include supraclavicular and C-8 root (see median nerve).

SENSORY CONDUCTION

Antidromic - ring electrodes over fifth digit separated by 4 cm. N.B. motor artifact may be interfering. Stimulate 14 cm proximal to active electrode at same site as motor stimulation.

Orthodromic - reverse stimulation and recording electrodes. More proximal sites of stimulation may also be done.

NORMAL VALUES

- 57 ± 4.7 M/sec - motor forearm segment
- 62.7 ± 5.5 M/sec - motor across elbow segment
- 56.7 ± 4.2 M/sec - sensory orthodromic (to peak)
- 54.9 ± 3.9 M/sec - sensory antidromic (to peak)

Distal Latency:

Motor: 3.7 ± .3

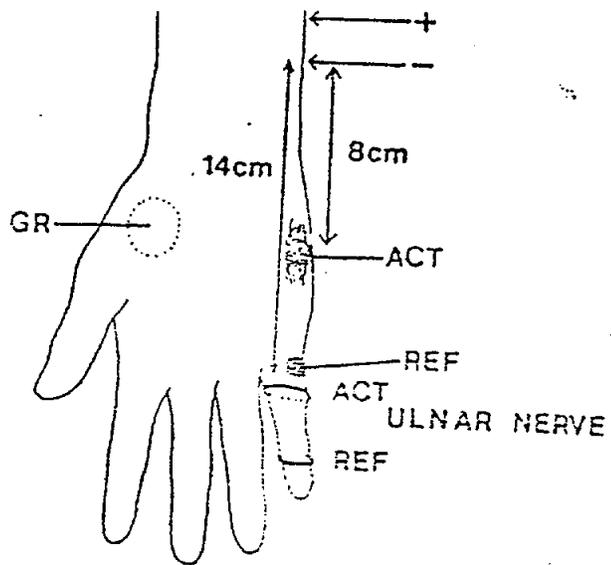
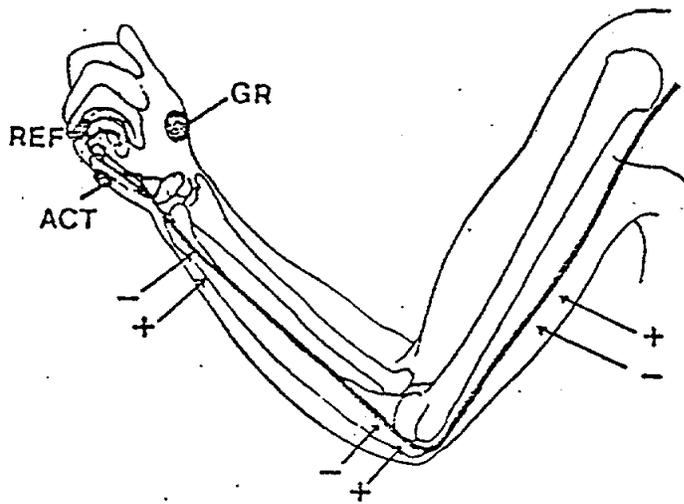
Sensory: 3.0 ± .25 Antidromic (peak)
3.0 ± .25 Orthodromic (peak)

Muscle AP 8-20 mV

Sensory AP 15-50 mV

ADDENDUM

For deep branch surface recording electrode should be over adductor pollicis (i.e. just medial to thenar eminence on palmar surface of web space). Additional latency is .5 ms.



(e) Disposition

Forward the recorded results on the form attached to the examination package to the diagnostician.

(2) Psychological Battery

(a) General

(1) This battery yields objective numerical data, and is well-standardized and clinically validated. The individual tests were chosen to insure an adequate analysis of one of the major alleged manifestations of herbicide toxicity. Each test either validates one of the other tests, or is considered to be a "definitive" test for analysis of a suspected psycho/neuropathic effect.

(2) Compared to the general civilian population, characteristic response tendencies are observed on the MMPI and Cornell Index among active duty aircrewmembers being evaluated in an aeromedical setting. It is also important to consider the effect that pending retirement has exerted on the reporting of medical history and symptomatology. This may also alter responses to psychological testing.

(3) The battery requires approximately 5-1/2 to 6-3/4 hours to administer, depending on the speed of the examinee. An additional 1 to 2 hours of scoring and other clerical tasks will be required. Since test debriefing to clarify unusual performances, response biases, etc., is a crucial part of the psychologic evaluation, it is recommended that testing begin and be completed as early as possible during each examinee's stay at his respective evaluative facility.

(b) Specific Tests

(1) Wechsler Adult Intelligence Scale (WAIS): 60-75 minute individually-administered collection of verbal and nonverbal intellectual measures; also useful for clinical inferences when combined with the neuropsychological battery below.

(2) Reading subtest of the Wide Range Achievement Test (WRAT): 10-minute individually-administered measure of word recognition ability. Important to rule-out reading inefficiency should response to personality instruments below be of questionable validity (e.g., high F Scale on MMPI).

(3) Halstead-Reitan Neuropsychological Test Battery: 150-180 minute individually-administered collection of brain behavior relationship measures for establishing the functional integrity of the cerebral hemispheres. The battery must include the following subtests: Category, Tactual performance, Speech-Sounds, Seashore Rhythm, Finger Tapping, Trail

Making, and Grip Strengths. The Aphasia Screening and Sensory-Perceptual Exams are considered optional in view of their redundancy with the clinical neurologic exam included in this project. Individualized test debriefing is conducted to clarify test performances in the WAIS and Neuropsychological Battery.

(4) Three subtests of the Wechsler Memory Scale I (WMS I): 30-minute individually-administered measures of immediate and delayed recall of verbal and visual materials. The Logical Memory, Associate Learning and Visual Reproduction subtests are to be administered in the standard, immediate-recall fashion initially. After 30 minutes has elapsed, the examinee is asked, without prior alerting, to recall as much as he can about the Logical Memory and Visual Reproduction subtest stimuli. Standard scoring is used for both test-retest administrations.

(5) Cornell Index (CI): 10-15 minute selfadministered and standardized neuropsychiatric symptom and complaint inventory, including items involving asthenia, depression, anxiety, fatigue, and GI symptoms in lay language. Endorsement of items are to be explored and clarified in test-debriefing.

(6) Minnesota Multiphasic Personality Inventory (MMPI): 60 to 90 minute self administered clinical psychiatric screening instrument; also capable of estimating response biases (e.g., "fake good," or "fake bad"). The shortened version of Form R (i.e., items 1 to 399) may be substituted for the 566-item Long Form. Standard scoring and Minnesota norms are to be used, with the possible exception of active duty examinees where USAFSAM aircrew norms may be applied. Clarification of profiles showing response biases, questionable validity, and/or unusual item endorsements will be conducted in individual test debriefing.

(c) Examination Results

Forward all test materials as scored with annotations, interpretations, and impressions to the diagnostician for inclusion in the subject's examination file.

(d) Psychometrics: Special Instructions

(1) For the Cornell Index and MMPI, each subject is instructed: (a) to answer carefully every item; and (b) that wherever applicable, his responses should reflect personal experiences, beliefs, preferences, etc., only for the time period between his combat tour in SEA and the date of testing. These instruments are not to be group administered and a reasonable amount of privacy should be provided. These instruments should not be completed at the subject's overnight quarters nor anywhere else outside the supervised confines of the evaluative facility.

(2) If a subject's measured word recognition falls below the 6.5 Grade Level (Raw Score=40, Level II) according to the WRAT Reading subtest, the Cornell Index and MMPI are read aloud or administered via tape recording. In such cases, the subject retains the right to mark his answer sheet outside the view of the examiner or of others within hearing distance.

(3) All eleven subtests of the WAIS are administered, i.e., pro-rating of subtests is not allowed. The scoring of WAIS subtest items, and the operations of summing, transferring, and finding Raw Scores, Scaled Scores, and Tabled IQ values are double-checked for accuracy by the Psychologist in charge (or his/her appointed representative) before the raw data are forwarded to the diagnostician.

(4) Precautions similar to those in #3 above are exercised in the scoring and other clerical tasks associated with the Halstead-Reitan, WMS I, WRAT, Cornell, and MMPI.

(5) For the Halstead-Reitan, use as the preferred, or dominant, hand the one which the subject uses most in writing. If in doubt, administer a "Name Writing Test", where the subject is simply asked to write his name in a normal manner as though signing a personal check. The examiner measures the time for each hand to perform, (without alerting the subject to the timing), and assigns dominance to the quickest hand.

(6) For the grip strength measure, report the average, in kilograms, of 3 brief, but maximum, squeezes of the dynamometer for the preferred and the non-preferred hands. Alternate hands between trials.

(7) The Psychologist in charge will conduct a one-to-one test debriefing with each subject to estimate the test-by-test and overall accuracy and validity of the test results. A prepared form is provided for this purpose, and should be filled out completely before forwarding, with the subject's raw data, to the diagnostician. If applicable, input from the testing technician utilized is encouraged.

(3) Electrocardiogram

(a) A standard 12-lead scalar electrogram is required. If an arrhythmia is observed, a one minute rhythm strip is requested, in addition. The electrogram will be done following a minimum fast of four hours.

(b) Mounting: Mount the tracing in the usual manner of the laboratory for the recorder used.

(c) Disposition: Forward the mounted tracing and rhythm strip, if obtained, to the diagnostician.

(d) Interpretation:

The electrocardiograms will be interpreted by cardiologists at the examination center, and forwarded to USAFSAM/NG where physicians in the USAF Central ECG Library will compare the tracing to previous individual ECG records in the case of rated (pilot or navigator) subjects.

(e) Disposition (USAF Central ECG Library):

(1) Pilots and Navigators - The original tracings will be microfished and added to the individual's permanent record.

(2) Enlisted Subjects - The original tracings will be microfished and a permanent record established for each individual.

(4) Radiographic Examination

(a) Examination

A standard 14x17 in., standing, roentgenogram in the PA position using small nipple markers will be accomplished.

(b) Interpretation

A board-certified radiologist at the examination center will interpret the roentgenogram and record the results and forward them to the diagnostician.

(5) Pulmonary Function Studies

Standard evaluation of vital capacity and forced expiratory volume at 1 second will be performed.

(6) Laboratory Procedures

(a) General Instructions; First Day

(1) The patient should report in the morning in a fasting state having had water only after midnight. The patient will have been requested to eat approximately 150 gms of carbohydrate each of the three preceding days and to consume no alcoholic beverages. Non-compliance is not a contraindication to drawing the blood specimens. However, a notation of extent of noncompliance should be made by the examining physician to aid in the interpretation of the results.

(b) General Instructions; Second Day

Serum hormone levels should be determined from specimens collected on the morning of the second day. Hormonal levels appear to oscillate rapidly in a random fashion. Distributions drift with time suggesting

diurnal variations and some are affected by nonfasting state. Therefore, patients should be fasting prior to drawing blood for hormone analysis.

(c) Specific Tests to be Performed on all Participants

- (1) Hematocrit
- (2) Hemoglobin
- (3) RBC Indices
- (4) White Blood Cell Count and Differential
- (5) Platelet Count
- (6) Erythrocyte Sedimentation Rate
- (7) Urinalysis
- (8) Semen Analysis (Number, % Abnormal, Volume)
- (9) Blood Urea Nitrogen
- (10) Fasting Plasma Glucose
- (11) Creatinine
- (12) 2-hour Post Prandial Plasma Glucose
- (13) Differential Cortisol (0730 and 0930 hours)
- (14) Cholesterol & HDL
- (15) Triglycerides
- (16) Bilirubin, Total and Direct
- (17) SGOT
- (18) SGPT
- (19) GGTP
- (20) Alkaline Phosphatase
- (21) LDH
- (22) Serum Protein Electrophoresis
- (23) CPK

- (24) VDRL
- (25) LH
- (26) FSH
- (27) Testosterone
- (28) Thyroid Profile (RIA) (T₃, T₄, TSH,FTI)
- (29) Delta-aminolevulinic Acid
- (30) Urine Porphyrins
- (31) Hepatitis B antigen/antibodies (HB_SAg, anti HB_CAg, anti HB_SAg)
- (32) Prothrombin time
- (33) Blood Alcohol

(d) Tests to be performed on selected subjects

- (1) Anti-nuclear Antibody on subjects with evidence of autoimmune disorders
- (2) Hepatitis A Antigens/antibodies for those with current or past liver disease
- (3) Karyotyping for those fathering children with birth defects
- (4) Skin photography and skin biopsy on subjects with suspected chloracne
- (5) For those whose medical history indicates an increase in infectious diseases
 - (a) Immuno-electrophoresis
 - (b) Quantitative Immunoglobulin Determinations
- (6) To be performed on a randomly selected group of study subjects
 - (a) Enumeration of B and T cells
 - (b) Enumeration of Monocytes
 - (c) B and T cell function tests

(e) Rationale for laboratory procedures

(1) Studies on the toxicity of TCDD in animals have shown that the following organ systems are damaged:

(a) Liver: Hepatic necrosis, liver enzyme changes, hypoproteinemia, hypercholesterolemia, hypertriglyceridemia.

(b) Reticuloendothelial System: Thymic atrophy, altered cellular immunity, decreased lymphocyte counts.

(c) Hemopoietic System: Anemia, thrombocytopenia, leukopenia, pancytopenia.

(d) Endocrine System: Hemorrhage and atrophy of adrenal cortex, hypothyroidism.

(e) Renal: Increase in blood urea nitrogen.

(f) In addition, statistically significant increases in hepatocellular carcinomas (liver) and squamocellular carcinomas of the lung were found.

(2) Studies on the toxic effects of TCDD in man have shown that the following organ systems are damaged:

(a) Skin: Chloracne, hirsutism.

(b) Liver: Porphyria cutanea tarda. Increased levels of transaminase and of GGTP. Enlarged, tender liver, hyperlipidemia.

(c) Renal: Hemorrhagic cystitis, focal Pyelonephritis.

(d) Neuromuscular System: Asthenia, i.e., headache, apathy, fatigue, anorexia, weight loss, sleep disturbances, decreased learning ability, decreased memory, dyspepsia, sweating, muscle pain, joint pain and sexual dysfunction.

(e) Endocrine System: Hypothyroidism.

(3) Based upon the reports of toxic effects in animal and human exposures, the following organ panels are recommended:

(a) Hemopoietic

(b) Reticuloendothelial

- (c) Renal
- (d) Endocrine
- (e) Neuromuscular
- (4) Hemopoietic screening should include:
 - (a) Hematocrit
 - (b) Hemoglobin
 - (c) RBC indices
 - (d) Erythrocyte sedimentation rate
 - (e) Platelet count
 - (f) Prothrombin time
- (5) Reticuloendothelial system:
 - (a) White blood cell count
 - (b) Differential
 - (c) Serum protein electrophoresis
 - (d) Selective use of immunoelectrophoresis and quantitative immunoglobulin determination
 - (e) B cell and T cell counts and functions
- (6) Hepatic screen:
 - (a) SGOT
 - (b) SGPT
 - (c) GGTP
 - (d) Bilirubin, Total and Direct
 - (e) Alkaline phosphatase
 - (f) LDH
 - (g) Cholesterol

- (h) HDL
 - (i) Triglyceride
 - (j) Urine porphyrins
 - (k) Urine porphobilinogen
 - (l) Hepatitis B antigens/antibodies (HB_sAg, anti HB_cAg, anti HB_sAg)
- (7) Renal screen:
- (a) Urinalysis
 - (b) BUN
 - (c) Creatinine
- (8) Endocrine screen
- (a) Differential cortisol (0730 and 0930 hours)
 - (b) Thyroid profile (RIA)
 - (c) Fasting plasma glucose
- (9) Neuromuscular system: CPK
- (10) Elucidation of symptoms of asthenia:
- (a) Testosterone
 - (b) LH
 - (c) FSH
- (11) The following tests should be performed only as follow-up for abnormalities in the history or physical examination findings:
- (a) HAVAB (IgG and IgM)
 - (b) ANA

E. Forms

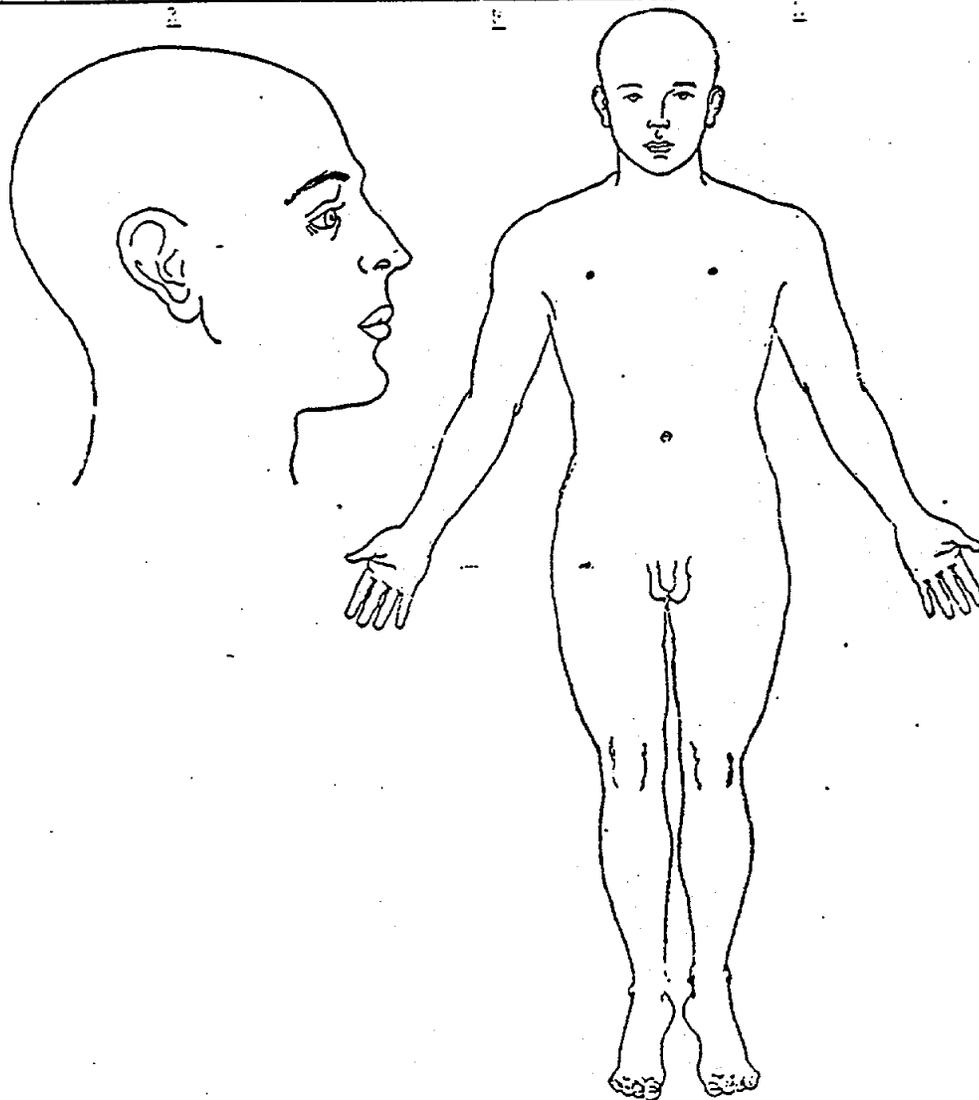
Anatomical Figure (Anterior)

Anatomical Figure (Posterior)

Nerve Conduction Velocities

Psychometric De-Briefing Form

CLINICAL RECORD	ANATOMICAL FIGURE
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PATIENT'S IDENTIFICATION (For typed or written entries give: Name—last, first, middle; grade; date; hospital or medical facility)

REGISTER NO.

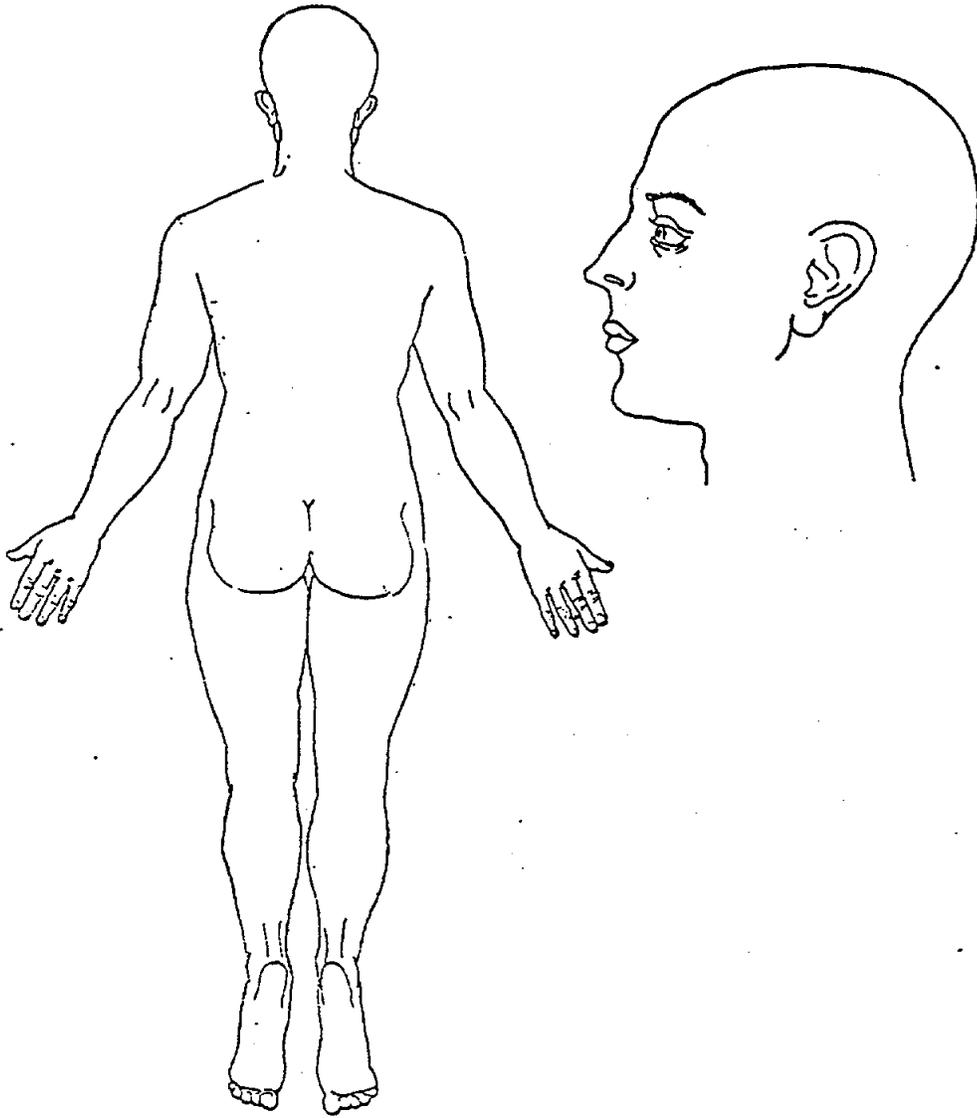
WARD NO.

ANATOMICAL FIGURE
Standard Form 581
531-104

L

R

R



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PAGE NR.		NERVE CONDUCTION VELOCITIES			
SOCIAL SECURITY NUMBER		NAME (Last, First, MI)		GRADE	CASE NR.
DATE OF EXAMINATION		AGE		DATE: _____ TIME: _____ TEMP: _____	
YEAR	MONTH	DAY			

1. Ulnar (one side only) R L Elbow Above Below

Normal Values for Laboratory

Latency / / / / ms / / / /

Distance / / / mm / / /

N.C.V. / / / / m/s / / / /

Stm. Curr. / / / mV / / /

2. Peroneal (one side only) R L

Normal Values for Laboratory

Latency / / / / ms / / / /

Distance / / / mm / / /

N.C.V. / / / / m/s / / / /

Stm. Curr. / / / mV / / /

3. Sural (one side only) R L (If unobtainable, Median or Ulnar Sensory recommend)

Normal Values for Laboratory

Latency / / / / ms / / / /

Distance / / / mm / / /

N.C.V. / / / / m/s / / / /

Stm. Curr. / / / mV / / /

Ranch Hand II: Psychometric De-Briefing Form Continued

<u>Test Score</u>	<u>Valid Results</u>	<u>Reason(s) for Questionably Valid Results</u>	<u>Est of "True" Score/Result</u>
Tactual Performance Test			
Preferred Hand			
Non-Preferred Hand			
Both Hands			
Memory			
Localization			
Speech-Sounds Perception			
Seashore Rhythm			
Finger Tapping			
Preferred Hand			
Non-Preferred Hand			
Trail Making Test			
Part A			
Part B			
Grip Strengths			
Preferred Hand			
Non-Preferred Hand			
4. WMS I			
Logical Mem (immed)			
Visual Repro (immed)			
Associate Lrng			
Logical Mem (delayed)			
Visual Repro (delayed)			
5. Cornell Index			
6. MMPI (overall rating of protocol)			WNL or ONL