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PROJECT RANCH HAND II

EXAMINER'S HANDBOOK

AIR FORCE WORKING PAPER

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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 are not available to him. The compilation and analysis of data will be performed by the study investigators at Brooks Air Force Base, Texas. They will notify the subject and the physician of his choice of the results of the examination.

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 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 to establish the presence of physical findings, if any exist. 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. Formulation of impressions 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. The examining physician must avoid an expression of opinion regarding the interpretation of any findings particularly with regards to possible etiologies. 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. If during the examination, the examining physician finds evidence of present illness requiring further medical attention, he should so state to 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 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) On arrival at the examining facility the subject should be briefed on the appointments which have been arranged, their times, and locations.

(2) Collation and forwarding of examination results

A checklist for the mailing of data will be provided. It should be retained by the office primarily responsible (OPR) for the Project RANCH HAND II examination and used to ascertain that all necessary items have been completed and received, or have been directly forwarded by the section performing the examinations. When the OPR for the examinations is ready to forward all materials, the checklist for mailing should be endorsed with the date of mailing as a letter of transmittal and included in the package of material to be mailed to USAFSAM/EK, Brooks AFB TX 78235.

(3) Forms for individual examinations and procedures

The blank forms included for various examinations and procedures may be carried by the patient so as to be available to the examiner or to the laboratory, or to the department of radiology, as the patient reports for his examinations in those functions. The forms pertaining to the specific function may be withdrawn from the patient's examination package and later returned to the office of primary responsibility.

SECTION	PHYSICAL EXAMINATION	SUBJECT NUMBER
1. GENERAL APPEARANCE a. <input type="checkbox"/> Ectomorph b. <input type="checkbox"/> Mesomorph c. <input type="checkbox"/> Endomorph d. <input type="checkbox"/> Undernourished e. <input type="checkbox"/> Well-nourished f. <input type="checkbox"/> Obese g. Appearance (1) <input type="checkbox"/> Younger (2) <input type="checkbox"/> Same (3) <input type="checkbox"/> Older as stated age. h. Appearance of illness or distress <input type="checkbox"/> Yes <input type="checkbox"/> No i. Hair Distribution <input type="checkbox"/> Normal <input type="checkbox"/> Abnormal <input type="checkbox"/> Hirsutism <input type="checkbox"/> Alopecia		
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, papilledema. <input type="checkbox"/> A-V nicking <input type="checkbox"/> Hemorrhages <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"/> Nodules <input type="checkbox"/> Tenderness <input type="checkbox"/> Parotid gland enlargement <input type="checkbox"/> R <input type="checkbox"/> L		
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 <input type="checkbox"/> Rales <input type="checkbox"/> Hyperresonance <input type="checkbox"/> Dullness Circumference at nipple level Expiration _____ cm 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 - Specify: _____ cm Liver Span <input type="checkbox"/> Tenderness <input type="checkbox"/> Splenomegaly <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 NORMAL ABNORMAL Indicate type and location of lesions on attached anatomical figure.

<input type="checkbox"/> Comedones	<input type="checkbox"/> Hyperpigmentation	<input type="checkbox"/> Petechiae
<input type="checkbox"/> Acneiform lesions	<input type="checkbox"/> Jaundice	<input type="checkbox"/> Ecchymoses
<input type="checkbox"/> Acneiform scars	<input type="checkbox"/> Spider angiomata	<input type="checkbox"/> Lesions Woods Light (UV) Positive
<input type="checkbox"/> Depigmentation	<input type="checkbox"/> Palmar erythema	
<input type="checkbox"/> Inclusion cysts		
<input type="checkbox"/> Cutis Rhomboidalis (Obtain photographs of major lesions)		

14. MUSCULOSKELETAL NORMAL ABNORMAL

<input type="checkbox"/> Muscle - Specify:	<input type="checkbox"/> Spine	
<input type="checkbox"/> Weakness	<input type="checkbox"/> Scoliosis	
<input type="checkbox"/> Tenderness	<input type="checkbox"/> Kyphosis	
<input type="checkbox"/> Abnormal Consistency	<input type="checkbox"/> Tenderness, Level _____	
<input type="checkbox"/> Atrophy	<input type="checkbox"/> Decreased range of motion	<input type="checkbox"/> Pelvic tilt
		<input type="checkbox"/> Straight Leg Raising: Right/Left

15. GENITOURINARY - RECTAL - HERNIA NORMAL ABNORMAL

<input type="checkbox"/> Inguinal hernia <input type="checkbox"/> R <input type="checkbox"/> L	<input type="checkbox"/> Varicocele	<input type="checkbox"/> Hemorrhoids
<input type="checkbox"/> Testes	<input type="checkbox"/> Epididymis	<input type="checkbox"/> Prostatic Enlargement
Absent Enlarged Atrophic	<input type="checkbox"/> Scrotal mass - Specify _____ cm dia	<input type="checkbox"/> Rectal mass
<input type="checkbox"/> R <input type="checkbox"/> L		
<input type="checkbox"/> Stool Hemacult: <input type="checkbox"/> Positive <input type="checkbox"/> Negative		

16. LYMPH NODES - CHECK ALL AREAS. NORMAL ABNORMAL - SPECIFY CERVICAL, OCCIPITAL, SUPRACLAVICULAR, AXILLARY, EPITRACHLEAR, INGUINAL, FEMORAL

Enlarged _____ Tender _____ Hard _____ Fixed _____ Confluent _____

17. NERVOUS SYSTEM - SEE ATTACHED FORMS

18. HEART AND OTHER OBSERVATIONS (Continued from Item 9)

Murmur No Yes Area Ao Pu Apex S4

Sys

Dia

DATE OF EXAMINATION			TYPED OR PRINTED NAME OF EXAMINING PHYSICIAN	RETURN FORM TO:
MONTH	DAY	YEAR		
EXAMINING FACILITY			SIGNATURE	USAFSAM/ ES BROOKS AFB TX 78235

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) Nonequilibratory (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) Praxis

(b) Handwriting. If indicated, Normal Abnormal

(c) 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
									Babinski		
Biceps			Patellar								
Triceps			Achilles								
Remarks											

MENINGEAL IRRITATION Spurling Maneuver of Neck Normal Abnormal

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)

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

SUMMARY OF POSITIVE FINDINGS
Objective

Subjective

Diagnostic Impression

Date

Signature

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

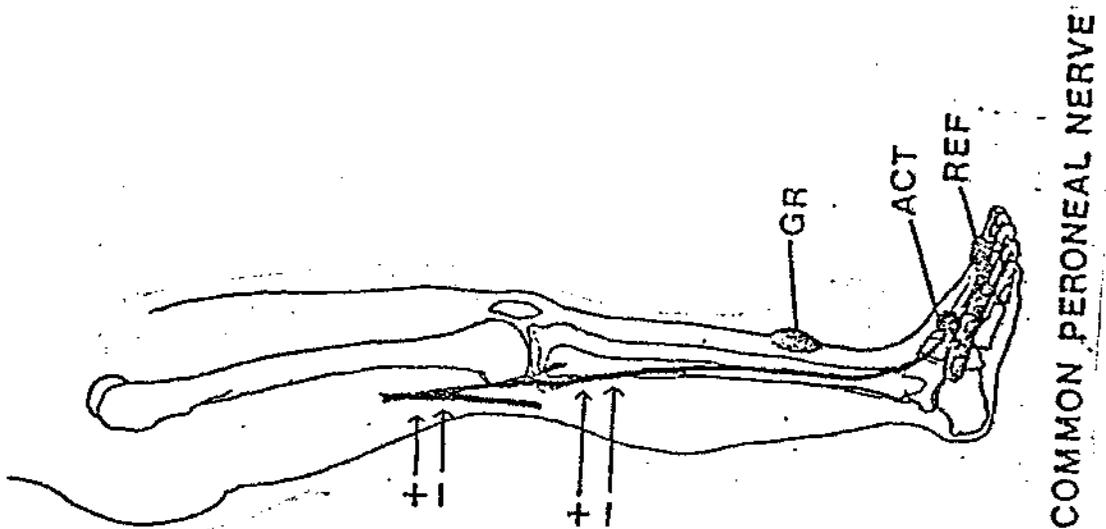
49.9 ± 5.9 M/sec

Distal latency: $4.5 \pm .8$ 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)

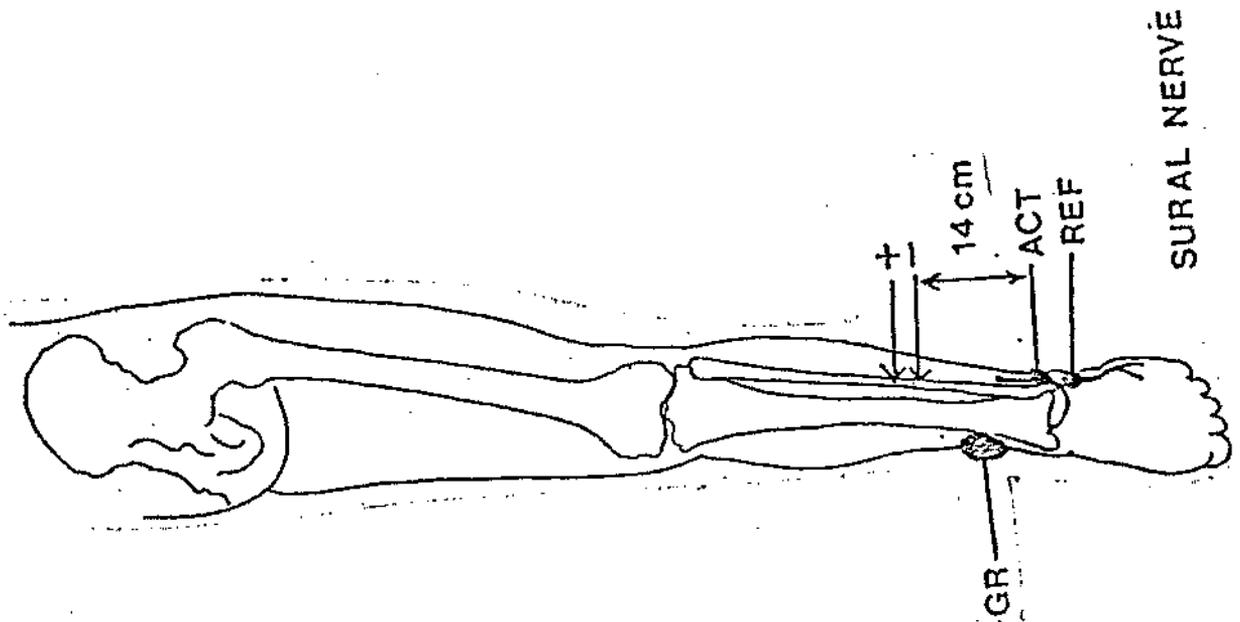


SURAL NERVE

(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:

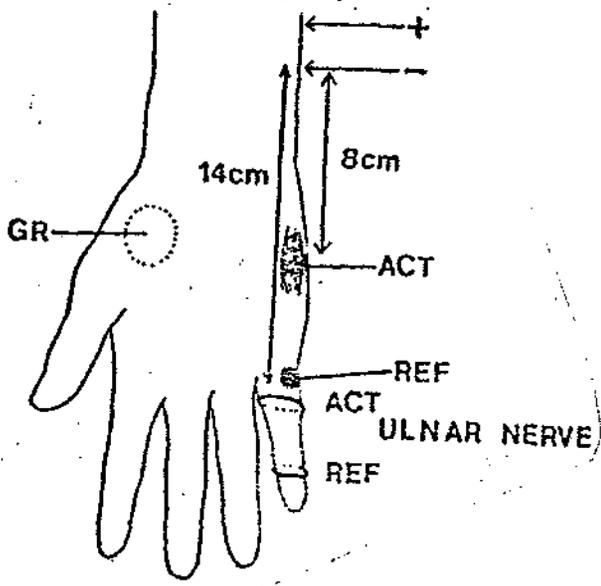
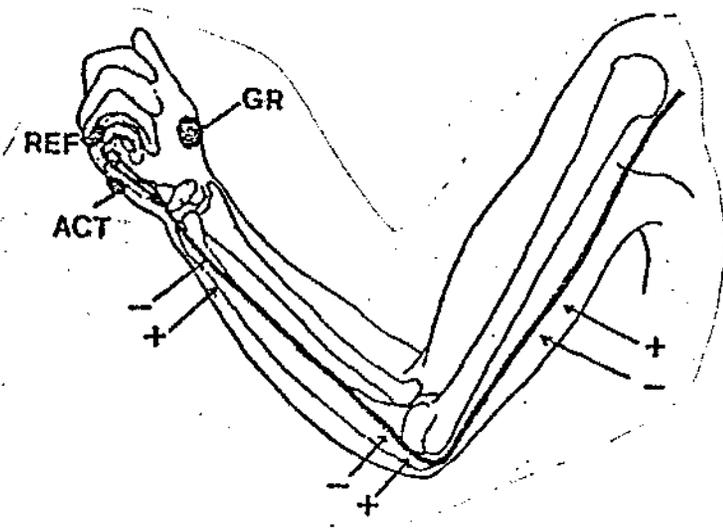
Motor: 3.7 ± .3
Sensory: 3.0 ± .25 Antidromic (peak)
 3.0 ± .25 Orthodromic (peak)

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 examining physician.

(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 so as 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 self-administered and standardized neuropsychiatric symptom and complain 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) Shipping Instructions

Forward all test materials as scored with annotations, interpretations, and impressions to the examining physician in your facility or MAIL DIRECTED TO

USAFSAM/EK
BROOKS AFB TX 78235

and provide copy of letter of transmittal to the examining physician.

(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 Brooks AFB.

(4) Precautions similar to those in Δ3 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 S 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 Brooks AFB. 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.

(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 examining physician.

(d) Interpretation:

(1) The electrocardiograms will be interpreted by physicians in the USAF Central ECG Library and compared to previous individual ECG records in the case of rated (pilot or navigator) subjects.

(2) The interpretation and standard Central Library codes will be recorded on SAM Form 222 and forwarded to USAFSAM/ES.

(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, teleroentgenogram in the PA position using small nipple markers.

(b) Disposition

Forward the original film to the examining physician or mail to

USAFSAM/EK
Brooks AFB TX 78235

(c) Interpretation

USAFSAM/NGFR will interpret the teleroentgenogram and record the results on SAM Form 23. USAFSAM/NGAR will code the Radiologist's diagnosis (ICDA-9) and forward Sam Form 23 to USAFSAM/ES/

(5) 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 non-compliance should be made by the examining physician to aid in the interpretation of the results.

(2) The following is needed:

(a) Blood will be drawn only in the morning into a tube set-up consisting of the following: 4 large 15 ml red top clot tubes and 1 10-ml lavender top EDTA tube.

(b) Label tubes with patient's full name, Social Security Number, date, and time of drawing.

(c) Perform routine hematology and sedimentation rate on the EDTA tube.

(d) Allow clot tubes to fully clot for at least 30 minutes. Centrifuge and separate hemolysis-free serum into screw-cap polypropylene tubes labeled with the patient's full name, Social Security Number, date, and time of drawing. Also label these tubes with the roman numeral I. Freeze tubes at -20°C as soon as possible (not to exceed 2 hours after drawing).

(e) After the drawing of the fasting specimens, administer 40 gms of glucose per square meter of body surface to the patient. Exactly 2 hours later draw one 7 ml red top clot tube. Allow tube to clot for 30 minutes, centrifuge, and separate hemolysis-free serum into a screw cap polypropylene tube. Label this tube with patient's full name, Social Security Number, date, and time of drawing. Label this tube "Ip.p." Freeze at -20°C as soon as possible not to exceed 2 hours after drawing.

(f) Ship all specimens frozen, packed in dry ice, by Federal Express-Priority one. Submit a patient list containing patient's full name, Social Security Number, and date of drawing. Address to:

USAFSAM/NGP
BLDG 125, Rm W-21
Brooks AFB, TX 78235

WARNING: DO NOT SHIP ON WEEKENDS, THURSDAY OR FRIDAY, OR ON ANY DAY PRIOR TO A FEDERAL HOLIDAY.

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(3) The RANCH HAND II Protocol calls for a standard complete blood count, RBC indices, erythrocyte sedimentation rate, and routine urinalysis including a "dip stick" test for porphobilinogen and semen analysis. Since these tests must be done promptly, it is requested that the laboratory of the examining facility draw specimens and accomplish these procedures according to the laboratory's usual routine and forward the results to the examining physician at that facility.

(4) The RANCH HAND II Protocol calls for determination of delta-aminolevulinic acid and products of porphyrin metabolism. For these studies freeze (-20°C) a 100 ml aliquot of urine. The 100 cc urine aliquot must be acidified with 1 ml of glacial acetic acid. Collection of urine should be mid-morning of second day after blood for hormone analysis is drawn. Specific instructions for shipping these specimens will be supplied by USAFSAM/NGP.

(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, the following instructions are critical:

(1) Patients should be fasting prior to drawing blood for hormone analysis.

(2) Exact time of each drawing should be recorded on each tube.

(3) One small clot tube (7 ml--without anticoagulant) should be drawn every 20 minutes for one hour. Patients should be kept at rest during the one-hour period. They should not smoke or drink stimulants (coffee or tea).

(4) RBCs should be separated from the serum within 2 hours of drawing the sample and the serum and the serum frozen as soon as possible at -20°C in 3 screw-top vials.

(5) Label each of 3 screw-top vials with time, date, and patients name followed by Roman numeral II.

(6) Ship specimens in dry ice in special containers by Federal Express-Priority One. Do not ship on Thursday, Friday, or the day before federal holidays.

(c) Specific Tests

(1) Performed at the Examining Facility

- (a) Hematocrit
- (b) Hemoglobin
- (c) RBC Indices
- (d) White Blood Cell Count
- (e) Platelet Count
- (f) Erythrocyte Sedimentation Rate
- (g) Urinalysis
- ~~(h) Semen Analysis (Number, Motility, Morphology)~~

(2) Performed by USAFSAM Clinical Pathology Laboratory

- (a) Blood Urea Nitrogen
- (b) Fasting Plasma Glucose
- (c) Creatinine
- (d) 2-hour Post Prandial Plasma Glucose
- (e) Differential Cortisol (0730 and 0930 hours)
- (f) Cholesterol & HDL cholesterol
- (g) Triglycerides
- (h) SGOT
- (i) SGPT
- (j) GGTP
- (k) Alkaline Phosphatase
- (l) LDH
- (m) Serum Protein Electrophoresis

- (n) CPK
- (o) VDRL
- (3) Performed by USAFSAM Epidemiology Division Reference Laboratory
 - (a) LH
 - (b) FSH
 - (c) Testosterone
 - (d) Thyroid Profile (RIA)
 - (e) Delta-aminolevulinic Acid
 - (f) Urine Porphyrins
- (4) Performed at USAFSAM if liver function studies are abnormal
 - (a) Anti-nuclear Antibody
 - (b) Hepatitis Antigens/Antibodies (A and B)
- (5) Performed if medical history indicates an increase in infectious diseases:
 - (a) Immuno electrophoresis
 - (b) Monilia Skin Test
 - (c) Quantitative Immunoglobulin Determinations
 - (d) 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.

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
- (5) Reticuloendothelial system:
 - (a) White blood cell count
 - (b) Differential
 - (c) Serum protein electrophoresis
 - (d) Selective use of skin testing, immunoelectrophoresis and quantitative immunoglobulin determination
- (6) Hepatic screen:
 - (a) SGOT
 - (b) SGPT
 - (c) GGTP
 - (d) Alkaline phosphatase
 - (e) LDH
 - (f) Cholesterol
 - (g) HDL cholesterol
 - (h) Triglyceride
 - (i) Urine porphyrins
 - (j) Urine porphobilinogen
- (7) Renal screen:
 - (a) Urinalysis
 - (b) BUN
 - (c) Creatinine
- (8) Endocrine screen
 - (a) Differential cortisol (0730 and 0930 hours)

E. Forms

Anatomical Figure (Anterior)

Anatomical Figure (Posterior)

Nerve Conduction Velocities

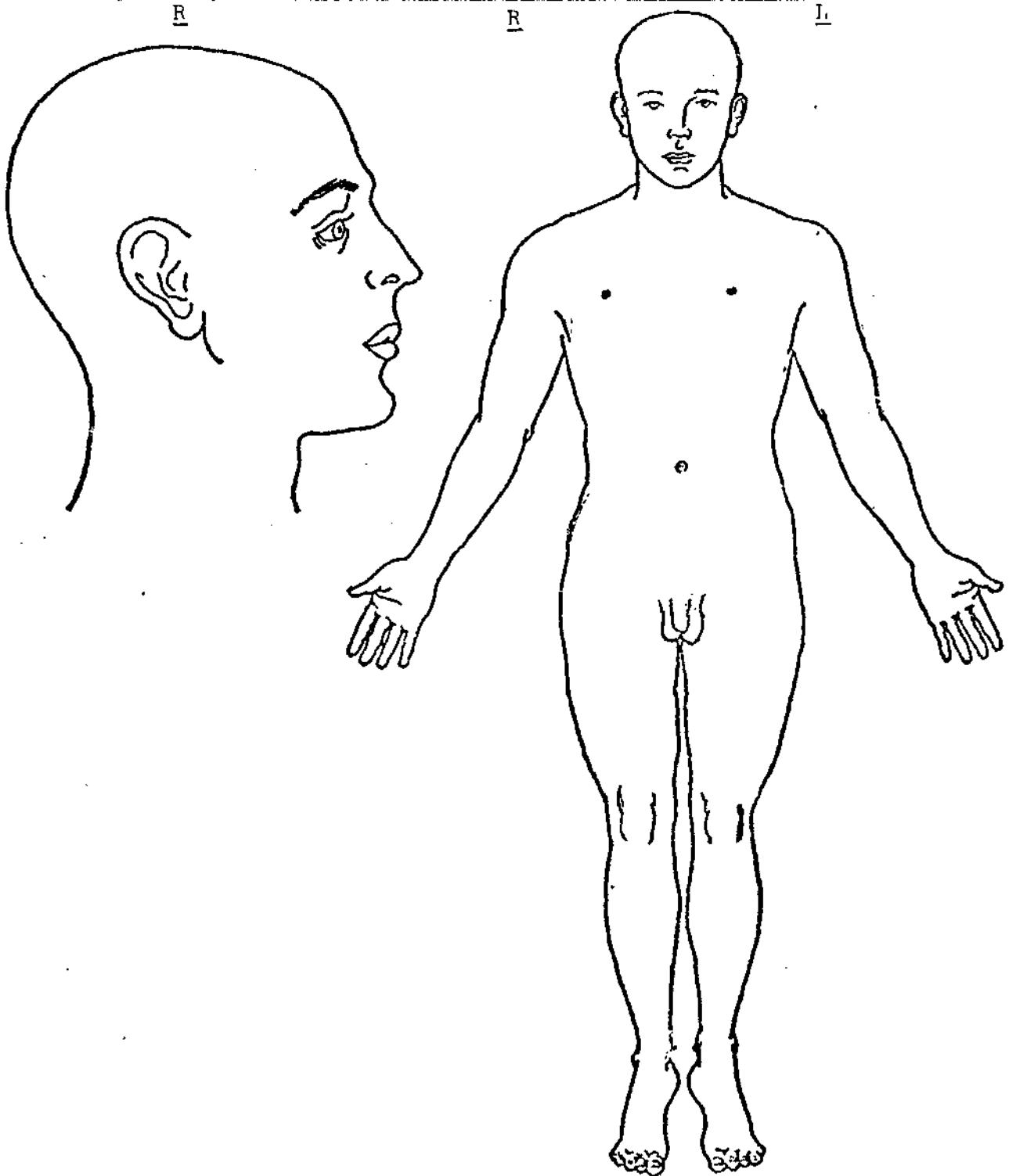
Psychometric De-Briefing Form

Radiographic Data

Electrocardiographic Studies

CLINICAL RECORD

ANATOMICAL FIGURE



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

REGISTER NO.

WARD NO.

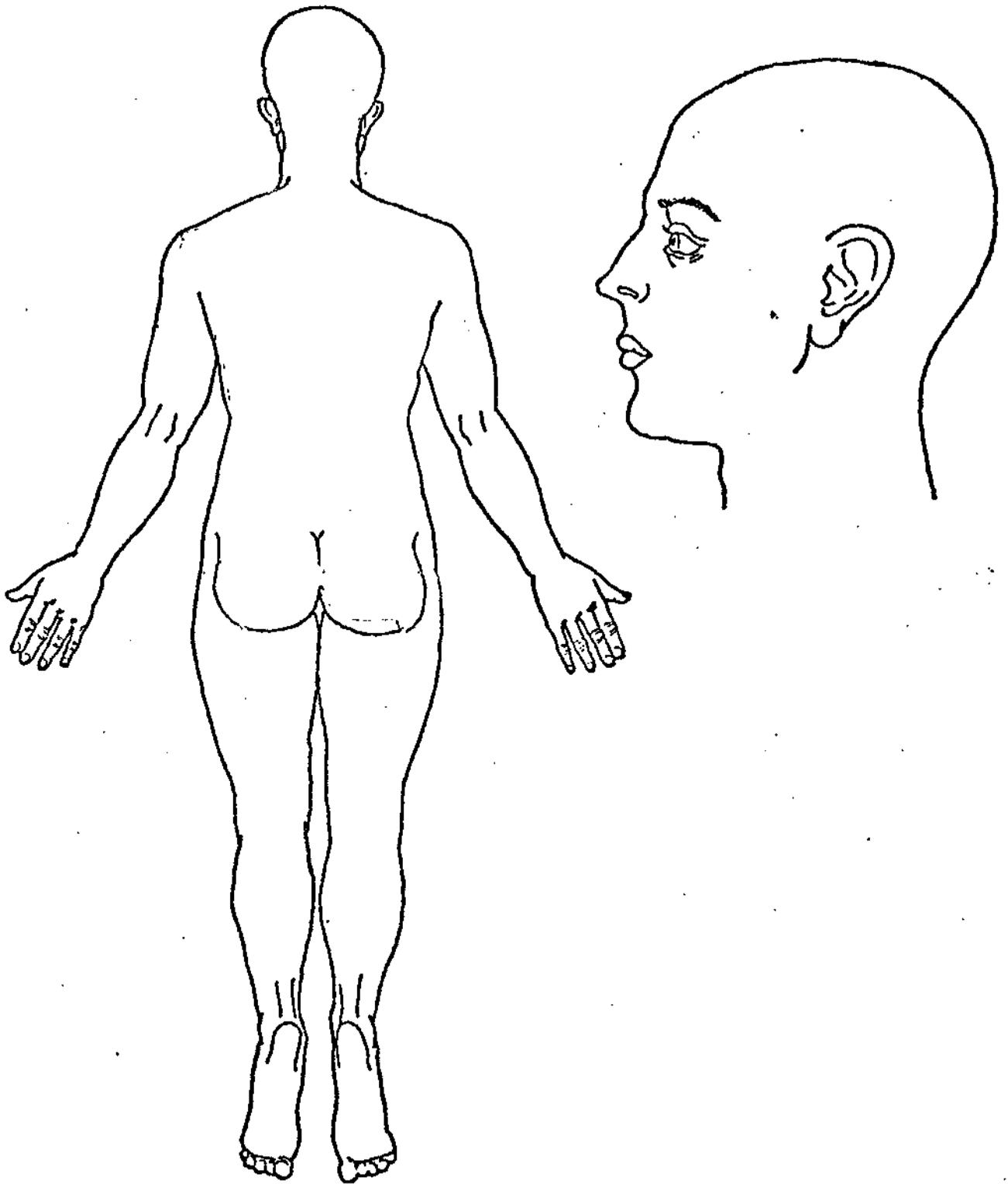
ANATOMICAL FIGURE
Standard Form 681

51-134

L

R

L



U.S. GOVERNMENT PRINTING OFFICE (1953-O-711-787)

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NERVE CONDUCTION VELOCITIES

SOCIAL SECURITY NUMBER

NAME (Last, First, MI)

GRADE

CASE NR.

DATE OF EXAMINATION

AGE

YEAR MONTH DAY

DATE: _____ TIME: _____ TEMP: _____

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. / / / mA / / /

2. Peroneal (one side only) R L

Normal Values for Laboratory

Latency / / . / / ms / / . / /Distance / / / mm / / /N.C.V. / / . / / m/s / / . / /Stm. Curr. / / / mA / / /

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. / / / mA / / /

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

PAGE NR.		40 RADIOGRAPHIC DATA					
SOCIAL SECURITY NUMBER		NAME (<i>Last, First, MI</i>)				GRADE	CASE NUMBER
DATE OF REQUEST			SEX	AGE	ORGANIZATION	REQUESTED BY	X-RAY NUMBER
YEAR	MONTH	DAY					
EXAMINATION REQUESTED							
PERTINENT CLINICAL HISTORY							
RADIOGRAPHIC REPORT							
DATE OF REPORT			SIGNATURE				

PAGE NR.

11 ELECTROCARDIOGRAPHIC STUDIES

SOCIAL SECURITY NUMBER

NAME (Last, First, MI)

GRADE

CASE NUMBER

I. DATE OF EXAM

YEAR MONTH DAY

6. ROUTINE TRACING

A. RATE (beats/min)

B. PR (sec)

C. QRS (sec)

D. QT (sec)

E. MEAN QRS AXIS

F. WITH TRANSITION AT

G. MEAN T AXIS

H. WITH TRANSITION AT

I. WITH T-WAVES UPRIGHT IN

J. IMPRESSION

DIAGNOSES (code)

1.			4.		
2.			5.		
3.			6.		

2. TEST RUN NR.

3. AGE

4. HEIGHT (IN)

5. WEIGHT (LBS)

7. PRECORDIAL MAP

A. INTERPRETATION

--	--	--

B. COMMENTS

8. MASTER TWO-STEP TEST

A. DATE

YEAR MONTH DAY

B. TEST RUN NR.

C. FASTING

1-YES 2-NO

D. 1-SINGLE

2-DOUBLE

L. COMMENTS

BASELINE	B.P.		H.R.
	SYST	DIAST	
E. 1ST			
F. 2ND			
G. 3RD			
H. POST EXER- CISE IMMED.			
I. 2 MIN			
J. 5 MIN			
K. 1. INTERPRETA- TION			
2. REPOLARI- ZATION			
3. ARRHYTH- MIA			

PROJECT RANCH HAND II

EXAMINER'S HANDBOOK

AIR FORCE WORKING PAPER

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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 are not available to him. The compilation and analysis of data will be performed by the study investigators at Brooks Air Force Base, Texas. They will notify the subject and the physician of his choice of the results of the examination.

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 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 to establish the presence of physical findings, if any exist. 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 falacious 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. Formulation of impressions 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. The examining physician must avoid an expression of opinion regarding the interpretation of any findings particularly with regards to possible etiologies. 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. If during the examination, the examining physician finds evidence of present illness requiring further medical attention, he should so state to 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 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) On arrival at the examining facility the subject should be briefed on the appointments which have been arranged, their times, and locations.

(2) Collation and forwarding of examination results

A checklist for the mailing of data will be provided. It should be retained by the office primarily responsible (OPR) for the Project RANCH HAND II examination and used to ascertain that all necessary items have been completed and received, or have been directly forwarded by the section performing the examinations. When the OPR for the examinations is ready to forward all materials, the checklist for mailing should be endorsed with the date of mailing as a letter of transmittal and included in the package of material to be mailed to USAFSAM/EK, Brooks AFB TX 78235.

(3) Forms for individual examinations and procedures

The blank forms included for various examinations and procedures may be carried by the patient so as to be available to the examiner or to the laboratory, or to the department of radiology, as the patient reports for his examinations in those functions. The forms pertaining to the specific function may be withdrawn from the patient's examination package and later returned to the office of primary responsibility.

SECTION **PHYSICAL EXAMINATION (Continued)**

12. PERIPHERAL PULSES	NORMAL	DIMIN.	ABSENT	COMMENTS
RADIAL				
FEMORAL				
POPLITEAL				
DORSALIS PEDIS				
POSTERIOR TIBIAL				

13. SKIN NORMAL ABNORMAL Indicate type and location of lesions on attached anatomical figure.

<input type="checkbox"/> Comedones	<input type="checkbox"/> Hyperpigmentation	<input type="checkbox"/> Petechiae
<input type="checkbox"/> Acneiform lesions	<input type="checkbox"/> Jaundice	<input type="checkbox"/> Ecchymoses
<input type="checkbox"/> Acneiform scars	<input type="checkbox"/> Spider angiomata	<input type="checkbox"/> Lesions Woods Light (UV) Positive
<input type="checkbox"/> Depigmentation	<input type="checkbox"/> Palmar erythema	
<input type="checkbox"/> Inclusion cysts		
<input type="checkbox"/> Cutis Rhomboidalis (Obtain photographs of major lesions)		

14. MUSCULOSKELETAL NORMAL ABNORMAL

<input type="checkbox"/> Muscle - Specify:	<input type="checkbox"/> Spine	
<input type="checkbox"/> Weakness	<input type="checkbox"/> Scoliosis	
<input type="checkbox"/> Tenderness	<input type="checkbox"/> Kyphosis	
<input type="checkbox"/> Abnormal Consistency	<input type="checkbox"/> Tenderness, Level	
<input type="checkbox"/> Atrophy	<input type="checkbox"/> Decreased range of motion	<input type="checkbox"/> Pelvic tilt
		<input type="checkbox"/> Straight Leg Raising: Right/Left

15. GENITOURINARY - RECTAL - HERNIA NORMAL ABNORMAL

<input type="checkbox"/> Inguinal hernia <input type="checkbox"/> R <input type="checkbox"/> L	<input type="checkbox"/> Varicocele	<input type="checkbox"/> Hemorrhoids
<input type="checkbox"/> Testes	<input type="checkbox"/> Epididymis	<input type="checkbox"/> Prostatic Enlargement
Absent Enlarged Atrophic	<input type="checkbox"/> Scrotal mass - Specify _____ cm dia	<input type="checkbox"/> Rectal mass
<input type="checkbox"/> R <input type="checkbox"/> L		
	Stool Hemacult: <input type="checkbox"/> Positive <input type="checkbox"/> Negative	

16. LYMPH NODES - CHECK ALL AREAS. NORMAL ABNORMAL - SPECIFY CERVICAL, OCCIPITAL, SUPRACLAVICULAR, AXILLARY, EPITRACHLEAR, INGUINAL, FEMORAL

Enlarged _____ Tender _____ Hard _____ Fixed _____ Confluent _____

17. NERVOUS SYSTEM - SEE ATTACHED FORMS

18. HEART AND OTHER OBSERVATIONS (Continued from Item 9)

Murmur No Yes Area Ao Pu Apex S4

Sys

Dia

DATE OF EXAMINATION			TYPED OR PRINTED NAME OF EXAMINING PHYSICIAN	RETURN FORM TO:
MONTH	DAY	YEAR		
EXAMINING FACILITY			SIGNATURE	USAFSAM/ ES BROOKS AFB TX 78235

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) Nonequilibratory (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) Praxis

(b) Handwriting. If indicated, Normal Abnormal

(c) 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
									Babinski		
Biceps			Patellar								
Triceps			Achilles								
Remarks											

MENINGEAL IRRITATION Spurling Maneuver of Neck Normal Abnormal
 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)

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

SUMMARY OF POSITIVE FINDINGS
Objective

Subjective

Diagnostic Impression

Date Signature

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

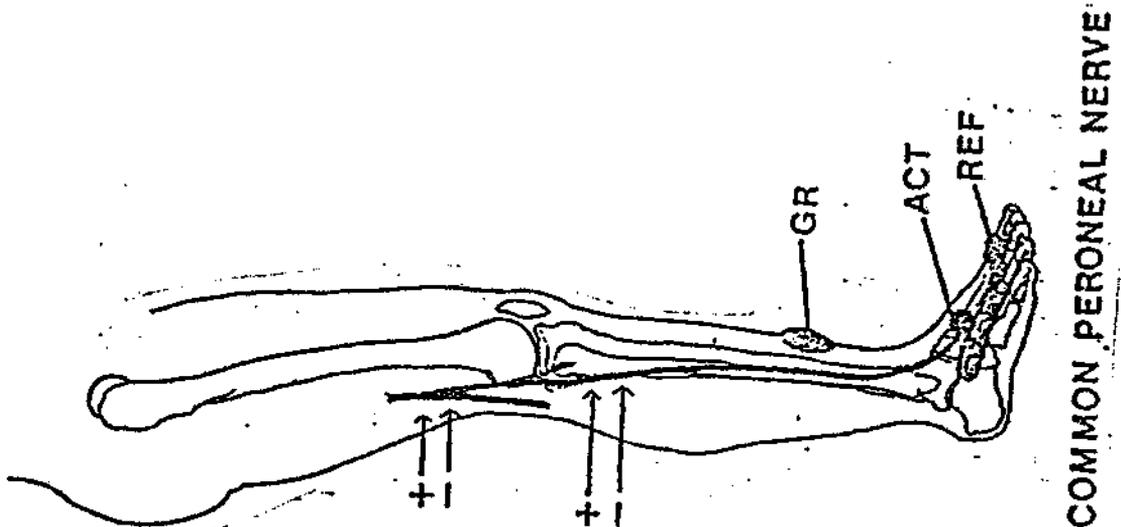
49.9 ± 5.9 M/sec

Distal latency: $4.5 \pm .8$ 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)

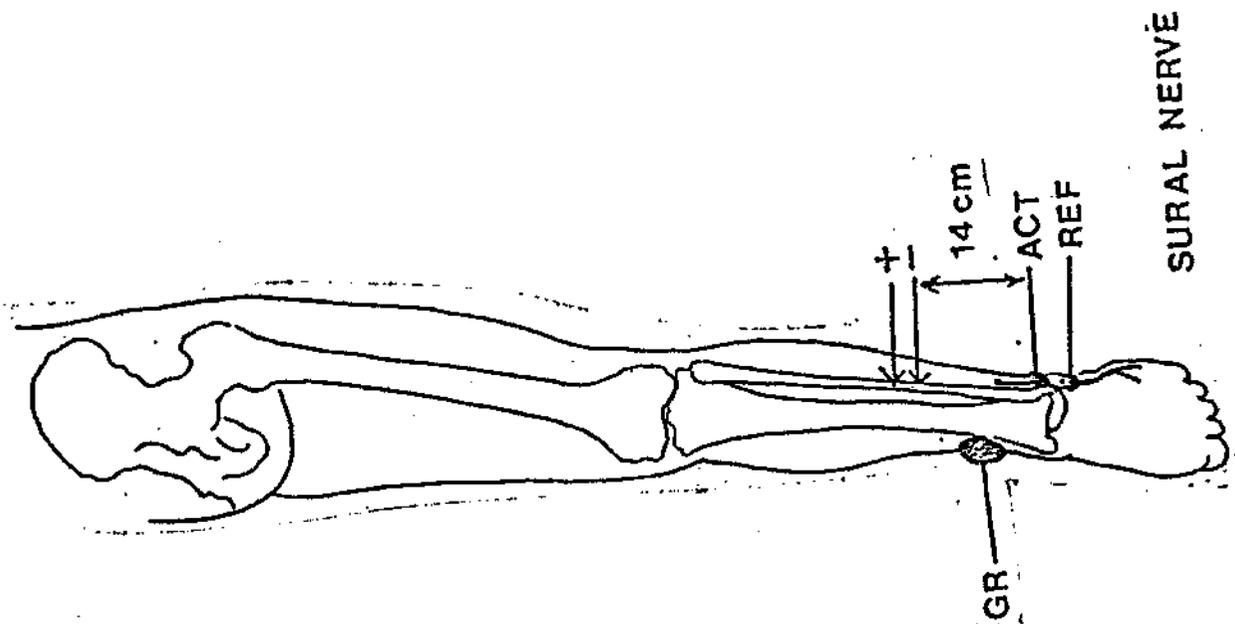


SURAL NERVE

(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:

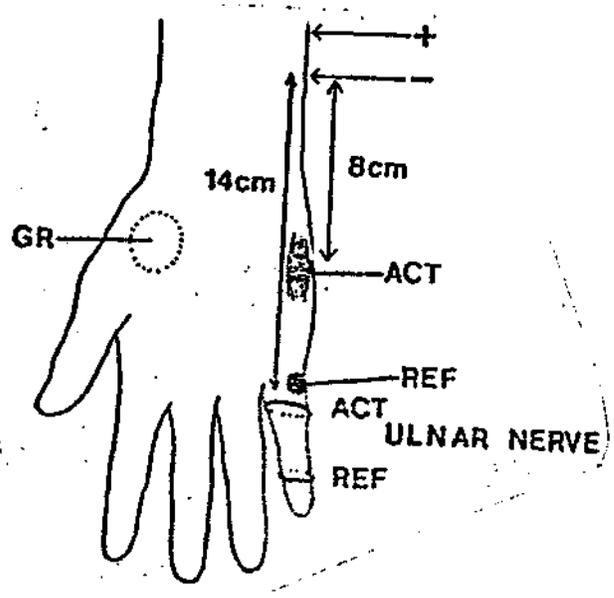
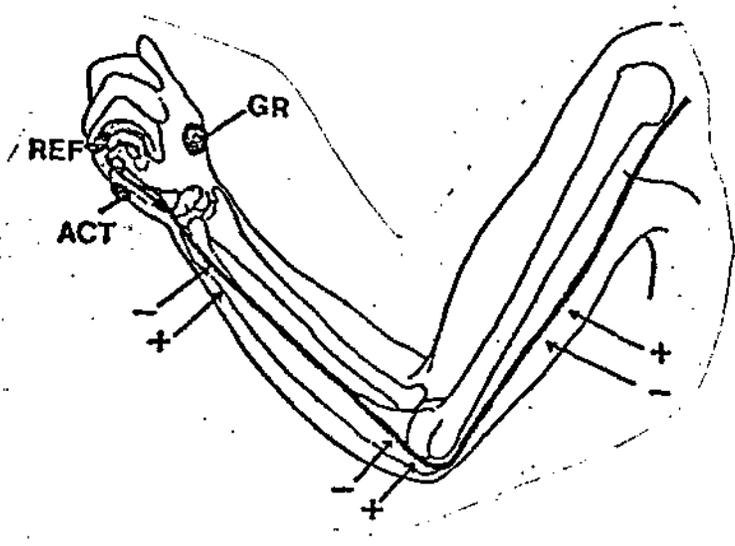
Motor: 3.7 ± .3
Sensory: 3.0 ± .25 Antidromic (peak)
 3.0 ± .25 Orthodromic (peak)

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 examining physician.

(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 airmen 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 so as 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 self-administered and standardized neuropsychiatric symptom and complain 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) Shipping Instructions

Forward all test materials as scored with annotations, interpretations, and impressions to the examining physician in your facility or MAIL DIRECTED TO

USAFSAM/EK
BROOKS AFB TX 78235

and provide copy of letter of transmittal to the examining physician.

(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 Brooks AFB.

(4) Precautions similar to those in Δ3 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 S 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 Brooks AFB. 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.

(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 examining physician.

(d) Interpretation:

(1) The electrocardiograms will be interpreted by physicians in the USAF Central ECG Library and compared to previous individual ECG records in the case of rated (pilot or navigator) subjects.

(2) The interpretation and standard Central Library codes will be recorded on SAM Form 222 and forwarded to USAFSAM/ES.

(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, teleroentgenogram in the PA position using small nipple markers.

(b) Disposition

Forward the original film to the examining physician or mail to

USAFSAM/EK
Brooks AFB TX 78235

(c) Interpretation

USAFSAM/NGFR will interpret the teleroentgenogram and record the results on SAM Form 23. USAFSAM/NGAR will code the Radiologist's diagnosis (ICDA-9) and forward Sam Form 23 to USAFSAM/ES/

(5) 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 non-compliance should be made by the examining physician to aid in the interpretation of the results.

(2) The following is needed:

(a) Blood will be drawn only in the morning into a tube set-up consisting of the following: 4 large 15 ml red top clot tubes and 1 10-ml lavender top EDTA tube.

(b) Label tubes with patient's full name, Social Security Number, date, and time of drawing.

(c) Perform routine hematology and sedimentation rate on the EDTA tube.

(d) Allow clot tubes to fully clot for at least 30 minutes. Centrifuge and separate hemolysis-free serum into screw-cap polypropylene tubes labeled with the patient's full name, Social Security Number, date, and time of drawing. Also label these tubes with the roman numeral I. Freeze tubes at -20°C as soon as possible (not to exceed 2 hours after drawing).

(e) After the drawing of the fasting specimens, administer 40 gms of glucose per square meter of body surface to the patient. Exactly 2 hours later draw one 7 ml red top clot tube. Allow tube to clot for 30 minutes, centrifuge, and separate hemolysis-free serum into a screw cap polypropylene tube. Label this tube with patient's full name, Social Security Number, date, and time of drawing. Label this tube "Ip.p." Freeze at -20°C as soon as possible not to exceed 2 hours after drawing.

(f) Ship all specimens frozen, packed in dry ice, by Federal Express-Priority one. Submit a patient list containing patient's full name, Social Security Number, and date of drawing. Address to:

USAFSAM/NGP
BLDG 125, Rm W-21
Brooks AFB, TX 78235

WARNING: DO NOT SHIP ON WEEKENDS, THURSDAY OR FRIDAY, OR ON ANY DAY PRIOR TO A FEDERAL HOLIDAY.

AIR FORCE WORKING PAPER

(3) The RANCH HAND II Protocol calls for a standard complete blood count, RBC indices, erythrocyte sedimentation rate, and routine urinalysis including a "dip stick" test for porphobilinogen and semen analysis. Since these tests must be done promptly, it is requested that the laboratory of the examining facility draw specimens and accomplish these procedures according to the laboratory's usual routine and forward the results to the examining physician at that facility.

(4) The RANCH HAND II Protocol calls for determination of delta-aminolevulinic acid and products of porphyrin metabolism. For these studies freeze (-20°C) a 100 ml aliquot of urine. The 100 cc urine aliquot must be acidified with 1 ml of glacial acetic acid. Collection of urine should be mid-morning of second day after blood for hormone analysis is drawn. Specific instructions for shipping these specimens will be supplied by USAFSAM/NGP.

(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, the following instructions are critical:

(1) Patients should be fasting prior to drawing blood for hormone analysis.

(2) Exact time of each drawing should be recorded on each tube.

(3) One small clot tube (7 ml--without anticoagulant) should be drawn every 20 minutes for one hour. Patients should be kept at rest during the one-hour period. They should not smoke or drink stimulants (coffee or tea).

(4) RBCs should be separated from the serum within 2 hours of drawing the sample and the serum and the serum frozen as soon as possible at -20°C in 3 screw-top vials.

(5) Label each of 3 screw-top vials with time, date, and patients name followed by Roman numeral II.

(6) Ship specimens in dry ice in special containers by Federal Express-Priority One. Do not ship on Thursday, Friday, or the day before federal holidays.

(c) Specific Tests

(1) Performed at the Examining Facility

- (a) Hematocrit
- (b) Hemoglobin
- (c) RBC Indices
- (d) White Blood Cell Count
- (e) Platelet Count
- (f) Erythrocyte Sedimentation Rate
- (g) Urinalysis

~~(h)~~ Semen Analysis (Number, Motility, Morphology)

(2) Performed by USAFSAM Clinical Pathology Laboratory

- (a) Blood Urea Nitrogen
- (b) Fasting Plasma Glucose
- (c) Creatinine
- (d) 2-hour Post Prandial Plasma Glucose
- (e) Differential Cortisol (0730 and 0930 hours)
- (f) Cholesterol & HDL cholesterol
- (g) Triglycerides
- (h) SGOT
- (i) SGPT
- (j) GGTP
- (k) Alkaline Phosphatase
- (l) LDH
- (m) Serum Protein Electrophoresis

- (n) CPK
- (o) VDRL
- (3) Performed by USAFSAM Epidemiology Division Reference Laboratory
 - (a) LH
 - (b) FSH
 - (c) Testosterone
 - (d) Thyroid Profile (RIA)
 - (e) Delta-aminolevulinic Acid
 - (f) Urine Porphyrins
- (4) Performed at USAFSAM if liver function studies are abnormal
 - (a) Anti-nuclear Antibody
 - (b) Hepatitis Antigens/Antibodies (A and B)
- (5) Performed if medical history indicates an increase in infectious diseases:
 - (a) Immuno electrophoresis
 - (b) Monilia Skin Test
 - (c) Quantitative Immunoglobulin Determinations
 - (d) 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.

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
- (5) Reticuloendothelial system:
 - (a) White blood cell count
 - (b) Differential
 - (c) Serum protein electrophoresis
 - (d) Selective use of skin testing, immunoelectrophoresis and quantitative immunoglobulin determination
- (6) Hepatic screen:
 - (a) SGOT
 - (b) SGPT
 - (c) GGTP
 - (d) Alkaline phosphatase
 - (e) LDH
 - (f) Cholesterol
 - (g) HDL cholesterol
 - (h) Triglyceride
 - (i) Urine porphyrins
 - (j) Urine porphobilinogen
- (7) Renal screen:
 - (a) Urinalysis
 - (b) BUN
 - (c) Creatinine
- (8) Endocrine screen
 - (a) Differential cortisol (0730 and 0930 hours)

E. Forms

Anatomical Figure (Anterior)

Anatomical Figure (Posterior)

Nerve Conduction Velocities

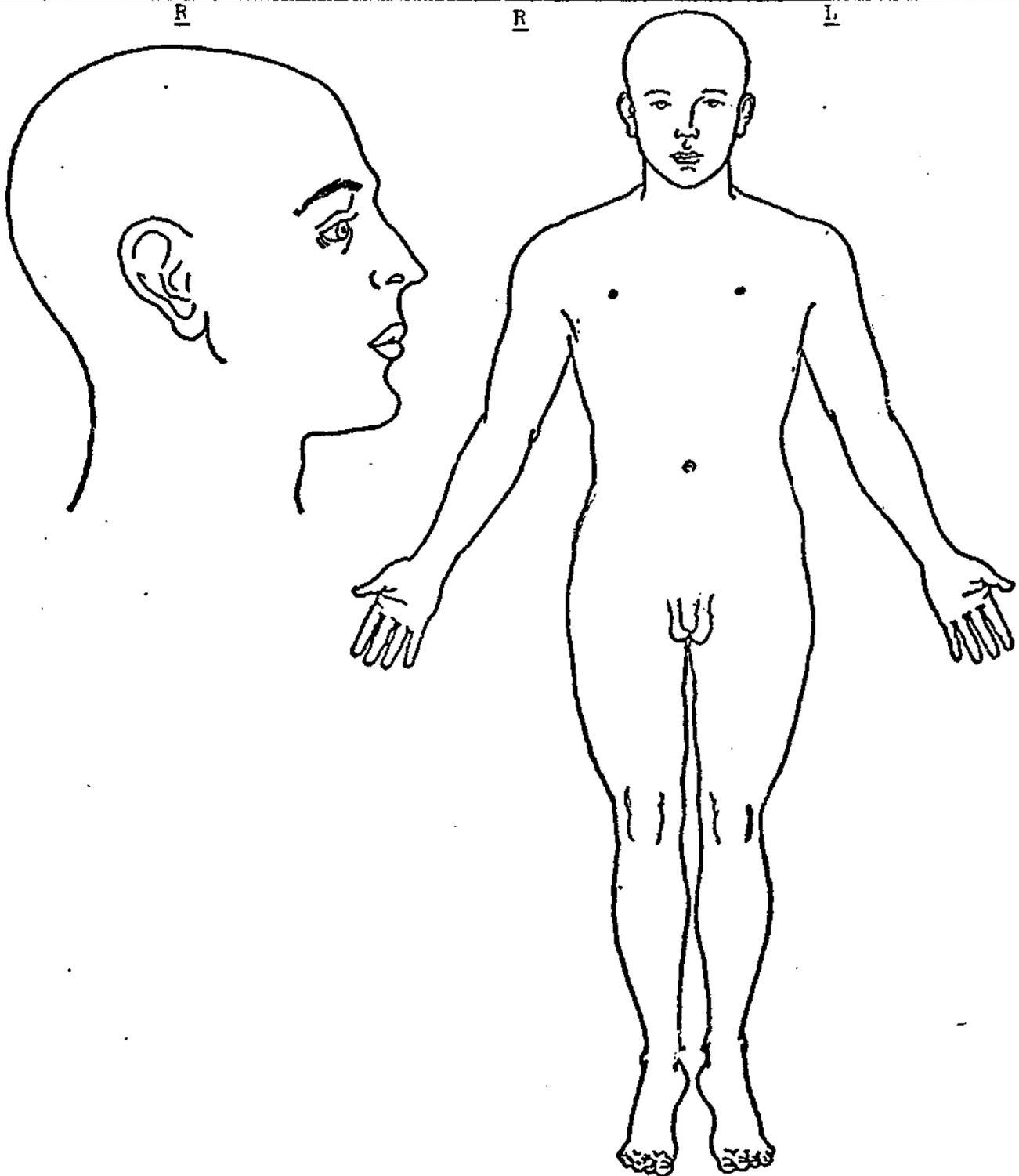
Psychometric De-Briefing Form

Radiographic Data

Electrocardiographic Studies

CLINICAL RECORD

ANATOMICAL FIGURE



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

REGISTER NO.

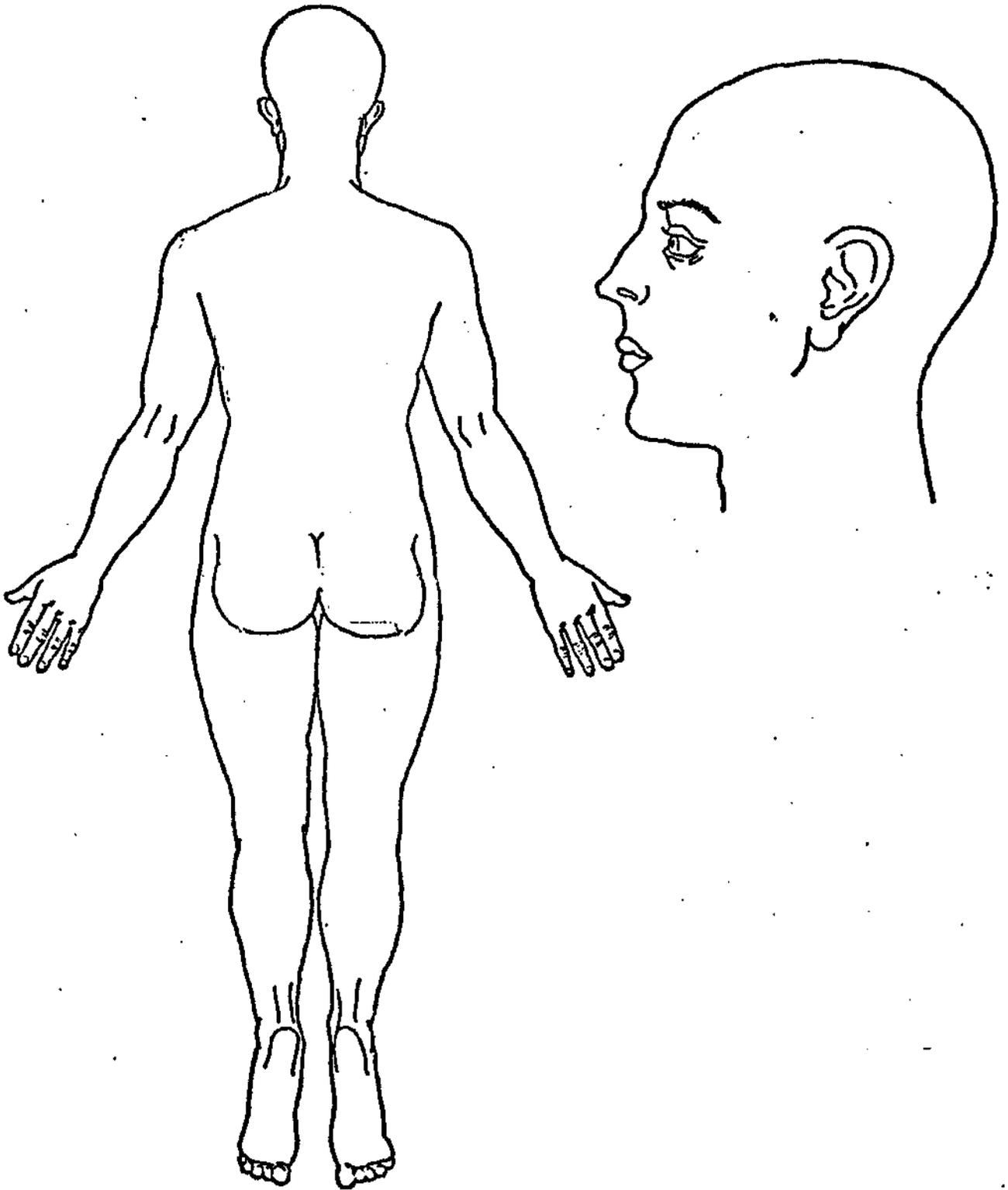
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ANATOMICAL FIGURE
Standard Form 581
31-104

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U.S. GOVERNMENT PRINTING OFFICE: 1973-O-711-787

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PAGE NR.

NERVE CONDUCTION VELOCITIES

SOCIAL SECURITY NUMBER

NAME (Last, First, MI)

GRADE

CASE NR.

DATE OF EXAMINATION

AGE

YEAR MONTH DAY

DATE: _____ TIME: _____ TEMP: _____

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. / / / / mA / / / / 2. Peroneal (one side only) R L

Normal Values for Laboratory

Latency / / ./ / / ms / ./ / / / Distance / / / / mm / / / / N.C.V. / / ./ / / m/s / / ./ / / Stm. Curr. / / / / mA / / / / 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. / / / / mA / / / /

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

PAGE NR.

40 RADIOGRAPHIC DATA

SOCIAL SECURITY NUMBER

NAME (Last, First, MI)

GRADE

CASE NUMBER

DATE OF REQUEST

SEX

AGE

ORGANIZATION

REQUESTED BY

X-RAY NUMBER

YEAR

MONTH

DAY

EXAMINATION REQUESTED

PERTINENT CLINICAL HISTORY

RADIOGRAPHIC REPORT

DATE OF REPORT

SIGNATURE

SOCIAL SECURITY NUMBER	NAME (Last, First, MI)	GRADE	CASE NUMBER
------------------------	------------------------	-------	-------------

1. DATE OF EXAM			6. ROUTINE TRACING			J. IMPRESSION						
YEAR	MONTH	DAY	A. RATE	(beats/min)		DIAGNOSES (code)						
			B. PR	(sec)								
2. TEST RUN NR.			C. QRS	(sec)		1.				4.		
3. AGE			D. QT	(sec)		2.				5.		
4. HEIGHT (IN)			E. MEAN QRS AXIS			3.				6.		
5. WEIGHT (LBS)			F. WITH TRANSITION AT									
			G. MEAN T AXIS									
			H. WITH TRANSITION AT									
			I. WITH T-WAVES UPRIGHT IN									

7. PRECORDIAL MAP

A. INTERPRETATION	<table border="1" style="width: 100%; height: 30px;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%;"></td> <td style="width: 33%;"></td> </tr> </table>				B. COMMENTS

8. MASTER TWO-STEP TEST

A. DATE			B. TEST RUN NR.		L. COMMENTS
YEAR	MONTH	DAY	C. FASTING		
			1-YES 2-NO		
			D. 1-SINGLE 2-DOUBLE		
BASELINE	B.P.		H.R.		
	SYST	DIAST			
E. 1ST					
F. 2ND					
G. 3RD					
POST EXER- H. CISE IMMED.					
I. 2 MIN					
J. 5 MIN					
K. INTERPRETA- TION					
	2. REPOLARI- ZATION				
	3. ARRHYTH- MIA				