DOE 93-20

METHODOLOGY OF MEDICAL MONITORING FOR THE POPULATION OF PALOMARES (SPAIN)

Translation from SPANISH into ENGLISH of "Metologia de la Vigilancia Medica de la Poblacion de Palomares". CIEMAT, May 1991.

Translated for

U.S. Department of Energy
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Translated by

SCITRAN COMPANY
1482 East Valley Road
Santa Barbara, California 93108
(805)969-2413
FAX (805)969-3439

DOE 93-20

GENERAL TECHNICAL SECRETARIAT
SAFETY OFFICE
HEALTH SAFETY UNIT

CIEMAT/SGT/USL/ES/03/91

AMBIENT AND TECHNOLOGICAL
ENERGY, ENVIRONMENT AND TECHNOLOGY
RESEARCH CENTER

CIEMAT

METHODOLOGY OF MEDICAL MONITORING FOR THE POPULATION OF PALOMARES (SPAIN)

HEALTH EVALUATION SERVICE

MAY, 1991

METHODOLOGY OF MEDICAL MONITORING FOR THE POPULATION OF PALOMARES (SPAIN)

MAY, 1991

METHODOLOGY OF MEDICAL MONITORING FOR THE POPULATION OF PALOMARES (SPAIN) /1[1]

1. INTRODUCTION

Medical monitoring of the inhabitants of the village of Palomares (Almeria) is entrusted to the Medical Service of CIEMAT, a branch of the Union of Workers' Health, which has gathered together the functions called for in Decree 1036/1959 calling for a reorganization of the Industrial Medical Service, and of the Order dated 21 November 1959, which approved the Regulations of the Industrial Medical Service. The Service itself has been authorized by the Minister of Health and Consumer Affairs, on 10 Feb 1988, as a Specialized Service for Medical Monitoring of Persons Occupationally Exposed to Ionizing Radiation.

The medical monitoring is for the most part carried out in agreement with the procedures and protocols routinely employed by the CIEMAT Medical Service in monitoring people whose occupation exposes them to ionizing radiation.

2. GOALS

Medical monitoring of referred persons is performed with the following objectives:

1- To establish the state of the general health of people at risk of exposure.

2- To identify the presence of health conditions which could contribute to an increased susceptibility of the individual to develop certain illnesses.

3- To identify in particular the existence of morphological or functional changes to those organs or systems which, playing a role in the toxicokinetics of the

[1] Numbers in margins indicate foreign pagination. Commas in numbers indicate decimals.

contaminants in question, could contribute to an increase in the risk of the incorporation in or suppress the elimination of contaminants from the organism.

4- To provide early detection of the presence of signs or symptoms which could be correlated with the appearance of harmful effects resulting from exposure to radiation.

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5- To attempt to mitigate the concern and anxiety of the population through the psychological effect of medical examination.

3. METHODOLOGY OF MEDICAL MONITORING

In agreement with the ICRP (ICRP, Publication 26), medical monitoring of workers exposed to radiation is based on the general principles of industrial medicine.

In order to efficiently fulfill the goals which have been put forth, an appropriate methodology has been developed and put in place which permits the study, analysis, evaluation and control of the health effects of the general and specific risks to which persons may me exposed. This methodology, which is completely systematic, is based on carrying out medical examinations.

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3.1 PROTOCOLS FOR PROFILING

In the case concerning us, the content of the medical diagoneses results from examining the basic profile, complemented by the subprofile for the specific risk of exposure to ionizing radiation and by those corresponding to the sex and age of each individual.

In TABLE 1 the medical tests routinely used on persons under study are summarized.

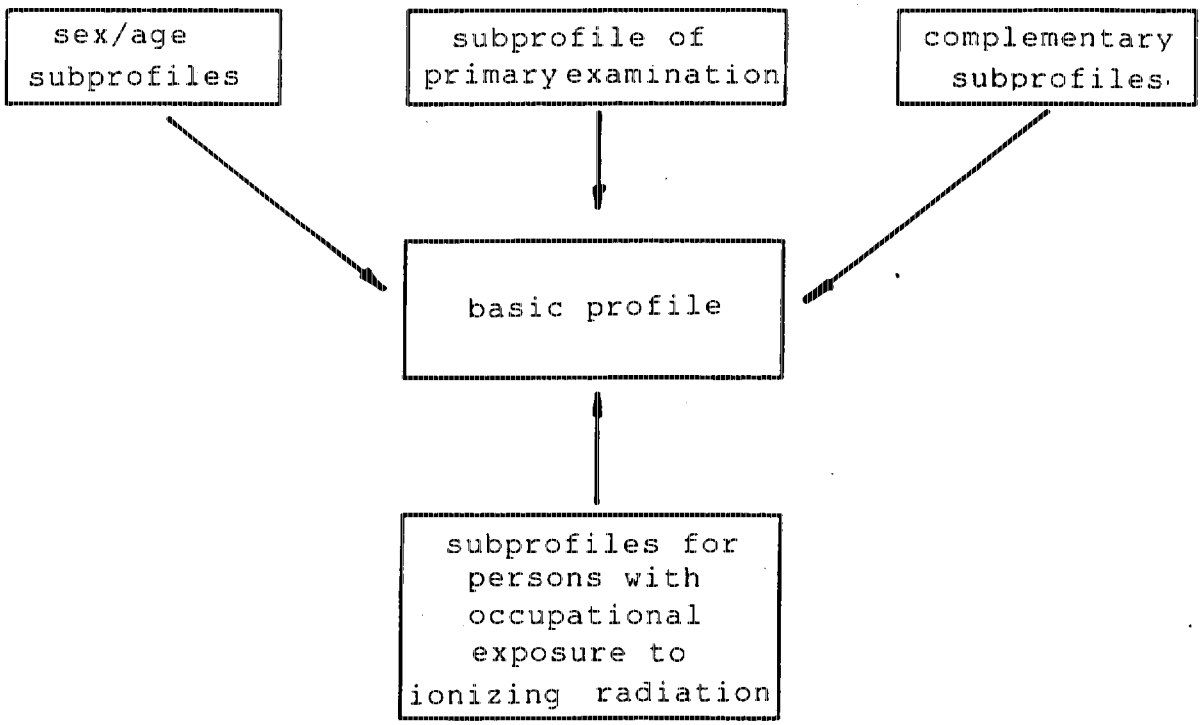
sex/age subprofiles
subprofile of primary examination
complementary subprofiles
basic profile
subprofiles for persons with occupational exposure to ionizing radiation

TABLE 1. CONTENT OF THE MEDICAL DIAGNOSTICS

Medical history	Physical Exam
Vision test	Heamatological test
Resting e.c.g.	Blood chemistry test
Stressed respirometry	Urinalysis
Audiometry	

3.2 DESCRIPTION OF THE PROTOCOL OF MEDICAL MONITORING

1. IDENTIFICATION DATA

- Surname and forenames
- State identity number
- Social security number
- Sex
- Date and place of birth

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2. BIOGRAPHICAL DATA

- Address and phone number
- Married or single
- Number of children
- Reason for exemption from military service
- Family doctor
- Health center used
- Hospital file
- Level of training

3. EMPLOYMENT HISTORY

- Work history (jobs, time worked and risks present; include periods of unemployment.)

- Place of work:
  - Profession and level
  - Employer - address and telephone number
  - Department and section employed in
  - Description and task
  - Identified risks (as posing risks of occupational illnesses)
- Other concurrent jobs (hours and risks)

4. FAMILY HISTORY

- Forebearers
- Descendents

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5. PERSONAL HISTORY

- Diseases (dates).
- Surgery (dates).
- Living Habits
  - Tobacco
  - Alcohol
  - Coffee
  - Other
  - Medicines
  - Special diet
  - Physical exercise
  - Hours of sleep
  - Blood donations (dates)
- Allergies
  - Work related
  - Outside of work
  - To medicine
- Immunizations
  - Vaccinations, with dates
- Gynecological history (women)
  - Menarche
  - Climacteric
  - Pregnancies
  - Pregnancies not carried to term
  - Live births

5. SELF-HISTORY

- Medical interview

6. PHYSICAL EXAMINATION

- Measurements
  - Size
  - Weight (actual and "ideal")
  - Body type
  - Strength of grip

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Examination by organs and systems

- Skin, and adenopathies

  inspection and palpation

- Cardiocirculatory system

  inspection and palpation
  auscultation
  blood pressure

- Respiratory system

  inspection and palpation
  auscultation

- Digestive system

  inspection and palpation

- Genitourinary system

  inspection and palpation
  breasts
  menstruation
  contraceptive methods
  current pregnancy (date of last menses)

- Musculoskeletal system

  inspection, palpation
  mobility

- Nervous system

  inspection
  balance
  skin sensitivity
  reflexes
  walking/coordination
  irregularity in sleeping/waking rhythm

- Endocrine-metabolic systems

  inspection and palpation

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- Ophthalmology

  ametropia
  ocular mobility
  visual acuity
  color vision

- E.N.T.

  inspection, otoscopy
  auditory acuity
  clearness of nasal passages

- General impression

  oral expressivity
  mental agility
  cooperativeness

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7. COMPLEMENTARY TESTING

- Rest E.C.G.
  12 tests
  record heart rhythm for 90 seconds

- Lung volume, forced exhalation
- Screening test for visual function
- Audiometry
    - airborne sound
    - boneborne sound
- Analytic tests
    - Haematology
        - hematies
        - hemoglobin
        - hematocrit
        - VCM
        - HCM
        - CHCM
        - RDW
        - reticulocytes
        - leucocytes
        - leucocyte mix
        - platelets
        - VPM
        - red cell morphology
        - white cell morphology
        - platelet morphology
        - globular precipitation rate (1 & 2 hr)
        - blood group
        - Rh factor

Biochemistry
- glucose
- urea
- creatinine
- uric acid
- total cholesterol
- HDL cholesterol
- IDL cholesterol
- triglycerides
- GOT
- GPT
- gamma GT
- total bilirubin
- direct bilirubin
- indirect bilirubin
- alkaline phosphatase
- total acid phosphatase
- prostatic acid phosphatase
- LDH
- amylase
- CPK
- total protein
- serum calcium
- serum iron
- sodium
- potassium
- apolipoprotien A1
- apolipoprotein B

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Electrophoretic proteinogram
albumin
alpha-1 globulin
alpha-2 globulin
beta globulin
gamma globulin
albumin/globulins
lgG
lgA
lgM

- Coagulation: prothrombin time
- Faecal analysis occult blood in stool
- Urine physico-chemical analysis
  sedimentation
- Pregnancy test

3.3 COMPLEMENTARY SUBPROFILES

Starting from the profile described above, the complementary subprofiles provide the information needed to give a continuous evaluation of the state of the health of the population being studied.

The wide variability in the health of individuals and the diversity of the factors which influence the state of health affect the diversity of the specific examinations used and the complementary tests needed for an adequate appraisal of each case. For this reason, and in every case where medically indicated, additional examinations are included in the medical procedure, among which we cite:

- Radiographic studies
- Ultrasound tests
- Specialized tests (ophthalmologic, endocrinologic, gynecologic, etc.)

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3.4 EVALUATION OF THE MEDICAL DIAGNOSES

The medical diagnostics already described result in the evaluation, from the medical point of view, of the health of the individual. For this, the doctor counts on the information provided by the combination of the clinical history and the results of the different complementary tests. In those cases in which the relevant profile requires specialized tests or where this is requested voluntarily, the results of the said study are included also in the final evaluation of the diagnosis.

Taking all this into consideration, a MEDICAL EVALUATION is produced, which includes the results of the clinical examination and the complementary tests, the clinical judgement, and the relevant medical recommendations.

4. TECHNICAL RESOURCES

4.1. FACILITIES

The Medical Service has available a number of facilities which occupy apporximatly 600 sq.m., arranged as will be shown below:

- Diagnostic Reception area - This includes the following:

  reception
  waiting room
  audiometry and vision testing room
  extraction room
  radiology room
  electrocardiology room
  respirometry room
  diagnostic room
  ultrasound room

- Laboratory area

  clinical analysis lab
  biological dosimetry lab

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- Medical Aid area
  rehabilitation and electrotherapy room
  consulting nurse
  emergency room
  recovery room
  room for care of irradiated and contaminated persons
  medical consulting room

- Administrtive area
  secretaries
  medical materials storeroom
  records

4.2 TECHNICAL EQUIPMENT

4.2.1. DIAGNOSTIC EQUIPMENT

-SIEMENS RADIOLOGICAL EQUIPMENT, consisting of:

Polymat 100 multipulse x-ray generator. microprocessor controlled, and equipped with an Iontomat M automatic exposure meter for the 3-field x-ray camera system

Optilux 150/40/73C-100L emission tube with a spiral CALOREX anode of rhenium-graphite alloy

Multix CP table with catapult anti-diffusion and a lead 12/40 [12:40 ?]grating.

Bucky "ES" wide-view equipment. Spiral, equipped with an anti-diffusor and a 12:1 lead grating.

- PHILIPS ORION ULTRASOUND. Real time, linear and sectorial views with high resolution. Equipped with sectorial and trapezoidal transducers with variable focus and a high resolution graphic screen.

-SIEMENS SICARD P ELECTROCARDIOGRAM - Portable, multi channel, battery power supply, with simultaneous capability for 12 readings and the continuous study of heart rhythm via a selected channel. Traces produced in real time, on a liquid crystal screen, and in deferred time on paper, using a SICARD D printer. Memory to store 20 recordings and output connector for computer link.

- KELLIGE MULTISCRIPTOR EK26 ELECTROCARDIOGRAM. Three channel, with modules for phono- and mechano-cardiograms.

-MICRO S2 RESPIROMETER Computerized in an open system, for the analysis of volumes, capacities and for drawing fluid volume curves

- HORTMANN DA323 AUDIOMETER With two channels, for sound transmitted by air and by bone, with extensive sound insulation, sinusoidal testing signal, with the ability to test frequencies of 0.25, 0.5, 1, 2, 3, 4, 6, and 8 kHz and a minimum volume of 10 dB, with variations in steps of 5 dB.

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- ESSILOR VISIOTEST VISUAL FUNCTION ANALYZER For the analysis of ametropia, stereoscopic vision, muscular balance and chromatic vision. Equipped with CAMPITEST, a perimetric device for the measurement of the horizontal field of view, and of a DE WECKER OPTOTYPE for adults.

- SECA 708 DIGITRONIC CLINICAL SCALES Microprocessor controlled, with a range of measurement from 100 g to 200 kg. Equipped with a manual height and girth measurer.

- REISTER DE BAYONETA OTOSCOPIC AND OPHTHALMOSCOPIC EQUIPMENT Equipped with a varifocal ophthalmoscope with continuous focus, for varying lighting intensities at distances anywhere between zero and infinity.

4.2.2. LABORATORY EQUIPMENT

-COULTER COUNTER S-PLUS JR. DIFFERENTIAL BLOOD ANALYZER Consisting of four elements: compressor, diluter, analyzer and data terminal and printer. Storage for results from a minimum of 37 samples (including histograms), or a maximum of 307 samples (without histograms). Measurements made on the principle of cell counts based on detection and measurement of variations in the electrical resistance induced by the passage of particles suspended in a conducting solution, flowing through a small aperture at a

constant potential difference. These changes in resistance are proportional to the volume of the particles (principle of electric impedence). The method of hemoglobicianura is used to determine the concentration of hemoglobin, measuring the spectographic absorption at 500 nm.

The parameters relevant to a total citrated blood sample [no quantity given] are given in Table 2.

TABLE 2. HEMATOLOGICAL READINGS /14

MEASUREMENT	UNITS	SCALE	PRECISION
Hemate	million/µl	0-7	<2.0%
Hemoglobin	g/dl	0-25	<1.0%
Hematocrit	%	-	-
VCM	fl	50-200	<2.0%
HCM14 a	pg	-	-
CHCM	g/dl	-	-
Leucocytes	thousand/µl	0-99.9	<2.0%
Platelets	thousand/µl	0-999	<4.0%
VPM	fl	5-20	<2.2%

Amplitude of hemate distribution
Histogram of red-cell distribution
Histogram of white-cell distribution
Histogram of platelet distribution

- GENESIS 21 AUTOMATIC BIOCHEMISTRY ANALYZER - Multichannel, selective, equipped with 18 spectographic channels and 3 additional channels for selected ion measuring electrodes. Simultaneous measurement of up to 21 biochemical parameters.

The analytic techniques which are employed are detailed in Table 3.

TABLE 3. BIOCHEMICAL MEASUREMENTS

MEASUREMENT	REACTION	SAMPLE	ABSORPTION (mm)	UNITS	RANGE
GLUCOSE	enzymatic-colorimetric	serum plasma	492-550	mg/dl	10-560
UREA	enzymatic	serum plasma	340	mg/dl	0-300
CREATININE	kinetic-colorimetric	serum	404	mg/dl	0-6
TOTAL CHOLESTEROL	terminal point	serum	500	mg/dl	0-500
HDL-CHLLESTEROL	centrifuge-precipitation-terminal	serum	500	mg/dl	-
TRIGLYCERIDES	enzymatic-colorimetric	serum	458	mg/dl	0-1000
URIC ACID	terminal colorimetric	serum	520	mg/dl	0-18
GOT	UV kinetic	serum	340	Ul/l	0-442
GPT	UV kinetic	serum	340	Ul/l	0-442
GGT	kinetic-colorimetric	serum	405	Ul/l	0-400
TOTAL BILURUBIN	terminal colorimetric	serum	548	mg/dl	0-15
DIRECT BILURIBIN	colorimetric	serum	548	mg/dl	0-15
LDH	UV kinetic	serum	340	Ul/l	0-1000
ALKALINE PHOSPHATASE	kinetic-colorimetric	serum	404	Ul/l	0-800
TOTAL ACID PHOSPHATASE	kinetic-colorimetric	serum	404	Ul/l	0-35
PROSTATIC ACID PHOSPHATASE	kinetic-colorimetric	serum	404	Ul/l	0-35
AMYLASE	terminal point	serum plasma	450	Ul/l	-
TOTAL PROTEINS	colorimetric	serum	550	g/dl	0-15
SERUM CALCIUM	terminal colorimetric	serum	550	mg/dl	0-16
IRON	colorimetric	serum	628	µg/dl	0-1000

- UROTRON RL9 AUTOMATIC URINE SAMPLE ANLAYZER. Determination of the values of 9 parameters in urine samples using 11 channel reflective photometry.

The analytic techniques which are used are detailed in table 4.

TABLE 4. URINE MEASUREMENTS

MEASUREMENT	METHOD	ABSORBENCY	UNITS	RANGE
pH	methyl red blue bromotimol	634	-	5-9
GLUCOSE	glucose peroxidase	608	mg/dl	0-300
PROTEINS	protein error in pH	557	mg/dl	0-500
CETONIC BODIES	Legal's test	608	mg/dl	0-150
BILIRUBIN	diazoni-bilirubinic salt	557	mg/dl	0-12.0
UROBILIONOGENE	diazoni-urobil-inogenic salt	557	mg/dl	0-12.0
NITRATES	Griess test	557	+/-	-
LEUCOCYTES	esterase activity	557	/µl	0-500
ERYTHROCYTES	hemoglobin oxidation	665	/µl	0-250

- BOEHRINGER COATRON JUNIOR COAGULOMETER - Twin channel with infrared turbidometric reading. It measures the following:
  Prothrombin time: Calcium-thromboplastin method, 37°C
  Thromboplastin partial time : Cephalin-kaolin method at 37°C
  Fibrinogen: Clauss quantative method at 37°C

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ZEISS III BINOCULAR PHOTOMICROSCOPE - Integral 35 mm photographic camera, completely automatic and equipped with flat field lenses of 16/0.35, 40/0.65, 100/1.25 and a NEOFLUAR 63/1.25 flourescent lens.

NIKON LABOPHOT BINOCULAR MICROSCOPE Equipped with flat field color corrected lenses of 40/0.1, 10/0.25, 20/0.4, 40/0.65, 100/1.25.

- AIRFLUX H-200 TABLETOP LAMINAR FLOW CLEAN BOX Class 100 sterile work area (US federal standard 209a), sterile air exchange at rate of 1550 m^3/hr.

- BOEHRINGER REFLOTRON REACTIVE EXCHANGE PHOTOMETER Quantitative measurement using the technique of reflective photometry for biochemical analysis.

- LKB 2103 ELECTROPHORESIS POWER SUPPLY With continuous automatic control, from 10 to 2000 volts, with a stability of +- 2 V from 0 to 200 V and +- 1 V from 200 to 2000 V; current of 2 to 200 mA; power from 1 to 100 W, with a stability of +- 2% throughout the range.

- DIGISCAN ATOM 434 PHOTODENSITOMETER - Built in microprocessor for automatic calculation and printing on thermosensitive paper. Quantitative analysis of electrophoretic proteinograms and lipidograms on cellulose acetate supports.

- KONE MICROLYTE ION MODULE For the analysis using selected electrodes of Na, K and Ca in blood or serum and Na and K in urine. Capacity of 60 samples / hr.

- FISONS FI-STREEM FSL/4BD/C COUBLE DISTILLER Automatic production of 4 l / hr of double distilled water, free of pyrogens at a pH of 5.6 - 6.2.

- AUTESTER-DRY S-437-P AUTOCLAVE With a capacity of 28 l., maximum pressure 2 kg/cm^2 equivalent at 134° C.

- AREVALO AF-1000 STATIC ARMATURE REFRIGERATOR AND FREEZER Refrigeration between +5 and -2° C with a capacity of 750 l. Freezing at - 18° C with 250 l capacity.

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- SELECTA-206 CULTURE INCUBATOR - Capacity of 36 l and stability at 37° C for 90 min.

- SELECTA SERIES H STOVE - For dessication and sterilization, with 80 l capacity

-ORTHO DIGICEN CENTRIFUGE. With a speed selector, digital tachymeter, electric brake, capacity for 12 15 ml. tubes.

- ORTHO CLINO CENTREFUGE - With a speed selector, digital tachymeter electric brake and capacity for 16 15 ml tubes.

- SARTORIUS 2474 PRECISON BALANCE With mechanical weight changer; 160 gm weight increments; 0.1 g visual increments; 100 mg scale markings; projection scale steps of 1 mg and, for the micrometer, 0.01 mg, and accuracy of 0.01 mg.

- GIMA GIMETTE 3 DRY HEAT STERILIZER With thermostat, temperatures selectable up to 200 ° C and thermometer.

5. HUMAN RESOURCES

Currently the technical team taking part in medical monitoring of Palomares is composed of:

- 1 Head doctor of the Union of Workers' Health
- 1 Head doctor of the Medical Service
- 1 Head doctor of the Health Evaluation Service
- 1 Doctor specializing in Industrial Medicine
- 1 Doctor specializing in Clinical Analysis
- 5 Technical Health Assistants
- 3 Consultng doctors, specialists in ophthomalogy, gynecology and image diagnostics
- Auxilliary technical and administrative personnel.

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6. QUALITY CONTROL

The general process of evaluating the health of a population, from acquiring medical information up to its clinical evaluation, is subject to the general and specific criteria for guarantee and contol of quality which have been instituted throughout the Medical Service, and are meant to guarantee the homogeneity and uniformity of its proceedures as well as the reliability and reproducibility of its results.

The application of these standards of quality rests, on the one hand, on the protocolization of each and every point of methodology, and on the other on the use of specific quality control programs. For this reason the Laboratory of Clinical Analyses is a member of the Multidisciplinary Quality Control Program of the AEFA (Association of Analytic Pharmacists) and the AEBC (Spanish Association of Clinical Biopathology), which is officially recognized by the Minister of Health and Consumer Affairs.

7. MEDICAL REGISTRATION DOCUMENTS

In the next pages are examples of the documents which provide the physical means of organizing the medical information generated during medical monitoring.

MINISTRY OF
INDUSTRY, TRADE
AND TOURISM

Center for
the Investigation of
Questions Involving
Energy, Environment
and Technology

MEDICAL
SERVICE

CLINICAL AND WORK HISTORY

File No: _____

Admission No: _____

Date: _____

First Name: _____

Middle Name: _____

Surname: _____ I.D.No.: _____ S.S.No.: _____

Birthdate: _____

Birthplace: _____

Sex: _____ Blood Group and Rh Factor: _____

Entry Date: _____ Departure Date: _____

Reason for Departure: _____

_____

Remarks:

FAMILY HISTORY

RELATIONSHIP	CODE	ILLNESS AND/OR CAUSE OF DEATH	AGE

PERSONAL HISTORY

CODE	ILLNESS / ACCIDENT / OPERATIONS	AGE

ALLERGIES

CODE	ALLERGY	CONFIRMATION

IMMUNIZATIONS

VACCINE	1ST DOSE	2ND DOSE	3RD DOSE	4TH DOSE	5TH DOSE	6TH DOSE

RECORD OF EXAMINATIONS

Date	Type (1)	Fitness and Remarks

Date	Type (1)	Fitness and Remarks

(1) TIPO
1: Starting a job
2: Ordinary, periodic
3: Special, periodic
4: Return to work
5: Job terminated
6: After employment
7: Change of workplace
8: Requested by personnel office
9: Requeted by worker
10: On advice of medical service

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MINISTRY OF
INDUSTRY, TRADE
AND TOURISM

Center for
the Investigation of
Questions Involving
Energy, Environment
and Technology

MEDIC
SERVI

FORENAMES AND SURNAME	CASE NO.

WORK HISTORY

1. Occupations and occupational hazards

DATE	OCCUPATION	HAZARDS	TOTAL TIME THERE

MINISTRY OF INDUSTRY, TRADE AND TOURISM

Center for the Investigation of Questions Involving Energy, Environment and Technology

MEDICAL SERVICE

WORKPLACE IDENTIFICATION SLIP

FILLED OUT BY: PERSONNEL DIRECTOR ☐ TECHNICAL SECRETARY ☐

Surname and Forenames: _____

I.D. No.: _____

PROFESSION/TRADE

Profession: _____ Grade: _____

Branch/Address: _____ Organic C.: _____

Program/Area of Work: _____

Building: _____ Plant: _____ Work Group: _____ Phone #: _____

OUTSIDE WORK FORCE

Grade: _____ Profession/Trade: _____

Company: _____

Address: _____

_____ Phone #: _____

Department: _____ Section: _____

Date: ____/____/____ Signed: _____

FILLED OUT BY THE SECRETARY OF SAFETY AND HEALTH: CIEMAT ☐ OTHER ☐

DESCRIPTION OF DUTIES: _____

Date: ____/____/____ Signed: _____

WORKING CONDITIONS		
ENVIRONMENT	RADIATION	IONIZING
		NON IONIZING
	WORKING ATMOSPHERE	DUST
		MIST
		SOILS
		GASES/VAPORS
		BIOLOGICAL CONTAMINANTS
WORKING SURROUNDINGS	NOISE	
	VIBRATION	
	LIGHTING	
	TEMPERATURE, HUMIDITY	
	VENTILATION	
	FLOOR AREA	
	VOLUME	
	NEATNESS, CLEANLINESS	
	SANITARY FACILITIES	
SAFETY	EQUIPMENT/MACHINERY	
	FIRE PROTECTION	
	PERSONAL PROTECTIVE EQUIPMENT	
PHYSICAL DEMANDS	WORKING POSITION	
	PHYSICAL ACTIVITY	
MENTAL DEMANDS	ATTENTION	
	COMPLEXITY/BREED	
	DELICATENESS	
PSYCHO/SOCIO-LOGICAL FACTORS	INITIATIVE	
	STATUS	
	OPPORTUNITY FOR COMMUNICATION	
	RELATIONS WITH BOSSES	
	WORK SCHEDULE	

TO BE FILLED IN BY THE EMPLOYER'S SAFETY AND HEALTH SERVICE

TITLE: _____

_____

_____

_____

2. Work History (including unemployment)

DATE	OCCUPATION	HAZARDS	TOTAL TIME THERE

Other simultaneous employment: _____

_____

MINISTRY OF INDUSTRY, TRADE AND TOURISM

Center for the Investigation of Questions Involving Energy, Environment and Technology

MEDICAL SERVICE

FORENAMES AND SURNAME	CASE NO.

IDENTIFICATION AND INSTITUTIONAL DATA

Birthdate:_____

Birthplace:_____

Home Address:_____

City:_____ Province:_____

Postal Code:_____ Phone #:_____

Sex:_____ Married:_____ No. of children: _____ No. of Siblings:_____

Military Service:_____ Reason for Exemption:_____

Medical Region:_____ S.S. No.:_____

Head Doctor:_____

Health Center:_____ Hospital:_____

Blood Group:_____ Rh Factor:_____ Donor: Yes ☐ No ☐

Date Started Job:_____ Date Left Job:_____

Reason for leaving:_____

Date of Dismissal:_____ Reason:_____

MINISTRY OF INDUSTRY, TRADE AND TOURISM

Center for the Investigation of Questions Involving Energy, Environment and Technology

MEDICAL SERVICE

WORKER IDENTIFICATION SHEET

Surname and Forenames:_____

I.D. No.:_____

Birthdate: _____/_____/_____

Birthplace: _____/_____/_____

Home Address:_____

City:_____ Province:_____

Post Code:_____ Phone No.: (_____)_____

Sex:_____(1) Married:_____(2) Number of Children:_____/_____

Schooling:_____(3)

Admission:_____ S.S. No.:_____/_____

Date of Employment:_____/_____/_____

Date Left Job:_____/_____/_____ Reason:_____(4)

Date of Dismissal:_____/_____/_____ Reason:_____

Madrid, _____ the _____, 199__

Signed:----------

INSTRUCTIONS FOR FILLING IN FORMS

To be filled in by Personnel Director, for CIEMAT employees, and by the equivalent department for outside workers.

(1) Men (H) Women (M)

(2) Single (S) Married (C) Widow(er) (V) Divorced (D) Separated (SE)

(3) Level of Education:

- No higher schooling
- High school graduate
- Bachelor's degree
- Master's degree
- Higher degree

(4) Reason:

- Mandatory Retirement
- Voluntary Retirement
- Voluntary departure
- Other departure
- Military or equivalent service
- Transferred to another organization
- Contract finished
- Departure by request
- Dismissed
- Others (specify)

MINISTRY OF
INDUSTRY, TRADE
AND TOURISM

Center for
the Investigation of
Questions Involving
Energy, Environment
and Technology

MEDICAL
SERVICE

SURNAME AND FORENAMES	CASE NO.

RECORD OF VISITS

DATE	REASON, DIAGNOSIS, TREATMENT	DOCTOR

DATE	REASON, DIAGNOSIS, TREATMENT	DOCTOR

DATE	REASON, DIAGNOSIS, TREATMENT	DOCTOR

DATE	REASON, DIAGNOSIS, TREATMENT	DOCTOR

MINISTRY OF INDUSTRY, TRADE AND TOURISM

Center for the Investigation of Questions Involving Energy, Environment and Technology

MEDICAL SERVICE

APPOINTMENT FOR MEDICAL EXAMINATION

We are going to give you a medical examination, as is explained in the accompanying information leaflet.
Please present this form to the CIEMAT Medical Service (Building 7) at_____o'clock on the_____of_____199__

Cheif of Medical Service
(by):

Mr/Mrs/Miss

Madrid, on the of 199_
If you are unable to come on the date above, please contact us immediately by telephone, at 346 62 41

Type of examination:
Starting work
Ordinary, periodic
Special, periodic
Return to work
Quitting work
After having worked
Moving town
At the request of employer
At the request of family
On the advice of the Medical Service

_____
Name and Forenames

_____
I.D. No.

_____
Institution or Address Organic C.

_____
Program/Type of Work

_____
Building Plant Company Phone No.

_____
Outside work force ( ) Business

P.E. a R.I.: Yes ( ) No ( )

MINISTRY OF
INDUSTRY, TRADE
AND TOURISM

Center for
the Investigation of
Questions Involving
Energy, Environment
and Technology

MEDICAL
SERVICE

MEDICAL QUESTIONAIRE FOR EXAMINATION AT START OF EMPLOYMENT

Read this questionaire carefully
Filling it out provides valuable help in guiding your examination. Mark the answer Yes or No with an "x", whichever is more appropriate, and give the clearest possible replies to the other questions.
Take care to answer accurately, and if you are uncertain, please discuss the question directly with the doctor.
Any information you provide is absolutely confidential, and its use is restricted by the Medical Oath of Confidentiality.

We thank you for your cooperation.

IDENTIFICATION:

surname

forenames

identity number

birth date

WORK HISTORY

If you have worked before now, please fill out the following table, listing in chronological order your jobs, the period worked, and risks involved that you are aware you have been exposed to (noise, dust, radiation, chemical or biological products, strong physical loads, etc)

JOB	PERIOD WORKED	RISKS

- Were you ever involved in an accident at work? Explain

- Have you ever suffered from any occupational illness? Explain

PERSONAL MEDICAL HISTORY

Have you ever been in hospital?
When, and for what reason?

Please mark 'yes' or 'no' with an 'x' if you have suffered from any of the following illnesses [sic]

	yes	no
Typhoid		
paratyphoid		
maltese fever		
salmonella		
other intestinal infections		
pulmonary tuberculosis		
other tuberculosis		
herpes		
hepatits		
swamp fever		
typhus		
syphilis		
hydatic cyst		
other infections		
cancer		
benign tumors		
goiter		
diabetes		
gout		
elevated cholesterol		
anemia		
depression		
mental illness		
migrane		
sciatica		
other nerve illnesses		
cereberal stroke		
spina bifida		
other diseases of the nervous system		
cataracts		
glaucoma		
detatched retina		
strabismus		
changes in vision		
otitis		
vertigo		
deafness		
sinusitis		
deviated septum		
chronic pharyngitis		
vocal chord polyps		
nasal allergies		
rheumatic fever		

	yes	no
mitral stenosis		
hypertension		
hypotension		
cardiac failure		
myocardial infarct		
angina pectoris		
arrythmia		
varices		
thrombophlebitis		
bronchitis		
pneumonia		
pleuritis		
bronchial asthma		
silicosis		
other respiratory illnesses		
oral ulcers		
dental infections		
changes in the digestion		
gastritis		
gastroduodenal ulcer		
alimentary hemmorage		
appendicitis		
perotonitis		
hernia		
irritable bowel		
haemorrhoids		
anal fissure or fistula		
hepatic cirrhosis		
bilary litiasis		
kidney failure		
cystitis		
other kidney diseases		
V.D.		
prostatitis		
orchitis		
sterility		
mammary cysts		
mastitis		
changes in menses		
menstrual pain		
vaginal infections		
abortions		
ectopic pregnancy		

	yes	no
sebaceous cyst		
eczema		
psoriasis		
hair loss		
other skin diseases		
joint disease		
inflamed joints		

	yes	no
herniated disk		
spinal dislocation		
fractures		
dislocations		
misalignment		
other bone diseases		

MINISTRY OF
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MEDICAL
SERVICE

If you have had any disease not on the list, you may initiate it below, along with any remarks you believe appropriate.

OBSERVATIONS:

Madrid _____, the _____, 199__

Signed: _____

MINISTRY OF INDUSTRY, TRADE AND TOURISM

Center for the Investigation of Questions Involving Energy, Environment and Technology

MEDICAL SERVICE

Surname and Forenames	Date	Case No.

Medical Examination

In-house worker ☐
Outside worker ☐

Type of Examination

At entry ☐
Periodic, ordinary ☐
Periodic, special ☐
Change of place ☐

Return to work ☐
End of employment ☐
After employment ☐

Requested by worker ☐
Requested by personnel department ☐
Requested by doctor ☐

Profile

Entry ☐ Specific risks _____

Man < 45 years
> 45 years

Woman < 45 years
> 45 years

Interview

Habits

Tobacco
Smoker ☐ Years smoking ☐ Cigarettes / day ☐
Non-smoker ☐ Years not smoking ☐ Cigars / day ☐

Alcohol
Never drank ☐ Has not drunk for (time): ☐
Drinks occasionally ☐ Regular weekend drinker ☐
Drinks daily ☐ Started drinking at (age): ☐

☐ c.c./day ☐ alcohol content ☐ grams of alcohol
☐ ☐ ☐ Daily total ☐
☐ ☐ ☐

Others (specify)
_____: a little ☐ moderately ☐ a good deal ☐
_____: ☐ ☐ ☐
_____: ☐ ☐ ☐

Diet
Eats anything ☐ Can't eat: _____
Special diet-specify: _____

Coffee or tea <2 cups ☐ 2-5 cups ☐ >6 cups ☐

Medications: _____

Psychotropic drugs: _____

Sport: Does not exercise ☐ Regularly exercises ☐ Exercises a lot ☐

Summary: _____

EXAMINATION

1. Measurements

Actual Weight	Height	Ideal Weight	% Over weight	Strength			
				Right Hand	Left Hand	Back	Shoulders

Body Type: Median ☐ Athletic ☐ Thin ☐ Asthenic ☐

Observations _____

CIEMAT - MEDICAL SERVICE

Forename and Surname	Case No.

IMMUNOLOGICAL ANALYSIS

	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE
lgG lgA lgM									
VIH VIH Confirm.									
HBs Ag Anti HBs Ag Anti HBc Ag Pregnancy test									
PCR FR ASLO									
VDRL Sera:equinoc-cocus Sera:brucel-losis Sera:rubeolz Sera: S.typhosz Sera:S. para-typhosa R.Mantoux									

Skin-Marks

	Yes	No		Yes	No		Yes	No
Color change:	☐	☐	Pruritis	☐	☐	Glandular swelling:		
Spots:	☐	☐	Eczemas:	☐	☐	Axillary	☐	☐
Scars	☐	☐	Warts:	☐	☐	Superclavicular/neck:	☐	☐
						Ingeinal:	☐	☐
						Submaxillary:	☐	☐

Summary: _____

3. Cardiovascular-Respiratory

F.C.:	T.A.:	T.A.E.:	Oscillometry	Right / /
				Left / /

	Yes	No
Cough	☐	☐
Spitting	☐	☐
Spitting blood	☐	☐
Difficulty breathing	☐	☐
Cyanosis	☐	☐
Chest pains	☐	☐
Palpitations	☐	☐
Gyncopies	☐	☐
Edemas	☐	☐
Varicies	☐	☐

	Nrml	Abnml
Upper Vasosystem:	☐	☐
Cardiac artery:	☐	☐
Pulmonary artery:	☐	☐
Carotid artery	☐	☐
Abdominal artery	☐	☐

	Nrml	Abnml
Radial pulse:	☐	☐
Posterior tibial pulse	☐	☐
Pedial pulse	☐	☐
Carotid pulse	☐	☐
Femoral pulse	☐	☐

E.C.G.: _____

Espirometry: _____

RX Thorax: _____

Summary: _____

4. Digestion

Dentation: Nrml: ☐ Missing Teeth: ☐ Partial Plate: ☐ Full Plate: ☐

	Nrml	Abnml		Yes	No
Tongue:	☐	☐	Abdominal pain:	☐	☐
Swalling:	☐	☐	Hemmorrhoids:	☐	☐
Digestion:	☐	☐	Hernia:	☐	☐
Evecuation:	☐	☐	Fistulas:	☐	☐
Abdominal palpation:	☐	☐	Ichtericia:	☐	☐
Liver palpation:	☐	☐	Bleeding:	☐	☐
Lower Abdom. palpation:	☐	☐	Hair:	☐	☐

Summary: _____

5. Nephrology

	Yes	No		Yes	No
Backache:	☐	☐	Night urination:	☐	☐
Bloody urine:	☐	☐	Oliguria:	☐	☐
Dysuria:	☐	☐	Polyuria:	☐	☐
Retention:	☐	☐	Frequent urination:	☐	☐

Renal percussion: Normal ☐ Painful ☐

Summary: _____

6. Genitalia:

	Nrml	Abnml		Yes	No		Yes	No
Male ♂	☐	☐	Dysmenorrhea:	☐	☐	Menstrual cramps:	☐	☐
Female ♀	☐	☐	Leucorrhea:	☐	☐	Bleeding:	☐	☐
Breasts	☐	☐	Pruritis:	☐	☐	Pregnancy:	☐	☐

Contraceptives: Hormonal ☐ Mechanical ☐ Chemical ☐ Surgical ☐ IUD ☐ Other ☐

Age of Menarche	Menstrual Cycle	Age at Climacteric	Year of Last Period	Pregnancies	Abortions	Live births

Summary: _____

7. Locomotion:

	Nrml	Abnml		Nrml	Abnml
E.E.S.S.Inspection:	☐	☐	E.E.S.S. Mobility:	☐	☐
E.E.I.I.Inspection:	☐	☐	E.E.I.I. Mobility:	☐	☐
Hands Inspection:	☐	☐	Hands Mobility:	☐	☐
Spinal Col.Inspection:	☐	☐	Walking/Coordination:	☐	☐

Foot at rest:

Summary: _____

8. Nervous System:

	Nrml	Abnml		Yes	No
Evenness of skull:	☐	☐	Head:	☐	☐
Skeletal reflexes:	☐	☐	Dizziness:	☐	☐
Skin reflexes:	☐	☐	Shaking:	☐	☐
Romberg:	☐	☐	Paresthesia:	☐	☐
Nose-finger test:	☐	☐	Poor tone:	☐	☐
Sensitivity:	☐	☐	Memory changes:	☐	☐

Summary: _____

9. Vision:

	Yes	No		Yes	No		Nrml	Abnml
Floaters:	☐	☐	Double vision:	☐	☐	Eye exam:	☐	☐
Nystagmus:	☐	☐	Astigmatizm:	☐	☐	Lids:	☐	☐
Epitore:	☐	☐	Myopia:	☐	☐	Conjunctiva:	☐	☐
Itching:	☐	☐	Farsighted:	☐	☐	Pupils:	☐	☐
Cateracts:	☐	☐	Presbyopia:	☐	☐	Mobility:	☐	☐
H.T.O.:	☐	☐	Optical corr.:	☐	☐	Color Vision:	☐	☐

Glasses ☐ Contact Lenses ☐ Date of last examination ____/____/____

Summary: _____

10. Otorhynology:

	Normal	Abnormal		Normal	Abnormal
Ears:	☐	☐	Ear ache:	☐	☐
Nose:	☐	☐	Pitch:	☐	☐
Throat:	☐	☐	Poor hearing:	☐	☐
Smell:	☐	☐	Bad speech:	☐	☐
Audiometry	☐	☐	Deviated septum:	☐	☐

? :_____ Weber:_____

Summary:_____

11. Endocrine System:

	Yes	No		Normal	Abnormal
Diabetes:	☐	☐	Thyroid:	☐	☐
Obesity:	☐	☐	Sweating:	☐	☐
Weight loss:	☐	☐	Skeletal conformation:	☐	☐
Hirsuitness:	☐	☐	Distribution of body hair:	☐	☐

Summary:_____

12. Psychopathology:

General impression: Good ☐ Unfavorable ☐ Coopertiveness: Good ☐ Poor ☐

Speech and Pronunciation: Correct ☐ Abnormal ☐ Changes in sleeping habits: yes ☐ no ☐

Psychological tests:

Summary:_____

Clinical judgement:_____

Medical fitness for work:_____

Examining Doctor:_____

CIEMAT - Medical Service

Forenames and Surname	Case Number

Blood Analysis

Blood Group Rh	Date	Date	Date	Date	Date	Date	Date	Date	Date
hemate									
hemoglobin									
hematocrit									
VCM									
HCM									
CHCM									
RDW									
leucocytes									
platelets									
VPM									
reticulocytes									
lymphocytes %									
crooked %									
segmented %									
esinophils %									
basophils %									
monocytes %									
%									
%									
%									
lymphocytes									
crooked									
segmented									
esinophils									
basophils									
monocytes									

(illeg ible)	red series									
	white series									
	platelets									
(illegible)	coagulation time									
	bleeding time									
	prothrombin time									
	thrombin time									
	fibrinogen									
	clot refraction									
	capillary fragility									
RG first hour										
Rg second hour										
Katz test										
REMARKS										

CIEMAT - Medical Service

Forenames and Surname	Case Number

BIOCHEMICAL ANALYSIS

	Date	Date	Date	Date	Date	Date	Date	Date	Date
glucose									
urea									
creatinine									
uric acid									
total cholesterol									
HDL cholesterol									
LDL cholesterol									
triglycerides									
total lipids									
GOT									
GPT									
GGT%									
total bilirubin									
direct bilirubin									
indirect bilirubin									
alkaline phosphatase									
total acid phosphatase									
prostatic acid phosphatase									
CPK									
LDH									
amylase									
serum calcium									
serum iron									
total proteins									
sodium									
potassium									
chlorine									
ionic calcium									

phosphorus										
metahemoglobin										
PROTEINOGRAM	albumine									
	α_1 globulin									
	α_2 globulin									
	β globulin									
	albuminoglobulin									
REMARKS										

CIEMAT - Medical Service

Forenames and Surname	Case Number

Urinalysis

	Date	Date	Date	Date	Date	Date	Date	Date	Date
density									
pH									
glucose									
proteins									
cetonic cells									
bilirubin									
urobilinogen									
nitrates									
leucocytes									
erythrocytes									
leucocytes									
hemate									
cells									
crystals									
(illegible)									
precipitates									
hyaline mucus									
others									
stones									
urine culture									

antibody analysis									
REMARKS									

Feces Analysis

SOH	sample 1									
	sample 2									
	sample 3									
parasitilogy										
mycology										
bacteriology										
REMARKS										