

Position Classification Standard for Medical Instrument Technician, GS-0649

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SERIES DEFINITION

This series includes positions that perform diagnostic examinations or medical treatment procedures as part of the diagnostic or treatment plan for patients. The work involves operating or monitoring diagnostic and therapeutic medical instruments and equipment associated with cardiac catheterization, pulmonary examinations and evaluations, heart bypass surgery, electrocardiography, electroencephalography, hemodialysis, and ultrasonography. Positions in this series require a knowledge of the capabilities and operating characteristics of one or more kinds of instruments and a practical knowledge of human anatomy and physiology. Positions also require a practical understanding of medical data generated by patient/equipment connections. Some positions also require a practical knowledge of chemistry, pharmacology, physics, and mathematics.

NOTE: This standard supersedes the Medical Machine Technician Series, GS-0649 published in March 1973.

EXCLUSIONS

1. Classify positions that require professional skills and knowledges, in nursing, medical technology, biochemistry, or physiology or other professional areas in the appropriate professional series.
2. Classify positions that perform technical work using radionuclides for diagnostic, therapeutic, and investigative purposes under the direction of a physician in the [Nuclear Medicine Technician Series, GS-0642](#).
3. Classify positions that perform technical support work in a clinical laboratory (performing diagnostic laboratory tests of human blood, urine, and other body fluids) in the [Medical Technician Series, GS-0645](#).
4. Classify positions that perform technical work which involves operating radiologic medical equipment as part of the diagnostic plan for patients in the [Diagnostic Radiologic Technician Series, GS-0647](#).
5. Classify positions that perform technical work operating ionizing radiation equipment and sealed radiation sources for radiation therapy which is subordinate to the work of radiologists, or other professional personnel, in the [Therapeutic Radiologic Technologist Series, GS-0648](#).
6. Classify positions that perform technical work providing therapeutic and diagnostic respiratory care and life support to patients in the [Respiratory Therapist Series, GS-0651](#).

7. Classify positions that perform nonprofessional technical or support work in the field of health or medicine, when no other series is more appropriate, to the [Health Aid and Technician Series, GS-0640](#).

OCCUPATIONAL INFORMATION

Medical instrument technicians perform procedures and examinations on patients as a clinical or research service to physicians. The service relates to the treatment of particular patients or it involves providing the physician with technical information used in the diagnosis and treatment of diseases in patients. In the Federal service technicians work in various departments of hospitals, in operating rooms, at patient's bed, in clinics, or in research organizations using both stationary and mobile equipment. Physicians exercise control over medical instrument technician work.

Technician work follows this basic pattern: receive request for procedure or treatment; interpret physician's requests or instructions; secure confidence and cooperation of patient; position the patient; connect patient to the equipment; and set controls and operate the equipment to get test or treatment results. Physicians directly supervise some procedures (such as cardiac catheterization, exercise treadmill tests, and bronchoscopy). They clean and sterilize instruments and conduct routine maintenance and adjustment checks. Medical instrument technician assignments also include some responsibility for instructing other technicians, physicians, nurses and others in the use of the equipment. Technicians usually provide instruction on the job but they may conduct classroom instruction.

All medical instrument technicians must have knowledges and skills to operate the specific instrument and its accessory devices. At the lower grade levels, technicians must know the technical aspects of the instrument well enough to deliver the prescribed examination or treatment. They are responsible for routine and standard diagnostic or treatment procedures, patient instructions, and instrument cleaning and maintenance. At the higher grade levels, technicians must understand the technical aspects of the equipment used as well as the physiological reactions of the patient once the examination or treatment begins. They decide how to adapt the instrument to the patient based on information gained through previous experience, observation, and results. They have responsibility to provide diagnostic or treatment services to acutely ill patients. This requires that they adjust the instruments or select procedures based on patients' physical condition, respond to emergencies and sometimes make recommendations to physicians based on observation of patients' responses. The assignment of critical procedures to a technician is frequently dependent upon the hospital policies governing diagnostic and treatment services, the kind and level of training the technician has, and the physician's confidence in the technician's ability and skill to perform the work.

The technician applies a practical knowledge of the basic medical sciences such as human anatomy and physiology. The extent and depth of these knowledges increase in proportion to both the complexity of the techniques involved and the degree of responsibility the technician has to resolve problems not governed by specific guidelines. Some positions also require a basic

knowledge of pharmacology, chemistry, physics, and mathematics to make a few analyses or formulations.

Technician positions covered by this series require the ability to work as part of a team. Most positions demand a significant degree of personal responsibility and involve personal contacts with patients. This requires a sensitivity to patient condition and a capacity to establish rapport with sick people to gain their cooperation, set them at ease, and explain procedures. Technicians must recognize patients' lack of response or adverse reaction to treatment or examination procedures, and refer such problems to a physician or take other appropriate action.

The following is a list of instruments most commonly used by technicians in the Federal service. The instruments fall into three distinct groups.

Note: This list is not all inclusive.

I. Diagnostic Instruments and Equipment (and accessories)

A. Electrocardiograph (EKG) - an instrument used to measure and record electrical potentials generated during the contraction and relaxation of the heart. The equipment features (a) a 3-channel automatic recording capability which makes it possible to query 12 leads coming off the heart, three at a time; and (b) a dedicated computerized system that will automatically perform interpretations of the ECG data for the attending physician.

B. Exercise Tolerance Testing System - a system that measures and records electrical potentials generated during the contraction of the heart during increasing amounts of exercise.

C. Holter Monitoring Scanner - a portable instrument that records and measures electrical potentials generated by the heart on 24-48 hour tapes.

D. Electroencephalograph (EEG) - an instrument which, through electrodes attached to the skull, picks up low-level voltages and measures and records the rhythmically varying potentials produced by the brain.

E. Electromyograph - an instrument that measures and records electrical potentials generated by muscles.

F. Ultrasonic scanning devices including doppler equipment-instruments which visualize tissues and organs and present cross-sectional and two dimensional images for use by professional personnel in the diagnosis of diseases and study of organs. Some devices like the echocardiograph record the position and motion of the heart walls or the external structures of the heart and neighboring tissue by echo from beams of ultrasonic waves directed through the chest wall.

G. Pulmonary Function Apparatus - an instrument that measures rate and volume ventilation on respired gas content analysis.

H. Spirometer - a device that measures the rate and volume of inspiration and expiration.

I. Arterial Blood Gas Analyzer - a device that measures the various gas parameters and acid-base status of arterial blood samples.

J. Fluoroscopic Bi-plane x-ray equipment - instruments that produce a temporary two plane x-ray image on a fluoroscopic image intensification device.

K. Endoscopic instruments - instruments designed to examine the hollow organs of the body.

1. bronchoscope - an instrument designed to be passed through the nose or mouth to examine the bronchial tubes of the lung.

2. Catheters - a thin plastic tube placed through the blood vessel or artery of an arm or leg to the heart permitting coronary angiography and electrophysiologic studies.

II. Therapeutic Instruments

A. Endoscopic devices - instruments and equipment that use electrodes or a laser beam to treat bleeding sites, remove abnormal growths, dilate narrowed areas, and get samples for examination.

B. Dialyzer - an instrument used to remove undesirable molecules from the blood of chronic renal failure patients by passing blood through a semipermeable membrane into a dialyzing bath and then returning the blood to the body.

C. Intra-Aortic Balloon Pump - an instrument that aids the heart in maintaining blood flow (blood pressure).

III. Surgical Support Instrument

Heart-Lung Bypass Apparatus - this instrument is a combination blood pump and blood oxygenator used during coronary bypass surgery and respiratory failure. During operations, the machine takes over the functions of the heart and lungs. This machine regulates blood circulation and composition and oxygen and carbon dioxide levels, administers drugs, and controls body temperature.

SPECIALIZATIONS

Cardiac Catheterization positions perform, under a physician's direction, diagnostic tests, both invasive and noninvasive, of the pulmonary system (lung) and the cardiovascular system (heart and circulation). These positions operate, monitor and collect data from instruments used in procedures such as cardiac catheterization, angiography, valvoplasty, angioplasty, electrophysiologic studies, cardiac pacing, or cardiac pacemaker or leadwire insertion.

Instruments include: electrophysiologic recorders, radiographic contrast injectors, cardiac output computers, dye densitometers, oximeters, blood gas analyzers, the cinefluoroscopic system and angiographic catheters, catheter tip manometers, defibrillators and transducers.

Electrocardiograph (EKG) positions operate instruments used to record electrocardiograms, exercise tolerance tests, 24-48-hour heart monitoring and scanning, and pacemaker evaluations. Instruments include: electrocardiograph, Holter recorders and scanners, cardiopulmonary exercise system, phonocardiograph, cardiac defibrillator, emergency monitors, and other instruments and devices.

Electroencephalograph (EEG) positions operate the electroencephalograph and other devices, such as evoked potential equipment, to record the electrical activity of the brain. Tests performed include special sleep studies, visual, auditory, and somatosensory evoked potentials, hyperventilation, surgical EEG and evoked potential monitoring, and brain mapping. Some technicians may also work in electromyography laboratories involved in nerve conduction studies.

Perfusion positions operate the heart-lung apparatus to take over functions of patient's heart and lung during coronary bypass surgery, valve replacement or respiratory failure. The technician uses the pump oxygenator, coronary perfusion apparatus, auto-transfusion device, defibrillators, aortic balloon pump, flowmeters, pressure transducers, amplifiers, oscilloscopes, blood gas analyzers, and coagulation monitors.

Hemodialysis positions operate and monitor kidney dialysis instruments to provide dialysis treatment to patients with kidney failure or to maintain patients with chronic irreversible kidney disorders.

Pulmonary Function positions operate instruments to perform blood gas analysis; bronchoscopy with lung sampling; cardiopulmonary exercise stress tests; lung volume tests including spirometry (both pre and post medication); total lung capacity, functional residual capacity, and flow volume loops. Instruments include: arterial blood gas analyzers, spirometers, flowmeters, the body plethysmograph, electrocardiographs, cardiac pulmonary exercise system, and nebulizers.

Diagnostic Ultrasound positions operate diagnostic ultrasonic scanning equipment to produce cross sectional and two dimensional pictures of internal organs and body structures used to diagnose diseases and other medical conditions. These positions may also operate the echocardiograph.

NOTE: Inclusion of this occupation supersedes Exclusion 7 in the Diagnostic Radiologic Technician Series, GS-0647, which places ultrasound positions in the Health Aid and Technician Series, GS-0640.

TITLES

Medical Instrument Technician is the title for positions in this series. Set up titles to agree with the specialty designation in accordance with Section III H. of the [Introduction to the Position Classification Standards](#).

Medical Instrument Aid is the title for positions graded below GS-4. Specialized titles are not appropriate for these positions.

Supervisory Medical Instrument Technician is the title for positions which meet the criteria in the [General Schedule Supervisory Guide](#). (In Department of Defense components, use criteria for supervisory positions in other guides.)

GRADING OF POSITIONS

Evaluate positions on a factor by factor basis using factor level descriptions. Use only the point values of the Factor Evaluation System (FES). Use the [Primary Standard](#) and related FES standards to evaluate the factors of positions that significantly exceed the highest levels described in this standard. Complete instructions for factor levels, the concepts underlying each level, and for evaluating positions are in the [Introduction to the Position Classification Standards](#). Use the [General Schedule Supervisory Guide](#) to evaluate supervisory positions. (In Department of Defense components, use grading instructions contained in other guides.)

GRADE CONVERSION TABLE

Total points on all evaluation factors are converted to GS grade as follows:

GS Grade	Point Range
4	655-850
5	855-1100
6	1105-1350
7	1355-1600
8	1605-1850

FACTOR LEVEL DESCRIPTIONS

FACTOR 1, KNOWLEDGE REQUIRED BY THE POSITION

Level 1-3--350 points

Knowledge of the basic instruments and diagnostic or treatment procedures commonly used in the specialization. Ability to position patients for examination or treatment and knowledge of usual alternate positions for patients with common physical disabilities. Knowledge of basic medical terminology to interpret physician instructions. An elementary understanding of basic anatomy and physiology or chemistry and mathematics. Knowledge and skill in emergency first aid procedures such as cardiopulmonary resuscitation. Skill to apply such knowledges to perform routine diagnostic or treatment procedures or to assist as a team member during procedures. Knowledge of normal and abnormal results to recognize and report obvious abnormalities during procedures. Knowledge of sterilization methods to clean instruments to prevent the spread of infectious and contagious diseases.

Illustrations:

Performs routine pulmonary function tests in a hospital or clinic. Operates, calibrates and maintains commonly used instruments such as blood gas analyzers, oximeters, and gas nebulizers. Conducts standardized tests such as forced and slow vital capacity, blood gas analysis, and flow volume loops. Instructs patient when and how to perform breathing exercises. Calculates and measures blood gas values. Uses aseptic methods to draw blood samples from patients, and properly use and clean equipment.

Operates and monitors commonly used electrocardiographic equipment including 12-lead electrocardiogram and accessories. Instructs, positions and prepares patients; attaches electrodes to patients' chest and extremities to record prescribed heart tracing. Manipulates the controls and programs information into the electrocardiogram computer to provide tracing. Checks recording and highlights any abnormal tracing caused by external action or conditions. Monitors tracing before and after testing and alerts proper medical personnel of serious abnormal test results. Varies test procedures to adjust for patient medical condition.

Level 1-4--550 points

In addition to the knowledges and skills described at Level 1-3, a practical knowledge of instruments used in the specialization to make adaptations and adjustments and interpret test results based on previous experience and observation. This level requires a practical knowledge of intricate examination or treatment procedures. A basic knowledge of anatomy and physiology including location and function of the major body organs and structures as they relate to the specialization. Knowledge of the common diseases and their effects associated with the specialization. Skill to apply knowledge in adapting instruments to perform a full range of specialized tests or nonroutine diagnostic or treatment procedures requiring many steps, and

various approaches and procedures based on findings from the early steps. Knowledge of pharmacology and chemistry to understand drug action, effects, and method of administration. Ability to work as a member of a team when performing procedures that require making rapid and accurate observations or adjustments to established practices. Skill to prepare summary of test results, workload reports, and related documents.

Illustrations:

Aids cardiovascular surgeon in all aspects of cardiac catheterization and related invasive cardiovascular procedures such as coronary angioplasty, pulmonary angiography, and intra-aortic balloon insertion. Selects, sets up, and calibrates surgical instruments, catheters, radiographic contrast injectors, and radiographic imaging devices. Prepares cardiac medication for administration by the physician during emergency procedures. Recognizes cardiac arrhythmias, including atrial fibrillation, atrial flutter, and ventricular premature beats and takes appropriate action. Sets up and operates many monitoring and recording devices.

Operates and monitors dialysis system for chronic patients. Checks patient condition and determines proper treatment procedure, technique, and machine adjustments. Understands medical treatment of patients with renal failure. Administers prescribed medication and watches for desired action or adverse reaction. Recognizes and reacts to signs and symptoms (for examples, vomiting, fainting, nausea, and headaches) that signal the onset of complications of dialysis including hypotension, disequilibrium, seizures and arrhythmias. Instructs home dialysis patients.

Operates and monitors EEG and evoked potential equipment. Performs a full range of electroencephalographic examinations including special activation studies such as hyperventilation, light stimulation, and eye monitoring. Performs other special tests requiring fine discriminations and precise identification of artifacts, such as recording eye movements to identify rapid eye movement sleep and recording tremors from various parts of the body. Adjusts and assembles various electrodes for special situations.

Performs a variety of ultrasound examinations according to physician instructions that require an indepth knowledge of specific organs. For examples, identifies tumors on organs. Explains the ultrasound process to patient. Positions the patient as needed for the best test results. Sets up and adjusts the ultrasound equipment to meet the condition of the examination and the patient. Moves transducer, adjusts depths and types of scan to produce image. Adjusts and adapts equipment and procedures to accommodate patient handicaps, to improve reliability of results, or to conduct nonroutine tests. Performs operator preventive maintenance and care of equipment. Assists higher graded technicians in performing more complicated examinations. Records doppler velocities and gradients.

Operates and monitors electrocardiographic equipment to perform specialized examinations and studies involving exercise stress testing, ambulatory monitoring of arrhythmias, and indirect carotid pulse tracings on chronic patients. Monitors tracings to identify arrhythmias and when gross abnormalities appear, when to repeat certain procedures, when to stop test procedure, and when to get the immediate attention of a physician. Evaluates test results to

determine appropriate machine adjustments. Uses alternative techniques and procedures when established procedures do not accomplish acceptable results. Adapts equipment and accessories to yield the best results during the examination. Edits and selects appropriate sample portion of tracing for further interpretation by physician.

Operates the heart-lung apparatus during coronary by-pass surgery. Assembles and prepares supplies and equipment changing and adapting as appropriate to accommodate the size and physical condition of the patient or any technical surgical problems. Starts and maintains circulation and ventilatory support of patient during surgical procedures monitoring vital functions to maintain blood volume in patient, reservoir, and pump. Maintains safeguards and recognizes when changes in equipment or procedures might result in increased risk, and adapts methods to prevent such risk. Watches the equipment for proper operation, changes standard procedures to accommodate new equipment, and determines when equipment needs maintenance or repair. Follows and maintains rigid surgical sterility techniques during procedures.

Level 1-5-- 750 points

Knowledge and skill as described at Level 1-4 and, in addition, knowledge of the instruments and complex procedures of the specialization to perform special complicated examinations or treatments for which there are no standard instructions and procedures. Knowledge of anatomy and physiology including an indepth understanding of the functioning of the major systems and internal organs to interpret requests and to recognize the need for additional tests or a different position. Knowledge of a variety of related acute disorders and diseases, their effects on the organs, and methods of treatment. Knowledge of pharmacology including the classification and administration of drugs, patient responses, and common dosages. Skill to apply such knowledges to perform relatively new diagnostic or treatment procedures involving very fine distinctions or many delicate and exacting steps, the instruments are complex and the setting and measurements are fine. Skill to change and adapt parts of the instrument to meet especially difficult situations. Knowledge of and skill to start emergency cardiac arrest procedures and monitor vital signs during examinations. Skill to prepare and analyze quality control of test results.

Illustrations:

- Performs diagnostic ultrasound examinations and echocardiographs. Locates and records internal elements of the body (for example, organs, tissues, skeletal members), displays their position and function, and identifies any anomalies indicative of disease, injury, or other medically significant condition, from ultrasound imaging and simultaneous recordings of the doppler. Incorporates the causes and results of a variety of symptoms and conditions into a plan of ultrasonic diagnostic examination. Changes and develops sounding techniques to accommodate such variables as limited patient mobility, variation in physical condition or dimension of patient, presence of prosthesis or foreign objects and ultrasonic response of different body parts. Produces diagnostic quality images and doppler frequency shift recordings using the M-mode, two-dimensional and doppler ultrasound.

- Assists in coronary by-pass surgery, valve replacements of various types, or heart transplantation operating the heart-lung apparatus. Assembles supplies and equipment and prepares to accept patient on extracorporeal circulation in case of premature cardiac arrest or failure. Provides and maintains blood volume in patient to prevent shock or air embolus. During heart transplantation, monitors both donor and recipient hearts. Searches for new methods for a safer and better system of perfusion.

or

- Researches and tests methods which are adaptable for patients on special research drugs or patients with coagulation problems. Prepares written procedures and instructions for using new equipment and for adapting this equipment to individual surgical requirements.
- Performs complicated pulmonary function examinations such as ventilation studies. Reruns tests which do not produce acceptable or predictable results and extends measurements. Conducts tests in intensive care units. Performs bronchial provocation testing watching for signs of distress which could lead to cardiopulmonary arrest. Assists physician with testing of sedated patients, and with ECG and oximetry monitoring for patient safety during procedures. May aid physician with performance of fiberoptic bronchoscopy, laser/radiation procedures, fine needle aspirations, bronchial brushing, and biopsy. Assists medical personnel in planning and devising alternate and new pulmonary testing, upgrading present procedures, and developing new procedures. Evaluates the technical capability and potential for clinical application of new equipment and prepares written procedures and operating instructions. Instructs other technicians, students, and physicians in training in pulmonary laboratory techniques.
- Serves as a member of a dialysis team performing dialysis on acutely ill patients. Responsible for patients within an intensive care setting. Performs dialysis procedure without supervision and must act on own experience and judgment in performing both peritoneal and hemodialysis procedures. Evaluates the patient's condition and determines the proper treatment procedure, technique, and compatible instrument adjustments. May participate in percutaneous renal biopsies, watching the patient during the procedure and properly processing the specimen. Assists physician during peritoneal catheter insertions and observes patient for vital signs and provides post operative care. Provides instruction and monitors patients for home dialysis. Performs training of physicians, nurses, and technicians on hemodialysis and peritoneal dialysis techniques.

FACTOR 2, SUPERVISORY CONTROLS

Level 2-1--25 points

The supervisor makes assignments that limit the complexity and variety of procedures and techniques. The supervisor provides clear, specific, and detailed instructions on each procedure.

The technician performs work as instructed and consults with supervisor on problems not specifically covered by instructions.

The supervisor reviews the work in progress and upon completion for accuracy, adequacy, and adherence to instructions and regular procedures.

Level 2-2--125 points

The supervisor makes continuing assignments that show what is to be done, possible problems, quality and quantity of work expected, and priority of assignments. The supervisor provides additional instructions or guidance on procedures for new and difficult assignments.

The technician independently carries out recurring examinations or treatments without instructions but refers deviations from regular procedures, unanticipated problems, and unfamiliar situations not covered by instructions to supervisor for decision or help. Subject to preset decision criteria the technician uses judgment and initiative in selecting procedures, observing if instruments are functioning properly, and choosing the best test results.

The supervisor checks the work on a spot-check basis to assure that finished work and procedures are technically accurate and in compliance with usual procedures and practices.

Level 2-3--275 points

The supervisor defines goals, priorities and deadlines of the work. When working as a member of a team, physicians accept the technician's knowledge of complex procedures. Instructions include what is to be done, medical conditions expected, and what equipment is available for particular special procedures. Supervisor helps employee with unusual situations which have no clear precedents.

The technician plans and carries out procedures, handles problems and deviations in the work assignment in line with previous training and accepted practices. The technician uses judgment and initiative that include selecting appropriate instruments and methods, recognizing conditions that cause erroneous results, and troubleshooting complex instruments. At this level the technician may participate with physician in planning procedures. The technician rarely consults the supervisor for technical advice and independently makes recommendations about procedures or changes to procedures in some situations. The supervisor checks completed work for results achieved and for conformance to hospital policy and overall adequacy of results produced.

FACTOR 3, GUIDELINES

Level 3-1--25 points

Guidelines consist of well established test and treatment procedures, and instrument manuals that specify methods and materials needed to carry out test or treatment procedures and the features of the equipment, set up, operation, and maintenance. Detailed guidelines cover all aspects of the work.

The technician works in strict adherence to the guidelines. The technician refers conditions that require deviations from the guidelines to the supervisor for direction.

Level 3-2--125 points

Well established procedures for doing the work are available. Specific guidelines include written descriptions of standard tests or treatment procedures; written or oral instruction from the physician; instrument manuals containing instructions for the assembly and maintenance of the medical instrument; and instructions for procedural and administrative aspects of the assignment (for example, sterilizing and testing equipment, transporting equipment, documenting patients records of test or treatment, ordering and storing equipment and supplies.) Other guidelines include text books and other technical publications.

The number and similarity of guidelines and work situations require the technician to use judgment in identifying and selecting the most appropriate guideline, reference, or procedure (for example, using appropriate methods to calibrate or standardize instruments); making minor deviations to adapt the guidelines in specific cases (for example, manipulating or changing instruments to meet requirements of the tests); and determining which of several established alternatives to use to check and correct a problem.

Level 3-3--275 points

Guidelines are available, but are not completely applicable to work. The technician must frequently make searches in textbooks, journals, and technical manuals for application to individual cases. Decision criteria do not cover every situation (for example, confirming unusual test results; using an altered technique; assessing and correcting unexpected reactions or errors; or the complexity of patients' illness and physical condition).

The technician uses judgment to adapt and change procedures, adopt or develop new procedures or techniques for individual problems. The technician uses initiative to learn new developments in the field and to recommend changes to improve service, correct deficiencies, and improve reliability of test and treatment results. The procedures and techniques adapted or developed by the technician form the basis for hospital standardization.

FACTOR 4, COMPLEXITY

Level 4-1--25 points

The technician performs procedures that are specific, well defined, clearly related to the performance of routine diagnostic and treatment procedures, and easily mastered such as setting up, calibrating, and cleaning equipment.

There is little or no choice in deciding what needs to be done. Standard procedures and instructions from the supervisor directly apply.

The technician performs repetitive assignments with few possible variations and with little likelihood of complications.

Level 4-2--75 points

The work consists of standardized and related duties involving several sequential steps, processes, and methods to perform a variety of diagnostic or treatment tasks of limited difficulty.

Decisions about what needs to be done involve various choices requiring the technician to recognize the existence of and differences among a few easily recognizable alternatives. For example, the technician must consider factors that are clear, comparable and readily checked to adjust diagnostic or treatment equipment and procedures to patient's medical condition. Technician must also recognize adverse reaction to test or treatment that suggest a need to end the procedure. The work includes such tasks as discriminating between normal and abnormal test results, recognizing factors that affect results, and identifying technical or instrument related problems.

Actions taken by the technicians differ with the medical condition of the patient, differences in type of test or treatment ordered by the physician, and difference in patient responses to treatment.

Level 4-3--150 points

The work includes a variety of duties involving performance of different specialized diagnostic and treatment procedures, methods, and techniques.

Decisions about what needs to be done depends on instruments, examination and treatment procedures, and other variables. The work typically requires interpreting a variety of conditions and elements such as patient condition, medication, or instrument performance to be sure of test results. For example, the technician may change settings based on a sudden onset of physical signs or symptoms of distress by the patient.

The chosen course of action is selected from several alternatives, for example, when procedures do not give acceptable results they select a different procedure. Technician must identify and

analyze factors related to the equipment operation and patient responses to discern their interrelationships. At this level emergency situations require precise timing and coordination of action with others while making quick and accurate adjustments to the instrument in response to physician orders or patient condition.

Level 4-4--225 points

The work typically involves full responsibility for the technical aspects of the specialization and includes a wide variety of duties involving diverse and complex technical problems, (for example, testing, refining, and implementing new procedures and developing procedural instructions to insure proper performance of procedures).

Decisions involve complicating factors which hinder use of standard procedures and normal alternatives. Such factors include changing technology, inadequate information about the use and capabilities of new instruments, seriousness of the illness and mental and physical capacity of the patient, requests for changed procedures, test alternatives, or special studies to meet specific clinical situations and research requirements.

The work performed by the technician requires variations of technical factors to accommodate the patients condition; extending standard test methods; changing conventional methods to produce acceptable results; developing new or revised procedures using standard techniques; or refining existing procedures.

FACTOR 5, SCOPE AND EFFECT

Level 5-1--25 points

The work involves performance of specific, routine duties that include diagnostic or treatment procedures and performance of tasks such as disassembling, cleaning, and sterilizing instruments and equipment, and setting up and checking basic equipment. The work is in support of higher level technicians.

The work aids other technicians providing diagnostic and treatment services.

Level 5-2--75 points

The work involves performance of a variety of specific diagnostic procedures and treatment techniques which represent a significant segment of the total diagnostic and treatment plan for the patient.

The work has a significant affect on the accuracy and reliability of further treatment.

Level 5-3--150 points

The work involves performance of a variety of specialized diagnostic and treatment procedures. Positions at this level provide diagnostic and treatment services during regular and recurring critical care situations.

The work has a significant impact on the well being of the patient.

**FACTOR 6, PERSONAL CONTACTS AND
FACTOR 7, PURPOSE OF CONTACTS**

Match the level of assigned, recurring, and personal contacts with their purpose and credit the appropriate point value using the chart below.

Persons Contacted

1. Employees within the service area and with patients in a highly structured situation, that is, in the presence of a higher grade technician.
2. Employees within the hospital, but outside the immediate work unit, patients, their families, physicians, nurses, other professional and technical personnel or students or faculty from affiliated universities.

Purpose

- a. To exchange information.
- b. To coordinate work efforts and resolve technical problems.

		P U R P O S E	
C O N A C T S		A	b
	1	30	60
	2	45	75

*This combination is probably unrealistic.

FACTOR 8, PHYSICAL DEMANDS

Level 8-1--5 points

The work requires no special physical demands. It may involve some sitting, walking and standing for short periods or carrying light instruments and supplies.

Level 8-2--20 points

The work requires regular and recurring physical exertion. It may involve walking, frequent bending, reaching and stretching to set up and take apart equipment; lifting and positioning patients; and carrying, pushing, or pulling moderately heavy objects. Duties may require above average dexterity.

FACTOR 9, WORK ENVIRONMENT

Level 9-1--5 points

Technicians perform the work in a setting involving everyday risks which require normal safety precautions. There is adequate light, heat, and ventilation in the work area.

Level 9-2--20 points

Technicians perform the work in a setting involving regular and recurring exposure to infectious and contagious diseases, odors and other risks which require special health and safety precautions such as wearing protective clothing such as gloves, masks, or, lead aprons.