

CHAPTER 204: AUDIOLOGY AND SPEECH PATHOLOGY SERVICE

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1 PURPOSE AND SCOPE

This document outlines Space Planning Criteria for Chapter 204: Audiology and Speech Pathology Service. It applies to all medical facilities at the Department of Veterans Affairs (VA).

2 DEFINITIONS

Accessible: A site, building, facility, or portion thereof that complies with provisions outlined in the Architectural Barriers Act of 1968 (ABA).

Architectural Barriers Act (ABA): A set of standards developed to insure that all buildings financed with federal funds are designed and constructed to be fully accessible to everyone. This law requires all construction, renovation, or leasing of sites, facilities, buildings, and other elements, financed with federal funds, to comply with the Architectural Barriers Act Accessibility Standards (ABAAS). The ABAAS replaces the Uniform Federal Accessibility Standards (UFAS).

Assistive Devices/Assistive Listening Devices: Assistive devices include, but are not limited to, alarm systems, alarms clocks, doorbell amplifiers and signalers, telephone amplifiers and signalers, and television amplifiers. Assistive listening devices include personal amplifiers, FM systems, voice carry over phones (VCO), teletype devices (TTY), and teletext devices for the deaf (TDD).

Audiology and Speech Pathology: Audiology and Speech Pathology is typically a combined service or equivalent service-level department. Audiology and Speech-language Pathology may be organizationally and physically separated.

Audiology: A clinical specialty involving the prevention, identification, evaluation, and remediation, and treatment of hearing loss, tinnitus, and vestibular disorders.

Audiologist: A health care professional specializing in the prevention, identification, evaluation, treatment, and remediation of auditory and vestibular disorders.

Clinic Stop: A clinic stop is one encounter of a patient with a health care provider. Per these criteria, the clinic stop is the workload unit of measure for space planning. One individual patient can have multiple clinic stops (encounters) in a single visit or in one day.

CAT (Computer Aided Therapy): Computer aided therapy is the use of computers and software to assist patients in achieving treatment goals or learning to use computers and computer supported devices. Includes computer access training.

Electrophysiology: Special diagnostic tests involving the measurement of auditory evoked potentials from the cochlea, auditory nerve, or brain including electrocochleography, auditory brainstem response (ABR), middle latency potentials (MLR), late potentials, and other specialized evoked potential techniques.

Full-Time Equivalent (FTE): A staffing parameter equal to the amount of time assigned to one full time employee. It may be composed of several part-time employees whose total time commitment equals that of a full-time employee. One FTE equals 40 hours per week.

Functional Area: The grouping of rooms and spaces based on their function within a clinical service. Typical Functional Areas are Reception Areas, Patient Areas, Support Areas, Staff and Administrative Areas, Residency and / or Externship (training) Program Areas.

Input Data Statement: A set of questions designed to elicit information about the healthcare project in order to create a Program for Design (PFD) based on the criteria parameters set forth in this document. Input Data Statements could be Mission related, based in the project's Concept of Operations; and Workload or Staffing related, based on projections and data provided by the VHA or the VISN about the estimated model of operation. This information is processed through mathematical and logical operations in VA-SEPS.

Otoacoustic Emissions: Otoacoustic emissions (OAE) are electrical potentials generated in the inner ear. Clinically, two OAE are measured: transient-evoked OAE (TOAE) and distortion product OAE (DPOAE). These measures are used to evaluate hearing loss objectively.

Posturography: Posturography (also known as computerized dynamic posturography) is a battery of tests to evaluate balance function using a series of tasks to simulate situations encountered in daily life. Tests measure sensory organization, motor control, and proprioceptive aspects of balance. Tests can be used to evaluate postural stability and movement strategies in patients with disequilibrium or prone to falling.

Program for Design (PFD): A space program based on criteria set forth in this document and specific information about Concept of Operations, workload projections and staffing levels authorized.

Room Efficiency Factor: A factor that provides flexibility in the utilization of a room to account for patient delays, scheduling conflicts, and equipment maintenance. Common factors are in the 80 to 85% range. A room with 80% room efficiency provides a buffer to assume that this room would be available 20% of the time beyond the planned operational practices of the room. This factor may be adjusted based on the actual and/or anticipated operations and processes of the room / department.

SEPS (VA-SEPS): Acronym for Space and Equipment Planning System, a digital tool developed by the Department of Defense (DoD) and the Department of Veterans Affairs to generate a Program for Design (PFD) and an Equipment List for a VA healthcare project based on specific information entered in response to Input Data Questions. VA-SEPS incorporates the propositions set forth in all VA Space Planning Criteria chapters. VA-SEPS has been designed to aid healthcare planners in creating a space plan based on a standardized set of criteria parameters.

Speech-Language Pathology: A clinical specialty involving the prevention, identification, evaluation, treatment, and rehabilitation of speech, language, voice, fluency, cognitive, and swallowing disorders.

Speech-Language Pathologist: A health care professional specializing in the prevention, identification, evaluation, treatment, and rehabilitation of speech, language, voice, fluency, cognitive, and swallowing disorders.

Vestibulography: Vestibulography is a general class of special balance tests including electronystagmography, videonystagmography, and sinusoidal vertical axis rotational testing (rotary chair). These tests record nystagmus and eye movements to diagnosis peripheral and central vestibular disorders.

Workload: Workload is the anticipated number of encounters or visits that is processed through a department/service area. The total workload applied to departmental operational assumptions will determine overall room requirements.

3 OPERATING RATIONALE AND BASIS OF CRITERIA

- A. Workload Projections or planned services / modalities for a specific VA medical center, hospital or satellite outpatient clinic project are provided by the VA Central Office (VACO) / VISN CARES Capacity Projection Model. The workload projections are generated by methodology based upon the expected veteran population in the respective market / service area. Health care planners working on VA medical center, hospital or satellite outpatient clinic projects will utilize and apply the workload based criteria set forth herein for identified services to determine room requirements for each facility.
- B. Space planning criteria have been developed on the basis of an understanding of the activities involved in the functional areas of Audiology and Speech-Language Pathology and its relationship with other services of a medical facility. These criteria are predicated on established and/or anticipated best practice standards, as adapted to provide environments supporting the highest quality health care for Veterans.
- C. These criteria are subject to modification relative to development in the equipment, clinical practice, vendor requirements, and subsequent planning and design. The selection of the size and type of Audiology and Speech-Language Pathology equipment is determined by VACO and upon Veterans Health Administration (VHA) anticipated clinical needs.
- D. Room capacity per year should be based on:

$$\frac{\text{Operating days per year} \times \text{Hours of operation per day}}{\text{Minutes per clinic stop} / 60 \text{ minutes}} = \text{Number of annual clinic stops}$$

- 1. The general planning model for VA facilities assumes 250 Operating Days per Year and 8 Hours of Operation per Day. Room capacity will fluctuate as hours of operation are modified, i.e., additional capacity may be generated by extending the daily hours of operation within the same physical setting.
- 2. The Basic Room Efficiency Factor for Audiology and Speech Pathology Service is 80%.
- 3. Average length of procedure for Audiology Clinic is 69 minutes.

Example: Assume an exam / treatment room for Audiology Clinic that averages 69 minutes per clinic stop:

$$\frac{250 \text{ Operating days per year} \times 8 \text{ Hours of operation per day}}{69 \text{ Minutes per clinic stop} / 60 \text{ minutes}} = \text{Number of annual clinic stops}$$

A maximum capacity of 1750 clinic stops per year, assuming 100% utilization. However, 100% utilization is not realistic to achieve, thus, it is not realistic as a design standard. Apply Room Efficiency Factor for an affiliated facility:

$$1750 \times 80\% = 1400 \text{ annual clinic stops.}$$

TABLE 1: WORKLOAD PARAMETER CALCULATION

SERVICE	AVERAGE LENGTH OF CLINIC STOP (minutes)	UTILIZATION RATE	MINIMUM WORKLOAD TO GENERATE ONE ROOM
Audiology	69	80%	1400
Speech Pathology	128	80%	750

The number of annual clinic stops per room will be used as a criteria parameter to calculate the number of Exam / Treatment Rooms in the Space Criteria section of this document.

4 INPUT DATA STATEMENTS

A. Mission Input Data Statements

1. Is a combined Audiology and Speech Pathology Service authorized? (M)
2. Is Cerumen Management authorized? (M)
3. Is Posturography authorized? (M)
4. Is Sinusoidal Vertical Axis Rotational Testing authorized? (M)
5. Is Speech Analysis authorized? (M)
6. Is Speech-Language Pathology Group Therapy authorized? (M)
7. Do existing space limitations preclude use of Audiometric Examination Suites? (M) (If Yes, Audiometric Examination Booth(s) will be provided; if NO, Audiometric Examination Suites will be provided)
8. Is Speech-Language Pathology Special Procedures authorized? (M)

B. Workload Input Data Statements

1. How many annual Audiology Clinic stops are projected? (W)
2. How many annual Speech-Language Pathology Clinic stops are projected? (W)

C. Staffing Input Data Statements

1. How many Audiologist FTE positions are authorized? (S)
2. How many Speech-Language Pathologist FTE positions are authorized? (S)
3. How many Speech-Language Pathology Assistant FTE positions are authorized? (S)
4. How many Audiology Health Technician FTE positions are authorized? (S)
5. How many Administrative Assistant FTE positions are authorized? (S)
6. How many Clerical FTE positions are authorized? (S)

D. Miscellaneous Input Data Statements

1. How many FTEs will work on peak shift? (Misc)
2. How many FTE positions are not authorized to have an office or work space? (Misc)

5 SPACE CRITERIA

A. FA 1: Reception Area:

1. **Waiting (WTG03).....80 NSF (7.5 NSM)**

Provide one if the projected number of Exam / Treatment Rooms is two; provide WTG06 if the projected number of Exam / Treatment Rooms is three or four; provide WTG09 if the projected number of Exam / Treatment Rooms is five or six; provide WTG12 if the projected number of Exam / Treatment Rooms is seven or eight; provide WTG15 if the projected number of Exam / Treatment Rooms is nine or ten; provide WTG18 if the projected number of Exam / Treatment Rooms is eleven or twelve; provide WTG21 if the projected number of Exam / Treatment Rooms is thirteen or fourteen; provide WTG24 if the projected number of Exam / Treatment Rooms is fifteen or sixteen; provide WTG27 if the projected number of Exam / Treatment Rooms is seventeen or eighteen; provide WTG30 if the projected number of Exam / Treatment Rooms is nineteen or twenty.

Exam / Treatment Rooms are:

- a. Audiometric Examination Suite,
- b. Audiometric Examination Booth,
- c. Programming / Fitting,
- d. Auditory Rehabilitation,
- e. Speech Language Pathology Special Procedures, and
- f. Speech Language Pathology Individual Therapy Consult Room

WTG03: Allocated space accommodates one standard chair @ 9 NSF, one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation; total three people.

WTG06: Allocated space accommodates four standard chairs @ 9 NSF each, one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation; total six people.

WTG09: Allocated space accommodates seven standard chairs @ 9 NSF each, one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation; total nine people.

WTG12: Allocated space accommodates ten standard chairs @ 9 NSF each, one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation; total twelve people.

WTG15: Allocated space accommodates eleven standard chairs @ 9 NSF each, two bariatric chairs @ 14 NSF each, two accessible spaces @ 10 NSF each, and circulation; total fifteen people.

WTG18: Allocated space accommodates fourteen standard chairs @ 9 NSF each, two bariatric chairs @ 14 NSF each, two accessible spaces @ 10 NSF each, and circulation; total eighteen people.

WTG21: Allocated space accommodates seventeen standard chairs @ 9 NSF each, two bariatric chairs @ 14 NSF each, two accessible spaces @ 10 NSF each, and circulation; total twenty-one people.

WTG24: Allocated space accommodates twenty standard chairs @ 9 NSF each, two bariatric chairs @ 14 NSF each, two accessible spaces @ 10 NSF each, and circulation; total twenty-four people.

WTG27: Allocated space accommodates twenty-one standard chairs @ 9 NSF each, three bariatric chairs @ 14 NSF each, three accessible spaces @ 10 NSF each, and circulation; total twenty-seven people.

WTG30: Allocated space accommodates twenty-four standard chairs @ 9 NSF each, three bariatric chairs @ 14 NSF each, three accessible spaces @ 10 NSF each, and circulation; total thirty people.

2. **Reception / Control Clerk (RCP02)**..... **260 NSF (24.2 NSM)**
Provide one for the Audiology Clinic.

Allocated NSF accommodates two Receptionist FTEs, patient privacy area, and circulation.

3. **Toilet, Public (TNP01)**..... **60 NSF (5.6 NSM)**
Provide two for the Audiology Clinic.

Allocated NSF accommodates one accessible toilet @ 25 NSF, one wall-hung lavatory @ 12 NSF, ABA clearances, and circulation. One for male and one for female.

B. FA 2: Audiology Clinic Patient Area:

1. **Exam / Consult Audiology (EXAU1)**..... **120 NSF (11.2NSM)**
Provide one for every increment of two Audiologist FTE positions authorized.

2. **Exam / Consult Audiology Technician (EXAU1)**..... **120 NSF (11.2 NSM)**
Provide one for every increment of two Health Technician FTE positions authorized.

3. **Suite, Audiometric Examination (TREN2)** **260 NSF (24.2 NSM)**
Provide one if at least one Audiologist FTE position is authorized; provide an additional one for every increment of 1,400 projected annual Audiology clinic stops greater than 1,400.

4. **Booth, Audiometric Examination (PEHS2)**..... **130 NSF (12.1 NSM)**
Provide one for every increment of 1,400 projected annual Audiology clinic stops; (see Table 1) if use of an Audiometric Examination Booth is authorized.

A suite consists of an examination room and a control room. A booth consists of an examination room only. Prefabricated sound suites / booths are used for audiometric examinations, acoustic immittance tests, otoacoustic emission tests, hearing aid fitting and modification, and for research activities that require a highly controlled acoustic and electromagnetically shielded environment. When compensation and pension exams will be performed, audiometric suites must be provided. Booths will be provided only when design limitations preclude installation of suites. Special attention must be given to the privacy, acoustic, and electromagnetic radiation environments in which sound suites/booths will be located. See "Booth Audiometric Examination Specifications" (IB 11-87) for technical specifications for audiometric sound rooms.

5. **Programming / Fitting (HAFR1)**..... **120 NSF (11.2 NSM)**
Minimum NSF; provide an additional 40 NSF if the projected annual Audiology clinic stops is greater than 1,400.

This room accommodates the special equipment used to program and fit digital hearing aids and bioelectric implants.

6. **Auditory Rehabilitation (OPMH1).....240 NSF (14.0 NSM)**
Minimum NSF; provide an additional 40 NSF if the projected annual Audiology clinic stops is greater than 1,400.

This room accommodates the special equipment used to fit assistive devices and assistive listening devices and to demonstrate such devices in a simulated home environment. This room is used by the audiologist to provide counseling and auditory rehabilitation or other therapy to groups of patients and / or family members. This room can also be configured for individual therapy.
7. **Instrument Calibration and Storage (BHER1).....140 NSF (13.1 NSM)**
Minimum NSF; provide an additional 60 NSF if the projected annual Audiology clinic stops is greater than 1,400.

This area accommodates the facilities required to maintain, modify, calibrate and store clinical and research equipment and supplies.
8. **Electrophysiology (OPAE1).....120 NSF (11.2 NSM)**
Provide one for the Audiology Clinic.

This room accommodates the specialized equipment utilized in measuring auditory evoked potentials, such as brainstem auditory evoked potentials (ABR) or electrocochleography (ECOG) for diagnostic purposes.
9. **Hearing Aid Fabrication / Modification (HATL1).....150 NSF (14.0 NSM)**
Minimum NSF; provide an additional 60 NSF if the projected annual Audiology clinic stops is greater than 1,400.

This room accommodates the special equipment used to fabricate and modify custom hearing aids and ear molds. This room also provides storage for parts and supplies.
10. **Posturography (EXRG3)150 NSF (14.0 NSM)**
Provide one if Posturography is authorized.

This room accommodates special equipment used to evaluate balance disorders.
11. **Vestibulography (EXRG3).....150 NSF (14.0 NSM)**
Provide one for the Audiology Clinic.

This room accommodates the special equipment utilized in performing electronystagmography (ENG) or videonystagmography (VNG) for patients with balance or vestibular disorders.
12. **Sinusoidal Vertical Axis Rotational Test (Rotary Chair) (EXEN1)240 NSF (22.3 NSM)**
Provide one if Sinusoidal Vertical Axis Rotational Tests are authorized.

This room accommodates special equipment utilized in performing vertical axis rotational tests for patients with vestibular disorders.
13. **Cerumen Management (EXEN1).....140 NSF (13.1 NSM)**
Provide one if Cerumen Management is authorized.

This accommodates special equipment for Cerumen management (ear wax removal). This room is typically equipped as an ENT exam room.
14. **Toilet, Patient (TPG01).....60 NSF (5.6 NSM)**
Provide one for the Audiology Clinic.

Allocated NSF accommodates one accessible toilet @ 25 NSF, one accessible wall-hung lavatory @ 13 NSF, ABA clearances, and circulation. This Patient Toilet is associated with vestibulography.

C. FA 3: Speech-Language Pathology Clinic Patient Area:

1. **Exam / Consult Room, Speech-Language Pathology (EXOS1)..... 120 NSF (11.2 NSM)**
Provide one for every increment of two Speech-Language Pathologist FTE positions authorized.

2. **Exam / Consult Room, Speech-Language Pathology Assistant (EXOS1)..... 120 NSF (11.2 NSM)**
Provide one for every increment of two Speech-Language Pathology Assistant FTE positions authorized.

3. **CAT (Computer Aided Therapy) Workroom (WRCH1) 120 NSF (11.2 NSM)**
Provide one for the Speech-Language Pathology Clinic.

This area provides workstations and associated CAT storage. This area is formerly known as Computer Access.

4. **Exam Room, Speech Analysis (EXOS1)..... 200 NSF (18.6 NSM)**
Provide one if Speech Analysis is authorized.

This room accommodates special equipment to measure and analyze the acoustic properties of speech and voice for the purpose of diagnostic evaluation and treatment.

5. **Special Procedures (TREN1) 240 NSF (22.3 NSM)**
Provide one if Speech-Language Pathology Special Procedures are authorized; provide an additional one if the annual Speech-Language Pathology clinic stops projected is greater than 1,500 (Refer to Table 1).

This room accommodates the special equipment used for instrumental evaluation and treatment including laryngoscopy, stroboscopy, fiberoptic Endoscopy (FEES), surface electromyography (SEMG), cervical auscultation, respiration and swallow coordination assessment, manometry, and other diagnostic equipment. This room also accommodates digital imaging equipment to view radiology images. This room is also used for tracheo-esophageal puncture voice prosthesis fitting procedures.

6. **Consult Room Speech-Language Pathology, Individual Therapy (OFDC2) 120 NSF (11.2 NSM)**
Provide one for every increment of 750 annual Speech-Language Pathology clinic stops projected.

7. **Speech-Language Pathology Group Therapy (OPMH1) 225 NSF (20.9 NSM)**
Provide one if a Speech-Language Pathology Group Therapy is authorized.

8. **Observation Core (OPMH3) 50 NSF (4.7 NSM)**
Provide one for the Speech-Language Pathology Clinic.

This room permits trainees to observe therapy. The observation core should be adjacent to the individual/group therapy rooms to allow trainees to observe therapy / treatment.

D. FA 4: Support Area:

1. **Storage, Equipment and Supplies (SRSE1).....100 NSF (9.4 NSM)**
Minimum one, provide an additional one if Speech Pathology is authorized.

Planner can combine these into one space.

E. FA 5: Staff and Administrative Area:

1. **Office, Audiology and Speech Pathology Service Chief (OFA09) ..100 NSF (9.3 NSM)**
Provide one for Audiology and Speech Pathology Service.

2. **Waiting (WTG03).....80 NSF (7.5 NSM)**
Provide one for Audiology and Speech Pathology Service.

Allocated space accommodates one standard chair @ 9 NSF, one bariatric chair @ 14 NSF, one accessible space @ 10 NSF, and circulation; total three people.

3. **Workstation, Secretary (OFA07)56 NSF (5.3 NSM)**
Provide one for Audiology and Speech Pathology Service.

4. **Workstation, Administrative Assistant (OFA07)56 NSF (5.3 NSM)**
Provide one per Administrative Assistant FTE position authorized.

5. **Workstation, Clerical (OFA07).....56 NSF (5.3 NSM)**
Provide one per each Clerical FTE position authorized.

6. **Lounge, Staff (SL001)80 NSF (7.5 NSM)**
Minimum NSF; provide an additional 15 NSF per each Audiology and Speech Pathology Service FTE position working on peak shift greater than five; maximum 210 NSF.

7. **Locker Room, Staff (LR001)80 NSF (7.5 NSM)**
Minimum NSF if total number of Audiology and Speech Pathology Service FTE positions not authorized to have office or work space is between five and thirteen; provide an additional 6 NSF per each Audiology and Speech Pathology Service FTE position not authorized to have office or work space is greater than thirteen.

Provide locker space only for those FTEs without assigned office or work space. For less than five FTE combine Locker Room facilities with adjacent department or sum in chapter 410.

8. **Toilet, Staff (TNP01)60 NSF (5.6 NSM)**
Minimum one; provide an additional one for every increment of fifteen Audiology and Speech Pathology Service FTE positions working on peak shift greater than fifteen.

Allocated NSF accommodates one accessible toilet @ 25 NSF, one wall-hung lavatory @ 12 NSF, ABA clearances, and circulation.

F. FA 6: Education Area:

1. **Team Room (SL002).....240 NSF (22.3 NSM)**
Provide one for the Audiology Clinic and one for the Speech-Language Pathology Clinic.

This space will be used by trainees and staff for patient charting and consultation. The area will accommodate five workstations, a small conference table and personal property lockers for use by medical students.

2. **Training Room, Resident (CFR01) 240 NSF (22.3 NSM)**
Provide one for the Audiology Clinic and one for the Speech-Language Pathology Clinic.

Allocated NSF accommodates six conference chairs @ 7.5 NSF each, two 5'-0" x 2'-0" tables at 10 NSF each, one credenza @ 8 NSF, and circulation; total six people.

6 PLANNING AND DESIGN CONSIDERATIONS

- A. Net-to-department gross factor (NTDG) for Audiology and Speech Pathology is **1.55**. This number when multiplied by the programmed net square foot (NSF) area determines the departmental gross square feet.
- B. Audiology Clinics must be carefully located with regard to proximity of intrusive noise and electromagnetic radiation sources. Audiology Clinic areas will be carpeted (except for vestibulography and cerumen management areas). Other acoustic controls will be considered to minimize ambient noise in the clinic area. Waiting areas should be physically separated from clinic areas. Sound suites/booths shall be recessed into pits to provide unencumbered access. If not feasible, floors must be raised to eliminate sills.
- C. Waiting areas in Speech-Language Pathology Clinics should be physically separated from clinic areas.
- D. Speech analysis room (Speech-Language Pathology) requires acoustic controls to minimize ambient noise.
- E. Special Procedures (Speech-Language Pathology) room should not be carpeted. Room should be equipped with oxygen and suction. Room should be equipped with refrigerator/freezer drawer for storage of perishable diagnostic materials.

7 FUNCTIONAL RELATIONSHIPS

Relationship of Audiology and Speech Pathology to services listed below:

TABLE 2: FUNCTIONAL RELATIONSHIP MATRIX

SERVICES	RELATIONSHIP	REASON
Ambulatory Care	2	G,H,I
ENT	2	G,H,I
Physical Medicine and Rehabilitation Service	3	G,H
Dental Service	3	G,H,I
Nursing Units (All)	3	H,I
Psychology Service	3	H
Radiology Service	3	H
Canteen Service	X	D,E,L
Dialysis Center	X	D
Electroencephalography Lab (EEG)	X	L
Engineering Service	X	D,E,F
Information Resources Management Service (IRMS)	X	L
Laboratory Service	X	D,F
Lobby	X	D,L
Magnetic Resonance Imaging (MRI)	X	F,L

Legend:

Relationship:

- 1. Adjacent
- 2. Close / Same Floor
- 3. Close / Different Floor Acceptable
- 4. Limited Traffic
- X. Separation Desirable

Reasons:

- A. Common use of resources
- B. Accessibility of supplies
- C. Urgency of contact
- D. Noise or vibration
- E. Presence of odors or fumes
- F. Contamination hazard
- G. Sequence of work
- H. Patient's convenience
- I. Frequent contact
- J. Need for security
- K. Others (specify)
- L. Closeness inappropriate

8 FUNCTIONAL DIAGRAM

