

CHAPTER 268: VETERANS HEALTH ADMINISTRATION - PHARMACY SERVICE

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1 PURPOSE AND SCOPE

This document outlines Space Planning criteria for Chapter 268: Pharmacy Service. It applies to all medical facilities at the Department of Veterans Affairs (VA).

2 DEFINITIONS

- A. ADM Automatic Dispensing Machines: A machine designed for dispensing controlled medication and accounts for stock and inventory use. ADM's are normally located at the patient care units and in diagnostic and treatment departments.
- B. Building Conversion Factor: A parameter, determined by the VA for all healthcare facilities, used to convert the calculated Department Gross Square Foot (DGSF) area to the Building Gross Area. This parameter is set to 1.35 for all project types.
- C. Concept of Operations: A user-developed guide to the functional operation of the VA healthcare facility. It defines the function of the facility and the scope of medical services to be provided in the new or remodeled space.
- D. Departmental Conversion Factor: A parameter, determined by the VA for each Space Planning Criteria chapter, used to convert the programmed Net Square Foot (NSF) area to the Department Gross Square Foot (DGSF) area. The Departmental Conversion Factor for this chapter is 1.30.
- E. Drug Information Service: The objective of this aspect of Clinical Pharmacy Service is to provide complete drug information, upon request, to physicians and other medical staff members. This function may be facilitated through subscribing to the authorized Drug Information Service and other selected textbook references.
- F. 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 a 40 hours per week.
- G. Functional Area: The grouping of rooms and spaces based on their function within a clinical or clinical support service. Typical Functional Areas are Reception Areas, Patient Areas, Support Areas, Staff and Administrative Areas, and Residency Program.
- H. Input Data Statements: 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 for the facility. This information is processed through mathematical and logical operations in VA-SEPS.
- I. Net-to-department-gross (NTDG): See Departmental Conversion Factor.
- J. Program for Design (PFD): A space program generated by VA-SEPS based on criteria set forth in this document and specific information entered about Concept of Operations, Workload projections and Staffing levels authorized.

- K. Satellite Pharmacy: Additional operation locations (inpatient and/or outpatient) that will supplement and support the main inpatient and/or outpatient pharmacies by diverting a portion of the work load to another dispensing area to facilitate a better work and patient flow.
- L. 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 this chapter, and has been designed to aid healthcare planners in creating a space plan based on a standardized set of criteria parameters.
- M. Unit Dose: A method of medication distribution to patients on a single dose at a prescribed time.
- N. Ward Stock Dispensing: Drugs sent to the patient units in bulk for a multi-day supply. The distribution is determined by the drug requisition from Nursing Service.
- O. Inpatient Beds: Are defined as all inpatient beds including acute care, medical surgical beds, mental health beds and nursing home beds.

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. Healthcare 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 and modalities 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 Pharmacy Service 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, medical practice, vendor requirements, and subsequent planning and design. The selection of the size and type of Pharmacy Service equipment is determined by VACO and upon Veterans Health Administration (VHA) anticipated medical needs.
- D. The Pharmacy Service is responsible for the controlled dispensing of all drugs required in the delivery of health care. Controlled dispensing includes the compounding of parenteral and other sterile admixtures, radiopharmaceuticals, and the total drug utilization review process required to maintain a high quality of health care. This process provides information on prescribing patterns, drug utilization review, frequency of individual drug and therapeutic categories, medication regimen costs and adverse drug actions.

- E. The Pharmacy Service will provide drug information and consultation to the patient and all members of the health care team, before, during and after the prescribing process.
- F. Refer to the following space planning criteria chapters to determine additional requirements:
 - Chapter 104, Spinal Cord Injury Center (SCI)
 - Chapter 252, Nuclear Medicine Service

4 PROGRAM DATA REQUIRED (Input Data Questions)

- A. Is an Inpatient Pharmacy authorized? (M)
 - 1. Is a Unit Dose Method authorized? (M)
 - a How many daily unit doses are projected? (W)
 - 2. Is a Ward Method authorized? (M)
 - a How many oral tablets and injectable line items are projected? (W)
 - 3. Is an Automated Replenishment System authorized? (M)
 - 4. Is the facility warehouse authorized to store pharmaceuticals? (M)
 - 5. Is a Pharmacy Education Program authorized? (M)
 - a Is a Clinical Pharmacy Teaching Coordinator FTE position authorized? (M)
 - b How many Pharmacy Intern FTE positions are authorized? (S)
 - c How many Pharmacy Education Program Trainee FTE positions are authorized? (S)
 - 6. Is a Conference Room authorized? (M)
 - 7. Is an Investigational Drug Program authorized? (M)
 - 8. Is handling of Oncology Drugs authorized? (M)
 - 9. How many inpatient beds are projected for this facility? (W)
 - a What percentage of inpatient beds are for Mental Health? (Misc)
 - 10. How many Assistant / Associate Chief FTE positions are authorized? (S)
 - 11. How many Pharmacist FTE positions are authorized? (S)
 - a How many Pharmacist FTEs will work on peak shift? (Misc)
 - 12. How many clerical FTE positions are authorized? (S)
 - 13. How many Storage Carts are authorized? (Misc)
 - 14. Are flammable liquids authorized to be stored in containers larger than 2.5 gal.? (Misc)
 - 15. How many Pharmacy Service FTEs will work on peak shift? (Misc)
 - 16. How many Pharmacy Service FTE positions are not authorized to have office or cubicle space? (Misc)
- B. Is an Outpatient Pharmacy authorized? (M)
 - 1. How many annual outpatient prescriptions are projected? (W)
 - 2. How many outpatients per hour are projected to be served by this Pharmacy? (W)
 - 3. Are flammable liquids authorized to be stored in containers larger than 2.5 gal. in the Outpatient Pharmacy? (Misc)
- C. Is an Emergency Response Area authorized? (M)

5 SPACE CRITERIA

A. Inpatient Pharmacy Work Areas:

1. **Dispensing Station (PHOD2)135 NSF (12.6 NSM)**

Minimum NSF; provide an additional 135 NSF for every increment of two thousand three hundred projected daily unit doses if a Unit Dose method is authorized; provide an additional 135 NSF for every increment of two hundred forty projected oral tablets and injectable line items if a Ward Stock method is authorized; provide an additional 150 NSF if an Automated Replenishment System is authorized.

2. **Medication Assignment Area (PHOD2).....64 NSF (5.95 NSM)**

Minimum NSF if the total number of projected inpatient beds is between ten and three hundred; provide an additional 64 NSF if the number of projected inpatient beds is greater than three hundred.

This area is for the reviewing and processing physicians' orders, patient profiles and verification of dispensing records.

3. **Vault, Controlled Substances Work Area (PHOD2)240 NSF (22.4 NSM)**

Minimum NSF if the total number of projected inpatient beds is between ten and three hundred; provide an additional 60 NSF if the number of projected inpatient beds is greater than three hundred.

The vault construction is to be in accordance with security standards for those drugs, identified by the Drug Enforcement Agency, requiring separation due to a high potential for abuse.

4. **Dispensing, Secured Controlled Substances (PHOD2)..... 120 NSF (11.2 NSM)**

Minimum NSF if the total number of projected inpatient beds is between ten and three hundred; provide an additional 30 NSF for every increment of one hundred and fifty projected inpatient beds greater than three hundred; provide an additional 100 NSF if the warehouse does not receive and maintain pharmaceuticals.

The secured dispensing area is for administrative control, maintenance, and dispensing of drugs.

5. **Repackaging, Extemporaneous (PHOD2).....125 NSF (11.6 NSM)**

Minimum NSF if number of projected daily unit doses is between one hundred and seven thousand; provide an additional 125 NSF if number of projected unit doses per day is greater than seven thousand.

Drugs not commercially available in the dosage required by the dispensing system are appropriately repackaged in this area.

6. **Stat Counter (PHOD2).....65 NSF (6.9 NSM)**

Provide one per Inpatient Pharmacy.

This area is for preparing and dispensing emergency medication without interrupting the normal function of the Unit Dose Dispensing Station.

7. **Anteroom, Intravenous Admixture (PHIV2)..... 120 NSF (11.2 NSM)**
Provide one per Intravenous Admixture and Aseptic Transfer Room.

This room is provided in compliance with USP 797.

8. **Aseptic Transfer Room, Intravenous Admixture (PHIV2) 250 NSF (16.7 NSM)**
Minimum NSF if the total number of projected inpatient beds is between ten and three hundred; provide an additional 50 NSF for every increment of one hundred projected inpatient beds if the total number of projected inpatient beds is greater than three hundred; provide an additional 40 NSF if twenty five percent or less of the projected inpatient beds are for Mental Health.

An intravenous (IV) admixture requires the addition of prescribed medication to an IV solution. The preparation takes place in a clean environment workstation using aseptic transfer techniques.

9. **Drug Information Area (XXYYC) 120 NSF (5.6 NSM)**
Provide one per Inpatient Pharmacy.

B. Inpatient Pharmacy Support Areas:

1. **Storage, Controlled Substances Flammable Liquids (PHBS2) 60 NSF (5.6 NSM)**
Provide one if flammable liquids are stored in containers larger than 2.5 gal.

This is a specially designated area meeting fire and safety regulations for the storage of flammable controlled substances and other flammable items.

2. **Receiving, Breakdown and Verification Area (PHOD2)..... 160 NSF (14.9 NSM)**
Minimum NSF; provide an additional 25 NSF for every increment of one hundred projected inpatient beds.

This is where drugs purchased by Pharmacy are received, checked-in, orders verified, and temporarily held for future dispersment to functional areas.

3. **Receiving, Inventory and Verification Area (PHOD2)..... 80 NSF (7.4 NSM)**
Provide one per Inpatient Pharmacy.

4. **Refrigeration / Freezer, Intravenous Admixture (SRF01)..... 35 NSF (3.3 NSM)**
Provide one per Inpatient Pharmacy.

5. **Storage, Sterile Fluids and Admixture Sets (PHBS2)..... 900 NSF (93 NSM)**
Minimum NSF if the total number of projected inpatient beds is between ten and four hundred; provide an additional 100 NSF if total number of projected inpatient beds is greater than four hundred.

This is the storage area for the supplies necessary for the IV admixture program and distribution point to the wards for automatic replenishment of the IV and irrigation solutions and administration sets.

6. **Refrigeration / Freezer Area (SRF01)**.....**80 NSF (7.5 NSM)**
Minimum NSF if the total number of projected inpatient beds is between ten and four hundred; provide an additional 35 NSF for every increment of two hundred projected inpatient beds greater than four hundred.

7. **Storage, Active (PHBS2)**.....**800 NSF (74.3 NSM)**
Minimum NSF if the total number of projected inpatient beds is between ten and four hundred; provide an additional 50 NSF for every increment of one hundred projected inpatient beds greater than four hundred.

All drug items that must be available for stocking shelves, dispensing, repacking, and manufacturing are stored here.

8. **Storage, Cart (XXYYC)**.....**10 NSF (0.9 NSM)**
Minimum NSF; provide an additional 5 NSF per each cart greater than one.

This is the holding area for carts required for the distribution of drugs to the using units.

9. **Storage, Poison Control (PHBS2)**.....**20 NSF (1.9 NSM)**
Provide one per Inpatient Pharmacy.

Can be combined with other medication storage.

C. Inpatient Pharmacy Education Program:

1. **Office, Clinical Pharmacy Teaching Coordinator (OFA01 / OFA02)**.....**120 NSF (11.2 NSM)**
Provide one if authorized in Concept of Operations; provide OFA01 if standard furniture is authorized; or, OFA02 if systems furniture is authorized.

2. **Laboratory, Pharmaceutical Experimentation (XXYYC) 150 NSF (13.9 NSM)**
Provide one per Pharmacy Education Program.

3. **Office, Intern (OFA01 / OFA02)**.....**120 NSF (11.2 NSM)**
Provide one per Intern FTE position authorized; provide OFA01 if standard furniture is authorized; or, OFA02 if systems furniture is authorized.

4. **Cubicle, Study (OFA03)****32 NSF (2.9 NSM)**
Provide one per Pharmacy Education Program Trainee FTE position authorized.

D. Inpatient Pharmacy Investigational Drug Program:

1. **Work Area (PHOD2)****50 NSF (7.4 NSM)**
Provide one if Investigational Drug Program is authorized in Concept of Operations.

This space is for the storage and protocols

2. **Storage (PHBS2)****100 NSF (9.3 NSM)**
Provide one if Investigational Drug Program is authorized in Concept of Operations.

E. Inpatient Pharmacy Staff and Administrative Areas:

1. **Office, Chief (OFM02)** **150 NSF (14.0 NSM)**
Provide one per Pharmacy Service.
2. **Office, Secretary and Waiting (SEC01)**..... **120 NSF (11.2 NSM)**
Provide one per Pharmacy Service.
3. **Office, Assistant / Associate Chief (OFA01 / OFA02)**..... **120 NSF (11.2 NSM)**
Provide one per Assistant / Associate Chief FTE position authorized; provide OFA01 if standard furniture is authorized; or, OFA02 if systems furniture is authorized.
4. **Office, Pharmacist (OFD03)** **120 NSF (11.2 NSM)**
Provide one per Pharmacist FTE working on peak shift.
5. **Cubicle, Clerical (OFA03)**..... **64 NSF (5.9 NSM)**
Provide one per clerical FTE position authorized.

Does not include prescription receiving, dispensing and filling personnel.

6. **Server Room (CMP02)** **30 NSF (2.8 NSM)**
Provide one per Pharmacy Service.
7. **Conference Room (CRA01)**..... **250 NSF (23.3 NSM)**
Provide one if authorized in Concept of Operations.

F. Inpatient Pharmacy Staff Lounge, Lockers and Toilets:

The spaces below provide programming of Lounge, Lockers, and Toilets at department / service / chapter level. Alternatively, sum all departments/services data for Lockers, Lounges and Toilets, and program space in Chapter 410-EMS Lockers, Lounges, Toilets and Showers. Either/or – do not duplicate space. Program locker space only for those FTEs without office or cubicle space.

1. **Lounge, Staff (SL001)**..... **80 NSF (7.5 NSM)**
Minimum NSF; provide an additional 15 NSF per each projected FTE on peak shift greater than five; maximum 210 NSF.

For less than five FTE combine Lounge facilities with adjacent department or sum in chapter 410.

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

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

3. **Toilet, Staff (TLTU1)** **50 NSF (4.7 NSM)**
Minimum one; provide an additional staff toilet for each increment of five projected FTEs on peak shift greater than thirteen.

G. Oncology Drugs Areas:

1. **Preparation Area (PHOD2)**.....**180 NSF (16.7 NSM)**
Provide one if handling of Oncology drugs is authorized in Concept of Operations.
2. **Anteroom, Intravenous Admixture (PHOD2)****60 NSF (5.6 NSM)**
Provide one if handling of Oncology drugs is authorized in Concept of Operations.

This space is provided in compliance with USP 797.

3. **Reference Area (PHOD2)****80 NSF (7.4 NSM)**
Provide one if handling of Oncology drugs is authorized in Concept of Operations.
4. **Storage and Clean / Decontamination Area (PHBS2)****60 NSF (5.6 NSM)**
Provide one if handling of Oncology drugs is authorized in Concept of Operations.

H. Outpatient Pharmacy Patient Areas:

1. **Waiting (WRC01)****300 NSF (28 NSM)**
Minimum NSF; provide an additional 200 NSF for each additional twenty outpatients served per hour greater than thirty.
2. **Toilet, Public (TLTU1)****50 NSF (4.7 NSM)**
Provide one for male and one for female.

I. Outpatient Pharmacy Work Areas:

1. **Prescription Receiving Window (PHOD1)****180 NSF (16.8 NSM)**
Minimum two; provide an additional window for every increment of eight thousand annual outpatient prescriptions projected greater than sixteen thousand.

This space, adjacent to the waiting area, is where patients present their prescriptions for filling. The perimeter includes the security window and pass-through compartments or the especially designated stations used in the open concept.

2. **Prescription Filling and Assembly Area (PHOD2)****70 NSF (6.6 NSM)**
Minimum NSF; provide an additional 60 NSF for each Prescription Receiving Station Window greater than two.

This area is contiguous to the prescription receiving area. The functions performed here include: receiving the prescription, retrieving the patient profile package, typing the label, attaching all the above together, and holding them for the pharmacist.

3. **Prescription Dispensing Area (PHOD2) 135 NSF (12.6 NSM)**
Minimum NSF; provide an additional 135 NSF for every increment of one hundred thousand projected annual outpatient prescriptions greater than one hundred thousand.

The procedures required in completing the filing of prescriptions (e.g., pouring, counting, labeling, review) are performed here.

4. **Filling, Active (PHOD2)..... 180 NSF (16.8 NSM)**
Minimum NSF; provide an additional 180 NSF for every increment of one hundred thousand projected annual outpatient prescriptions greater than one hundred thousand.

All medication items which must be available for prescription dispensing and filling is stored in this area.

5. **Mail Out, Prescription (PHOD2) 100 NSF (9.3 NSM)**
Minimum NSF; provide an additional 100 NSF for every increment of two hundred thousand projected annual outpatient prescriptions greater than one hundred thousand.

This area is for assembling and packaging the non-controlled medications for mailing to patients, packing equipment, supplies and mail sacks are also maintained in this area.

6. **Receiving, Breakdown and Verification Area (PHOD2)..... 120 NSF (11.2 NSM)**
Minimum NSF; provide an additional 50 NSF for every increment of one hundred thousand projected annual outpatient prescriptions greater than one hundred thousand.

When the receiving areas (inpatient and outpatient) are located together, the BSM/NSF of the two areas will be combined. Drugs and other items purchased by pharmacy are received, reviewed, and checked-in.

7. **Office, Inventory Control / Stock Management Clerk (OFA01 / OFA02) 120 NSF (11.2 NSM)**
Provide one per Outpatient Pharmacy; provide OFA01 if standard furniture is authorized; or, OFA02 if systems furniture is authorized.

8. **Consultation Room (OFDC2) 120 NSF (11.2 NSM)**
Provide one per Outpatient Pharmacy.

This is an area set aside for confidential consultation between the pharmacist, patient and family or friends. The need and purpose of the patient's medication will be reviewed and the regimen clarified.

J. Outpatient Pharmacy Support Areas:

1. **Storage, Prepackaged Medication (PHMP2) 150 NSF (14 NSM)**
Provide one per Outpatient Pharmacy.

Prepackaged medication staging.

2. **Storage, Controlled Substances and Secured Dispensing Area (PHMP2)** **150 NSF (13.10 NSM)**
Provide one per Outpatient Pharmacy.

This is the vault and dispensing area for the drugs, identified by the Drug Enforcement Agency (DEA) requiring separation from other medications due to high abuse potential. The vault construction is to be in accordance with security standards for these drugs.

3. **Storage, Flammable Liquids (SRHM1)**..... **60 NSF (5.6 NSM)**
Provide one if flammable liquids are stored in containers larger than 2.5 gal.

This area is designed in accordance with fire and safety regulations governing the storage of flammable substances (e.g., alcohol, ether, and anesthesia preparations.)

4. **Refrigeration / Freezer Area (SRF01)**..... **120 NSF (11.2 NSM)**
Minimum NSF; provide an additional 100 NSF for every increment of two hundred thousand projected annual outpatient prescriptions greater than one hundred thousand.

5. **Storage, Prosthetic and Medical Supplies (SRCS1)** **150 NSF (13.9 NSM)**
Minimum NSF; provide an additional 100 NSF for each increment of one hundred thousand projected annual outpatient prescriptions greater than two hundred thousand.

Bulk items such as ostomy appliances, gauze pads, tape, syringes, linen savers and other items prescribed to outpatients are stored here.

6. **Toilet, Staff (TLTU1)** **50 NSF (4.7 NSM)**
Provide one per Outpatient Pharmacy.

7. **Housekeeping Aides Closet - (HAC) (JANC1)** **40 NSF (3.7 NSM)**
Provide one per Outpatient Pharmacy.

K. Emergency Response Areas:

1. **Pharmacy Cache Area (XXYYC)**..... **2,000 NSF (186 NSM)**
Provide one if authorized and if in Concept of Operations.

6 DESIGN CONSIDERATIONS

- A. Net-to-department gross factor (NTDG) for Pharmacy Service is **1.30**. This number when multiplied by the programmed net square foot (NSF) area determines the departmental gross square feet.
- B. The Outpatient Pharmacy shall be located near and readily accessible to the outpatient clinics and walk-up area.
- C. Ideally, a dedicated vertical transport system will be provided between the Inpatient Pharmacy and other Pharmacy Medication Areas on each level.

- D. The Main Inpatient Pharmacy, Outpatient Pharmacy and Satellites should (where feasible) be linked to the main pharmacy by a dedicated materials handling system that is capable of transporting bulk medications.
- E. A rapid demand request delivery system capable of transporting intravenous solutions, immediate medication doses, and physician orders between the inpatient pharmacy and the nursing units should be provided.
- F. The Main Pharmacy shall have easy access to the receiving dock for receipt of bulk pharmaceutical supplies.
- G. Careful consideration must be given to the design of all pharmacy space with respect to security. Particular emphasis must be given to areas that house controlled substances.
- H. Satellite Pharmacies shall be adequately sized to provide its own unit dose and IV admixture functions.
- I. Drug information service shall be available at all drug preparation areas.
- J. Flammable storage will be located in the Controlled Substance Vault and Secured Dispensing Area.
- K. When the inpatient and outpatient pharmacies are combined in one location, similar areas should be combined and become a shared facility with a total of their combined net square footage.
- L. When the inpatient and outpatient pharmacies are combined in one location, similar areas should be combined and become a shared facility with a total of their combined net square footage.
- M. Locations where IV Admixture functions take place, transfer areas must be provided in accordance to the USP 797 Compounding Sterile Preparation standards.
- N. A laminar flow hood in the IV Admixture Aseptic Transfer Room demands special cooling requirements because of the heat it generates while in use.
- O. The fume hood requirements for the Oncology Drugs area must be considered.

7 FUNCTIONAL RELATIONSHIP

Relationship of Pharmacy Service to services listed below:

TABLE 1: FUNCTIONAL RELATIONSHIP MATRIX

SERVICE	RELATIONSHIP	REASONS
Surgery	1	A,B,C,G,I
Critical Care	2	B,C,H,I
Oncology Nursing Unit	2	B,C,F,H
Ambulatory Care	3	F,G
Dialysis Center	3	G
Prosthetics and Sensory Aids Service	3	F,G,H
Supply Service - Warehouse	3	A,B,I

Relationship:

1. Adjacent
2. Close / Same Floor
3. Close / Different Floor Acceptable
4. Limited Traffic
5. 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 convenience
- I. Frequent contact
- J. Need for security
- K. Closeness inappropriate

8 FUNCTIONAL DIAGRAM

