Responsibility for Selecting the Site of an Emergency Hospital

The Provincial or Zonal Director of Emergency Health Services will select the general tactical areas for the siting of Emergency Hospitals in accordance with the overall Provincial Emergency Health Services plan. Having nominated the basic team of leaders (Key Personnel) for a particular hospital and arranged for their training, basic and specialized, he should in close liaison with the Medical Director select particular buildings in the chosen area which may be suitable to house an Emergency Hospital and arrange for 'on the site' inspections. All other agencies who may require the use of buildings in the area should be consulted to avoid overlap in planning measures. After these 'on the site' inspections have been completed, the final decision on the selection of a building may be made and general planning for the establishment of an Emergency Hospital in a disaster situation proceeded with in detail.

Factors to be Considered in Selection of a Building

The following factors should be considered initially in the selection of a building to house an Emergency Hospital in the pre-planning stage;

1. Location not less than 25 miles and not more than 100 miles from the centre of a target area.
2. A site up-wind from the target area in relation to the prevailing high atmospheric winds
3. Reasonable proximity to existing hospitals in the same area.
4. The geographical relationship of the planned operational sites (primary and alternates) of the Advanced Treatment Centres (ATC) to the Emergency Hospital, in particular the routes by which casualties will be transported from the ATC's to the Emergency and the existing hospitals.
5. Liaison with other agencies. Planning priorities have been established through an allocation of emergency tasks. In the initial shock-phase Provincial Emergency Health Services, Emergency Welfare Services and the Department of National Defence will be given priorities for emergency accommodation to meet their needs, by the Wartime Accommodation Control Organization. To avoid conflicts of interest with these other agencies, concerning the selection of buildings for operational use, adequate liaison must be made with the Zone Accommodation Controller or at Municipal level with the Local Accommodation Control Office where such agencies have been established.
6. The location of rendez-vous points for assigned hospital personnel and those medical personnel leaving target areas to relocate. Such points must be reasonably close to the location of the Emergency Hospital to allow rapid dispersal of medical and para-medical personnel to Emergency Hospitals and Advanced Treatment Centres.
7. Communication facilities particularly from the Emergency Hospital to Municipal Emergency Government Headquarters.
8. The egress routes from the Emergency Hospital to existing hospitals outside the 100 mile ring by road, rail and, if pertinent, by waterway.

The Medical Director should be familiar with:–

1. The Provincial, Zonal and Municipal Emergency Health Services Plans of the area in which they will operate.
2. The general supplies and equipment of the Emergency Hospital both for the 7-day shock-phase and the 23 day back-up supplies.

He must have in addition a thorough knowledge of:–

a) The space requirements for the various functional areas of the hospital

b) The general plans of the building selected for use as an Emergency Hospital

c) The inherent radiation protection factor (PF) of the building structures and methods

of augmenting this PF in an emergency. This entails adequate consultation with the Radiation Protection Officer in the pre-planning phase

d) Procedures necessary for the clearance of the building of furnishings and equipment required for hospital use

e) The communication facilities for intra-and extra-hospital use

f) The arrangement of utilities in the selected building

g) The arrangement for traffic-control and transportation of casualties to and from the hospital

h) The logistic situation, with emphasis on the immediate means of re-supply.

Criteria for Adaptibility of a building

There are a number of criteria which should be met before selecting a building for use as an emergency hospital:

1. A *usable* floor-space of sixteen thousand to eighteen thousand square feet
2. A number of easy entrance and exit facilities; if possible an entrance drive-way with open ends
3. Ample parking space for vehicles
4. Wide corridors and stairways
5. Standard-sized doors
6. Good lighting, heating and ventilation
7. Sufficient wash-room and toilet facilities for a minimum of four hundred persons
8. A large hall or similiar area of some fifteen hundred square feet near the main entrance, to be used in the sorting of casualties
9. Facilities for the preparation and serving of food.

Selection of a Building

Elementary or secondary schools with 18 or more classrooms, when completely cleared of furniture, have many of the features outlined above and should be given initial consideration in the selection of buildings for operational use.

Other buildings such as large motels or other commercial buildings may have to be considered, if there are no suitable school buildings in a particular area. All other factors being equal, if there is more than one building adaptable for use as a hospital the one with the highest structural protection factor should be chosen.

Space Requirements for Functional Areas

The standard Canadian classroom is approximately 700 square feet in area. Some classrooms, however may be up to 1100 square feet in area. In school buildings a minimum of 16,000 – 18,000 square feet of *useable* space is required to set up the Emergency Hospital. The primary index which may be utilized in planning is the number of completely cleared classrooms. General classrooms will be easily cleared of desks and chairs to make space available. Some however, eg. Home Economics rooms and Physics Laboratories will have permanent fittings which will preclude their use in an emergency for ward space etc. There are always administrative offices small rooms and store rooms which are useful to site particular functional areas. The laboratory may be set up for example in a Physics Laboratory.

	Minimum Square Footage Required
Administration Area	300
Monitoring and decontamination	300
Admission and discharge (sorting)	1500
Resuscitation (pre-operative and Recovery Wards (Post-operative)	2500
Operating Room Area	1000
Central Supply Area	1000
Pharmacy and Pharmacy Stores	700
X-Ray	300
Laboratory	300
Service Utilities	300
Mortuary	300
Wards (8 General) 160 Beds	8000
Feeding Service (E.W.S.)	700
Total Space required	17,200

Floor Plans

An architect's floor plan of the building should be obtained. Because of the considerable

variations in the arrangements of floor space, each building should be surveyed separately. After a preliminary "on-site" inspection of the building, the Medical Director should discuss with the members of the basic team the proposed layout of the functional areas. Using the architect's floor plan, overlays of the functional areas should be prepared and from these overlays, a sufficient number of copies of the floor plans indicating the conversion of the building to hospital use, should be prepared both for training and operational purposes. Considerable time and thought should be given to this aspect of planning.

Planning the layout of Functional Areas

Before the "on site" inspection of a building the Medical Director should have a clear knowledge of:

1. The minimum space required for each functional area
2. The physical arrangements required for each functional area relative to casualty flow in an emergency hospital (see figure 3)
3. The power source requirements for certain equipment of the emergency hospital which must be installed in a building not designed for these particular items of equipment. eg. the portable autoclaves, the X-ray apparatus.

It may be useful primarily to consider the emergency hospital as having four main complexes:

1. Admission and Sorting complex – a large area such as an auditorium or gymnasium should be selected close to the main entrance
2. Surgical Treatment complex – Resuscitation, Operating Rooms and Recovery areas – a location should be selected contiguous with, or close to the admission and sorting complex but in a location away from the main hospital traffic flow
3. Supply complex – Central Supply, Pharmacy and Pharmaceutical Stores areas – locations should be selected contiguous or close to the treatment complex
4. Nursing Complex (the 8 wards) – a location should be selected in the building with easy access of 1. 2 and 3., by corridor or by stairway if the wards are placed on the first floor of the building.

Having selected a general layout for four main complexes the ancillary functional areas, – Administration, X-ray, Laboratory, etc. should be considered for spatial planning in their required relationships to the main complexes.

Special Facilities required in Functional Areas

Each functional area has its own particular requirements relative to power and water supply, ventilation, toilet and washing facilities, etc. The facilities available in the building should be carefully detailed and recorded by the basic cadre.

Specific Requirements to be noted:

Admission and Discharge (sorting) Area

Large area close to main entrance and with easy access to other sections of the building

Administration Area

Should be close to Admission and Discharge (sorting) Area, and have facilities for external communications systems

Resuscitation Area

Close to admission area on the ground floor, water supply required

Operating Rooms

Adequate water supply, electrical outlets, good lighting and ventilation – on the ground floor

Recovery Area

Close to operating rooms on ground floor; adequate water supply required

Central Supply Area

Close to operating rooms on ground floor; adequate water supply, electrical and if possible steam outlets; good ventilation, one wall must be an outside wall with an aperture for lead-in piping from propane cylinders

Pharmacy Area

Close to Central Supply, must have adequate water supply

X-Ray Room

Should have as many external walls as possible in a corner of the building on the ground floor;

FIGURE 3

PATIENT FLOW IN THE EMERGENCY HOSPITAL

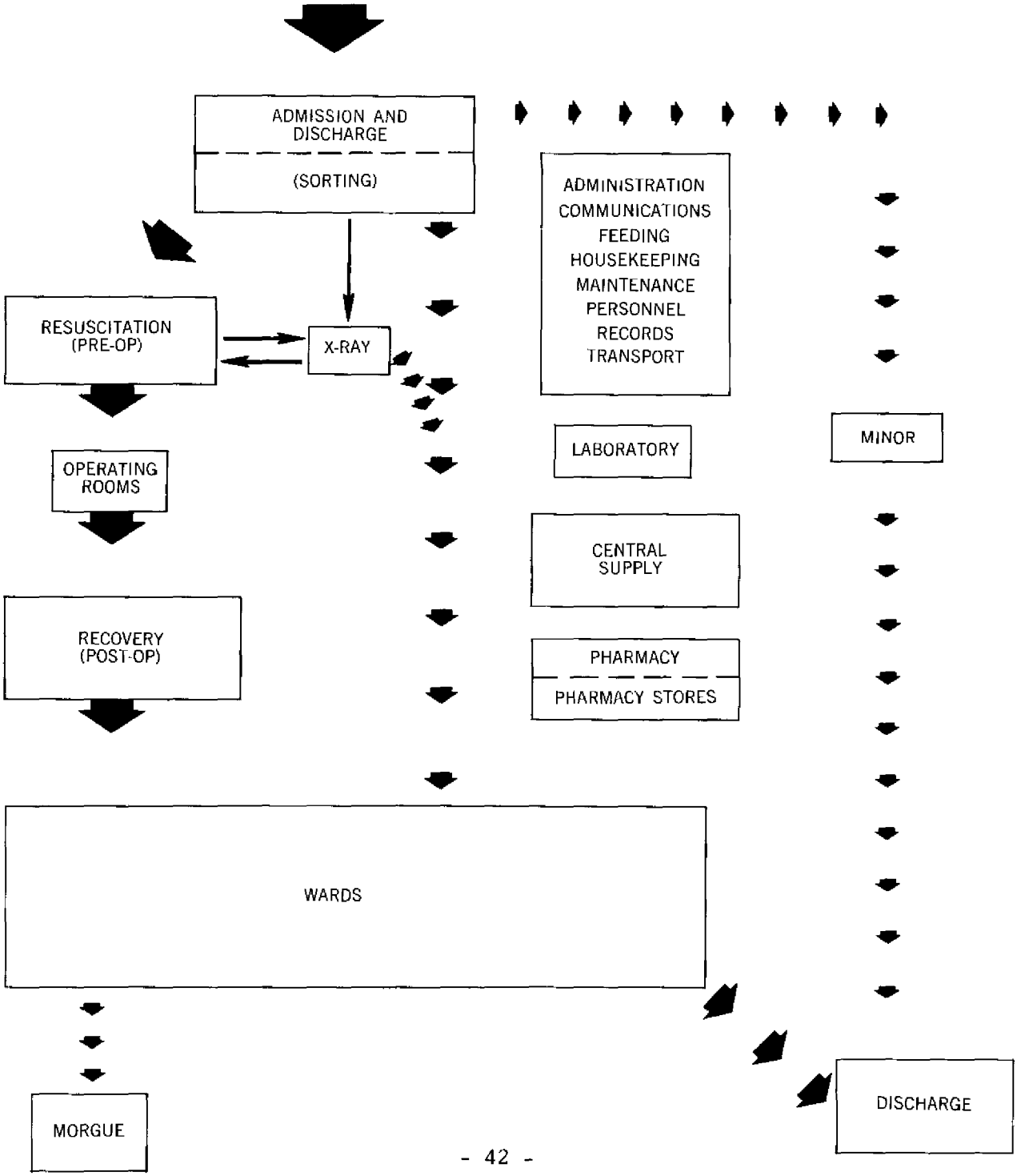
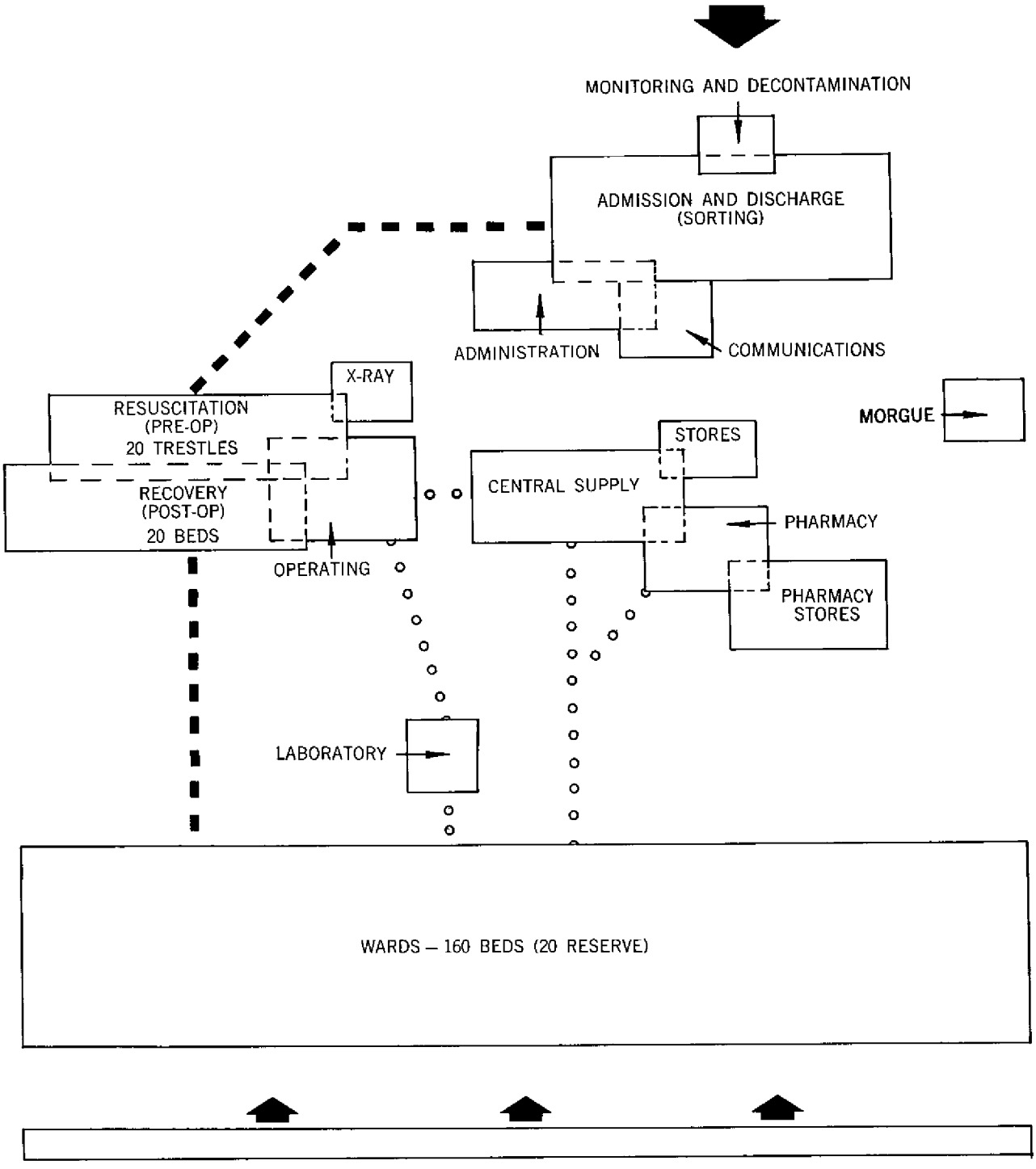


FIGURE 4

FUNCTIONAL AREAS

THE INTER-RELATIONSHIPS OF THE FOUR MAIN COMPLEXES



the three kilowatt generator must be outside the building and there must be an aperture for lead-in cabling

Laboratory

Water supply, electrical outlets;

Wards

May be on first floor with adequate water supply, should have easy access to Central Supply Area and Pharmacy access stairways should be wide

Service Utilities

The auxiliary water tank and pump should be located within the grounds of the building if possible under cover. The 10 Kilowatt generator should be located in the grounds of the building in a position fairly close to the main electrical Panel.

Special Considerations Required in planning for Equipment and Power Sources

Heavy Equipment

The following pieces of heavy equipment should be placed on the ground floor:

1. The ten kilowatt generator (outdoors)
2. The portable X-ray unit – the three kilowatt gas-powered generator for this unit must be operated outside the building (see plate 14).
3. The portable autoclaves – the initial fuel supply for those pieces of equipment is propane gas and the propane gas tanks must be placed outdoors, (see plate 9).

Lead-In Cables and Piping

The lead-in cable for the X-ray unit from the three kilowatt generator is one hundred feet in length and the copper-piping fuel lines from the propane cylinders to the autoclaves and the water boiling sterilizer are each twenty-five feet in length. The X-ray room and the sterilizing section of the Central Supply Area should therefore be in rooms on the ground floor having a window or other aperture on an external wall to facilitate lead-in of cables and piping.

Sterilizing Section of the Central Supply Section

In the area selected as the sterilizing section of the Central Supply Area there should be two 220 volt electrical outlets to connect the two large portable autoclaves to line voltage to ensure that this source of power may be available for use in an emergency. If the building has a source of steam, arrangements may have to be made in the planning phase to have suitable steam outlets installed in this section, if they are not already present. Steam couplings are provided in the hospital supplies, to attach to such outlets. Outside venting must be provided and materials for the venting obtained from local resources.

Electrical and Heating Supplies Sources

Some of the emergency hospital equipment is designed to function effectively from auxiliary sources of heating and electrical power supplied with the hospital. All available sources of power present in the building however, must be considered for use during the planning phase. The Medical Director should take into consideration the following points:

1. Power Sources for Hospital Equipment

(a) The two autoclaves and the water boiling sterilizer will use propane gas initially as a heating source

(b) If other sources of heating, steam, natural gas, or electricity are not available in an emergency arrangements must be made with Local Supply Officer at Municipal Emergency Government Headquarters to continue the supply of propane gas which is sufficient for 48 hours of continuous operation. (5 tanks of propane gas)

(c) If the main supply of electricity is disrupted the 10 kilowatt generator will be used. This generator is designed to provide sufficient power to operate some emergency hospital lighting, the operating room lights and suction apparatus and the water pump, not including the portable autoclaves

(d) If steam, electricity or natural-gas power are not available the autoclaves must continue to be operated on propane gas or they may be wood or coal-fired as a last resort. The latter method must be carried out with the autoclaves outside the building under suitable cover