

## Chapter-5 Support Services

*Whether support services like drug storage, sterilisation, hygiene, waste management, infection control, ambulance, power back-up/ UPS, etc. had aided the line departments in providing a safe and sterile environment.*

### 5.1 Storage of Drugs

Drugs and Cosmetic Rules, 1945 stipulate parameters for the storage of drugs in stores to maintain the efficacy of the procured drugs before issue to patients. The norms and parameters prescribed in the said Rules were, however, not adhered to as observed during Joint Physical Verification (JPV) conducted along with the Pharmacists/ staff of the selected DM&HOs and DHs as tabulated below.

**Table 5.1: Deficiencies in storage of drugs**

Parameters	Deficiencies observed during JPV
Availability of cold room/ refrigerators in the district drugs warehouse to avoid loss of efficacy and shelf-life of the Drugs.	Except district drugs warehouse at Nongpoh, cold room/ refrigerators/ freezers were not available in the other test-checked districts. System to control room temperature and relative humidity was also not available. The Pharmacist of DM&HO Tura informed that medicines requiring refrigeration <i>i.e.</i> cold temperature (2°-8°C) were immediately dispatched to the indenting facilities.
Availability of labelled shelves/ racks/ floor pallet to ensure storage of drugs away from walls and floor.	Shelves and racks were not available, Cupboard for the storage of specific products that must be kept free from dust or light were not available in any of the test-checked District drugs warehouses. Floor Pallets were also not used to ensure storage of drugs off the floor, instead the medicines containers/ consignments were stored directly on the floor. Thus, loss of efficacy and shelf life of drugs due to improper storage cannot be ruled out.
Availability of designated salvage area to store expired drugs separately so as to avoid mixing of expired drugs with usable drugs.	In all the test-checked district drug warehouses, no designated salvage area was available to store expired/ damaged drugs separately. Thus, the possibility of expired drugs getting mixed up with usable medicines cannot be ruled out.
Availability of separate space for storage of phenyl, bleaching powder and other poisonous medicines to avoid/ prevent contamination with general medicines.	In all the test-checked district drug warehouses, no separate space/area for storage of Phenyl, bleaching powder and other poisonous medicines/ chemicals was available. Thus, possibility of contamination with general medicines cannot be ruled out.
Availability of adequate space for orderly storage of drugs and for providing staging areas for preparing shipments (issuing) and unloading deliveries (receiving).	None of the test-checked district drugs warehouse has a declared storage capacity. The pharmacists also could not state the storage capacity of the test-checked district drugs warehouse. During JPV, it was observed that except Nongpoh <sup>21</sup> , the storage capacity/space of all the warehouses was insufficient to allow orderly storage of various categories of medicines and surgical items. Due to inadequate space, staging areas for preparing shipments and deliveries were not available and more importantly, life-saving drugs were seen haphazardly stored along

<sup>21</sup> Adequate space available since the Medical Officer's quarter was converted for the drugs warehouse.

Parameters	Deficiencies observed during JPV
	with phenyl, bleaching powder, surgical equipment, hospital bedding materials, <i>etc.</i>
Existence of Stock control mechanism	In all the test-checked district drugs warehouses, random and periodic checking system by higher authority and stock auditing system was not ensured, time to time physical count of stock was not practiced, Bin cards system was not maintained and the stock accounts were not computerised.

As brought out above the audit verification revealed that parameters of storage and stocking of drugs like refrigeration/cold room, separate storage area for cleaning material and poisonous substances, adequate space for orderly storage of drugs, *etc.* were not adhered to in the test checked DHs. Thus, the prevailing system and condition of the storage of drugs in the test-checked district drugs warehouse were not conducive and were susceptible to theft, damages and contamination.

Photographic evidence of poor storage condition of the drugs in the District drugs warehouse taken during the JPV is given below:

			
Drugs warehouse, Jowai (Photo dt. 14/02/2020)	Drugs warehouse, Tura (Photo dt. 07/02/2020)	Drugs warehouse, Shillong (Photo dt. 11/03/2020)	Drugs warehouse, Nongpoh, (Photo dt. 12/03/2020)

As can be seen from the photographs above, drugs meant for use in the district hospitals were not stored in the prescribed manner in any of the test-checked hospitals, raising concerns about the ability of the hospital staff to retrieve life-saving drugs when required, dispense them to patients efficiently.

As mentioned in **Paragraph Nos. 3.4.1 and 3.4.2**, the requirement of funds for procurement of essential drugs for the hospitals was underestimated and short indented. While several drugs were in a 'stock out' situation, the haphazard manner in which the available drugs are stored makes it difficult to retrieve essential drugs in emergencies and defeat the purpose of availability for patients, when required.

## 5.2 Infection Control

Infection control practices are important in maintaining a safe environment for both patients and staff in the hospitals by reducing the risk of potential spread of hospital associated infections. This section discusses audit findings in respect of various aspects of infection control.

### 5.2.1 Standard Operating Procedures

To prevent hospital-acquired infections in patients, visitors and staff, the NHM Assessor's Guidebook 2013 required each DH to frame a schedule of procedure to be

followed by the health care facilities known as Standard Operating Procedures (SOP). Audit observed that SOP was available only in Tura MCH, the other three test-checked DHs did not prepare SOP for Infection Control. Non-availability of SOP resulted in lack of structural response to issues of hygiene and infection control in these DHs as discussed in the succeeding paragraphs.

### 5.2.2 Hospital Infection Control Committee (HICC)

As per NHM Assessor's Guidebook 2013, Hospital Infection Control Committee (HICC) has to be constituted to frame, implement and monitor infection control policies in the hospital. The availability of HICC, date of formation and number of meetings in test-checked DHs is shown in the table below:

**Table 5.2: HICC of the test-checked DHs**

Name of the District Hospital	Status of HICC	Date of formation of HICC	No. of HICC meetings during 2014-19
Shillong CH	Yes	Record not available	01
Nongpoh CH	Yes	July 2016	02
Jowai CH	No	-	Nil
Tura MCH	Yes	September 2015	Nil

Source: Records of test-checked DH.

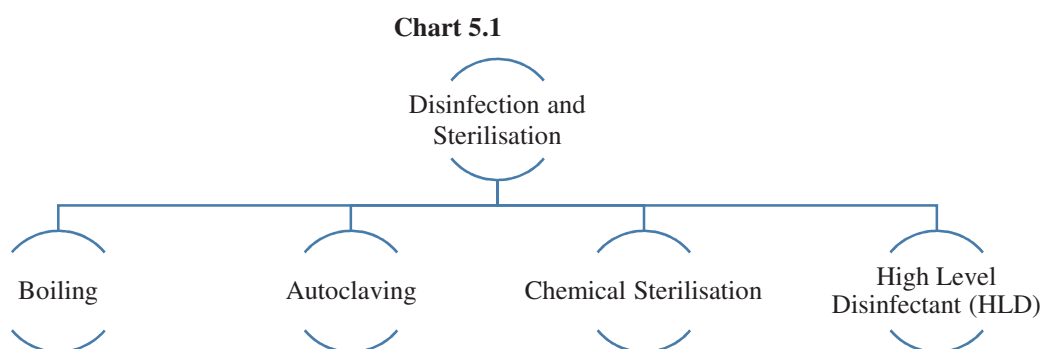
Thus, it could be seen that Jowai CH did not have the Committee (HICC) constituted, whereas Tura MCH did not conduct any meeting, the Shillong and Nongpoh CH had not convened/ held HICC meetings regularly.

### 5.2.3 Pest and Rodent Control

Controlling spread of infection through rodents and pests in the hospitals is an important component of infection control practices as per NHM Assessor's Guidebook 2013. Audit observed that only Tura MCH maintained records of pest and rodent control in the test-checked hospitals. In the absence of records in three out of four test-checked DHs, Audit could not derive an assurance whether these hospitals followed pest and rodent control practices.

### 5.2.4 Disinfection and Sterilisation

As per Hospital Infection Control Guidelines of Indian Council of Medical Research (ICMR), disinfection and sterilisation helps prevent the build-up of bacteria/viruses, etc. on the medical tools, linen and consumables and reduce the chances of spread of infection in patients and staff of hospitals. NHM Assessor's Guidebook recommends boiling, autoclaving, high level disinfection (HLD) and chemical sterilisation process for disinfection/sterilisation in the DHs as shown in following chart.



Generally, critical instruments/ equipment (those penetrating skin or mucous membrane) should undergo sterilisation before and after use, *e.g.* surgical instruments. Semi-critical instruments/ equipment (those which come in contact with the intact mucous membrane without penetration) should undergo high level disinfection before use and intermediate level disinfection after use, *e.g.* endotracheal tubes. Availability of the methods of disinfection and sterilisation in the test-checked hospitals was as shown in the table below:

**Table 5.3: Availability of methods of disinfection and sterilisation in the test-checked DH**

Name of the DH	Boiling	Autoclaving	Chemical Sterilisation	HLD
Shillong DH	Yes	Yes	Yes	Yes
Nongpoh DH	Yes	Yes	Yes	No
Jowai DH	Yes	Yes	No	No
Tura MCH	Yes	Yes	Yes	Yes

Source: JPV and records of test-checked DHs.

We saw that Chemical sterilisation facilities were not available at Jowai CH and HLD were not available at Jowai CH and Nongpoh CH, thereby exposing patients to risk of acquiring secondary infections.

### 5.2.5 Maintenance of Autoclave Machine

As per IPHS, there should be an Annual Maintenance Contract (AMC) for all equipment which need special care and preventive maintenance to avoid breakdown and reduce downtime of such equipment.

Audit observed that although all the four test-checked DHs have installed Autoclave Machine, AMCs of Autoclave machine was not done in three DHs viz. (i) Tura MCH, (ii) Jowai CH and (iii) Nongpoh CH. The AMC of Autoclave machine in Shillong CH was also not renewed after expiry. In absence of AMC for equipment like autoclave, *etc.* in the test-checked hospitals, Audit could not derive an assurance regarding preventive maintenance of sterilisation equipment.

### 5.2.6 Validation of autoclaving process

NHM Assessor's Guidebook requires that biological indicators should be used in all the hospitals to prevent insecticide toxicity due to interactions with the membrane. Such biological indicators are a tool to validate the steam-based sterilisation process in autoclave machine.

Audit observed that whereas this indicator was used in Tura MCH and Jowai CH, Shillong CH and Nongpoh CH did not use it, resulting in non-validation of the sterilisation process using autoclave machine.

### 5.3 Cleaning Services

#### 5.3.1 Standard Operating Procedure for housekeeping

IPHS required framing of SOP for housekeeping by the hospital authority, to provide a clean environment to patients, visitors, staff and to ensure cleanliness of the hospital premises.

Audit observed that SOP for housekeeping was not available in three test-checked DHs viz. (i) Shillong CH, (ii) Jowai CH and (iii) Nongpoh CH. Non-availability of SOP resulted in lack of structural response to issues of hygiene and cleanliness in the Hospital.

#### 5.3.2 Hygiene practices

NHM Assessor's Guidebook 2013 prescribes that the hospital must have a system to take air and surface samples for microbiological survey to check for infections.

Audit observed that none of the test-checked DHs have carried out surface/ air/ hand swab tests during 2014-19. Thus, Audit could not derive an assurance regarding effectiveness of cleaning of surfaces and hands hygiene of hospital staff in the test-checked hospitals.

#### 5.3.3 Cleanliness in the Hospitals

NHM Assessor's Guidebook 2013 requires that the hospitals should ensure decontamination of functional areas.

Audit observed the following deficiencies during JPV:

Toilet in poor condition: Audit noticed that the toilets in the test-checked DHs were in poor condition due to absence of essential items like Tap and Cistern as shown in the photographs:			
Urinals were also in poor condition due to non-availability of urinal bowl and flush, urinal without flush and outlet pipe, etc.			
	Male surgical ward of Shillong CH	Toilet at OPD of Tura MCH	Toilet at OPD of Jowai CH
	Urinals at Male ward of Shillong CH		Urinal at OPD Nongpoh CH

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<p>The NHM Assessor's guidebook envisaged that hospital drain should be covered to provide safe and secured environment to the staffs, patients and visitors.</p>			
<p>Heavy seepage at various location in Shillong CH was noticed.</p>			
<p>All-weather motorable Approach Road was not available in Tura MCH and Jowai CH.</p>			
<p>Distance of at least 2.5 metre between centres of two beds to prevent cross infection and allow bedside nursing care was not ensured in Shillong CH and Tura MCH.</p>			
<p>IPHS envisaged that size of the corridors should be at least 3.0 m wide to ensure smooth and conducive for manoeuvrability of wheeled equipment, etc.</p>			
	<p>Nongpoh CH (1.55m)</p>	<p>Shillong CH (2.6m)</p>	<p>Jowai CH (2.0m)</p>

Thus, due to poor conditions of toilets, drainage facilities, seepages in hospital rooms and norms for safe distance between hospital beds and for size of corridors not being met. We could not derive an assurance in the test checked DHs regarding effective

housekeeping service to provide an infection free environment to patients, visitors and staffs.

### 5.3.4 Immunisation and Medical Check-up of Staff

NMH Assessor Guidebook envisages provision of periodic medical check-ups and immunisation of staff to safeguard them from spread of infection.

The number of Medical Check-ups and Immunisation Programmes of staff members conducted during 2014-19 in the test-checked DHs are shown in the following table:

**Table 5.4: Immunisation and Medical Check-up of staff at test-checked DHs**

Name of the DH	2014-15	2015-16	2016-17	2017-18	2018-19
Shillong CH	Nil	Nil	Nil	Nil	3
Nongpoh CH	Nil	Nil	Nil	Nil	Nil
Jowai CH	Nil	Nil	Nil	Nil	3
Tura MCH	1	2	2	2	2

Audit observed that Tura MCH was the only DH which had immunised its medical staff and conducted medical check-ups for staff members regularly. Nongpoh CH had not conducted the check-ups at all whereas Shillong CH and Jowai CH had not regularly conducted the check-ups. The DHs should take steps to ensure that medical check-up and immunisation programmes of staff members are conducted periodically.

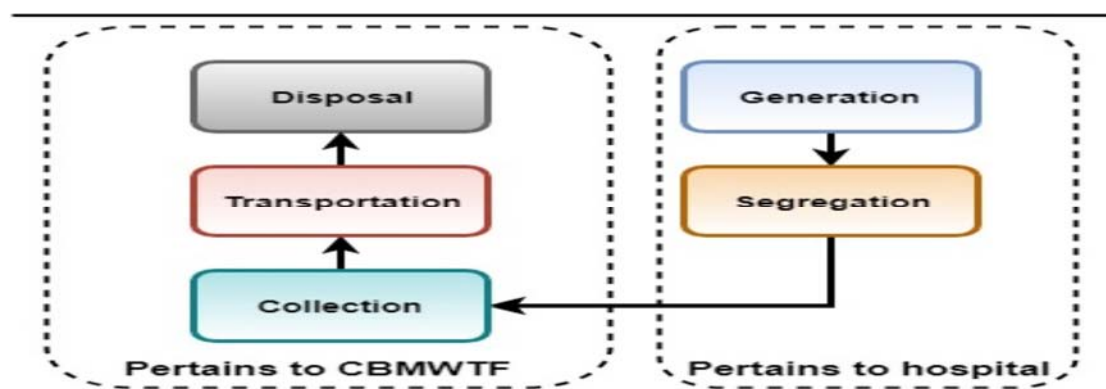
## 5.4 Hospital Waste Management

Hospital waste management, also known as medical waste management, is a system that handles hospital-generated waste, including infectious, chemical, expired pharmaceutical and radioactive items, and sharps.

### 5.4.1 Bio-medical waste management

Bio-medical waste (BMW) is generated during procedures related to diagnosis, treatment and immunisation in the hospitals and its management is an integral part of infection control within the hospital premises. The GoI framed Bio-Medical Waste (Management and Handling) Rules, 1998 under Environment (Protection) Act, 1986, which were superseded by Bio-Medical Waste Management Rules, 2016 (BMW Rules). These rules stipulate the procedures for collection, handling, transportation, disposal and monitoring of the BMW with clear roles for waste generators and Common Bio-Medical Waste Treatment Facilitator (CBMWTF) as shown in the chart below.

**Chart 5.2**



#### **5.4.2 Authorisation for generating BMW**

The BMW Rules required the hospitals generating BMW to obtain authorisation from the State Pollution Control Board (SPCB). The category-wise quantity of BMW generated and their disposal were to be forwarded to SPCB in a prescribed format annually.

Audit observed that all the four test-checked DHs had obtained authorisation from the SPCB to generate BMW.

#### **5.4.3 Segregation of BMW at source**

The BMW Rules require hospitals to segregate different categories of BMW in separate coloured bins at the source of generation. The waste is to be stored in appropriate colour coded bags at the point of generation and collected by the CBMWTF. Audit observed that all the four test-checked DHs were segregating BMW.

#### **5.4.4 Collection of bio-medical waste**

As per BMW Rules, CBMWTF is responsible for collection and proper disposal of BMW from the hospitals. The respective Municipal Authorities of Shillong CH and Tura MCH collect the BMW at respective hospitals. Nongpoh CH and Jowai CH had engaged contractors for collection of BMW. Audit however, did not verify the disposal of BMW collected by Municipal Authorities/ licensed contractors.

During Audit, it was seen that there was huge pile of BMW stored in hospital areas, a health hazard for the patients and staff in the concerned hospitals.

			
Piling up of BMW for about 4-5 months (Shillong CH)	Piling up of BMW (Nongpoh CH)	Mixing of different BMW (Tura MCH).	

#### **5.4.5 Training for management of bio-medical waste**

As per the BMW Rules, it is the responsibility of the health care facilities to ensure that all the staff are provided regular training on BMW handling.

Audit observed that while Shillong CH and Tura MCH had conducted 13 and 15 trainings respectively during 2014-19, Nongpoh CH and Jowai CH had not created awareness among its staff in this regard.

#### **5.4.6 Effluent Treatment Plant (ETP)**

Hospitals consume large volume of water per day for different purposes and also generate large volumes of wastewater that needs to be treated. Further, in respect of liquid chemical waste generated in health care facilities, BMW Rules mandate

segregation of the waste at source and its pre-treatment or neutralisation prior to mixing with other effluent generated from health care facilities. Proper treatment of hospital wastewater is very essential because improper treatment of effluent from hospitals will lead to environment and human health issues. Hence, the selection of suitable treatment technology called Effluent Treatment Plant (ETP) for hospitals is required.

Audit noticed that the DHS(MI) had not established ETPs in any of the test-checked hospitals for pre-treatment of the liquid chemical waste, resulting in drainage of the waste directly into the sewerage system. However, on the directive (30 May 2016) of National Green Tribunal (NGT), the State Government constructed ETPs at Shillong CH and Jowai CH which were made functional on 15 July 2019 and 23 September 2019 respectively. Meanwhile, the ETP constructed at Nongpoh CH, under the directive of the NGT, at a cost of ₹ 45.35 lakh could not be made functional (July 2020) for want of final inspection from the Meghalaya Pollution Control Board. Moreover, Tura MCH did not have an ETP nor did the DHS(MI) plan any ETP at Tura MCH. In the absence of a functional ETP at Nongpoh CH and Tura MCH, proper treatment of effluents from these hospitals would not be ensured, which has serious implications for environment and human health.

## 5.5 Linen and Laundry Services

Proper services of linen and laundry is a recognised support service which not only ensures prevention and containment of hospital infection but also contributes to value addition to the image of the hospital in the eyes of public. Clean linen instils psychological confidence in the patients and the public and enhances their faith in the services rendered by the hospital. Simultaneously, an efficient linen and laundry service is of advantage for hospital marketing and speaks of ability of the medical care services.

Audit observed that there were no written manual policies for collection, washing, calendaring, storage, distribution, *etc.* in the Linen and Laundry Services in the test-checked DHs during 2014-19. However, the standard guidelines were followed *i.e.* (i) segregation of linen like torn, blood stained, urinated, *etc.*, and sanitisation or chemical treatment (if necessary) was done by the ward in-charge and (ii) collection of linen for washing is done by the laundry staff themselves.

### 5.5.1 Availability of linen

The IPHS prescribe the number of different types of linen that are required for patient care services for hospitals. The availability (in percentage) of different prescribed linen in each of the test-checked hospitals (as on the date of JPV) was as follows.

**Table 5.5: Availability of linen in test-checked DHs**

Sl. No.	Linen	Availability (in percentage)			
		Shillong CH	Nongpoh CH	Jowai CH	Tura MCH
1	Bedsheets	146	30	51	63
2	Bedspreads	84	20	26	167
3	Blankets Red and blue	855	480	356	800
4	Draw sheet	274	60	60	Nil
5	Doctor's overcoat	Nil	40	3	167
6	Hospital worker OT coat	10	20	Nil	Nil

Sl. No.	Linen	Availability (in percentage)			
		Shillong CH	Nongpoh CH	Jowai CH	Tura MCH
7	Patients House coat (for female)	18	8	3	Nil
8	Patients Pyjama (for male) Shirt	70	17	15	Nil
9	Over shoes pairs	Nil	30	40	Nil
10	Pillows	89	33	55	50
11	Pillow covers	107	40	17	33
12	Mattress (foam) Adult	95	25	40	50
13	Paediatric Mattress	Nil	Nil	140	Nil
14	Abdominal sheets for OT	38	16	17	Nil
15	Perineal sheets for OT	7	20	13	Nil
16	Leggings	12	Nil	28	Nil
17	Mats (Nylon)	Nil	Nil	Nil	Nil
18	Mackintosh sheet (in meters)	104	375	100	Nil
	Benchmark	100%	100%	100%	100%

Source: Records of test-checked DH.

From the Table above audit observed that out of the total prescribed 18 types of linens, the four test-checked DHs<sup>22</sup> did not have all types of linens. In absence of patient's House coat (for female) in Tura MCH, the in-patients of the hospital were found compelled to wear their personal clothing.

We also noticed shortages of available linens with the shortfall ranging from 5 to 93 per cent at Shillong CH; 40 to 92 per cent at Nongpoh CH; 40 to 97 per cent at Jowai CH and 47 to 67 per cent at Tura MCH.

Due to shortage of basic linen like bedsheets, bedspreads and pillow covers the hospitals could not ensure changing of these linen on every alternate day or on daily basis. Nongpoh CH practiced changing of bedsheet, bedspread, etc., in general wards only after patients are discharged while the other three DHs changed once in a week or when the patients are discharged. This indicates that all the DHs could not fully ensure proper hygienic care services to the in-patients.

### 5.5.2 Deficiencies in laundry services

As per the IPHS, laundry facility should be available in the hospitals to provide well washed and infection free linen to patients. It should be provided with necessary facilities for drying, pressing and storage of soiled and cleaned linens.

During the course of audit (through JPV), we noticed that in four test-checked DHs, specific or demarcated area for laundry was not available nor was coloured bag for segregation, covered trolley for transportation and paper bag for storage was available as per NHM assessor Guidebook. Linen received from different wards were mixed together and washed together. Washing Machine was available only in Tura MCH to provide laundry service while the remaining test checked DHs did not have Washing Machine. Linen were dried in an unhygienic manner in Shillong CH & Jowai CH. Physical Verification of linen was not carried out in Jowai CH and Tura MCH as

<sup>22</sup> Jowai CH (02); Nongpoh CH (03), Shillong CH (04) and Tura MCH (11).

envisaged in NHM Assessor Guidebook. Overall washing quality was not satisfactory as linen with stains was noticed in Shillong CH.

		
Mixing of different type of linen and washing manually at Shillong DH	Presence of stray dogs where linen are dried at Shillong DH	Linen drying place at Nongpoh CH
		
Torn and unhygienic bed sheet with stains (male ward of Shillong DH)	Stained linen and pillow cover (surgical ward at Jowai DH)	Stained linen and pillow cover (surgical ward at Tura MCH)

## 5.6 Ambulance Service

IPHS specify the number of ambulances required for each DH according to the number of beds. Further, IPHS envisage that the ambulances should be provided with basic life support/ advanced life support equipment and communication system.

The actual position of availability of ambulances in test-checked DH and status of provision of basic life support equipment/ communication system is shown in the table below:

**Table 5.6: Ambulance service of the test-checked DHs**

Name of the DH	Requirement as per IPHS	Ambulance available	Shortfall	Availability of	
				Basic life support equipment	Communication system
Shillong CH	4	2	2	No	No
Nongpoh CH	3	1	2	No	No
Jowai CH	3	2	1	No	No
Tura MCH	3	2	1	No	No
<b>Total</b>	<b>13</b>	<b>7</b>	<b>6</b>		

Source: Records of the test-checked hospital.

As can be seen from the above details there was a 46 *per cent* shortage of ambulances and basic life support equipment and communication system or GPS were not fitted/available in any of the available ambulances. Thus, all the test-checked DHs could not provide an effective patient transport service in case of emergencies.

The DHS (MI) stated in the exit conference (July 2020) that ambulance services fitted with life support equipment are being provided through EMRI agency on contract.

The fact however, remains that, the agreement with the EMRI agency was to provide emergency ambulance service to the State by operating from selective ‘locations’<sup>23</sup> based ambulances’ linked to a centralised Call Centre by calling 108 and not placed with any of the DHs round the clock.

#### **5.6.1 Availability of dedicated parking space for ambulances**

As per IPHS and NHM Assessors Guidebook 2013, there should be dedicated parking space for ambulance. During audit, it was noticed that dedicated parking space for ambulance was not available in Nongpoh CH and hence, obstruction free access for the ambulance from other vehicles in times of emergency was not ensured.

### ***Conclusion***

The prevailing system of storage of drugs in the test-checked hospitals was not conducive for orderly storage and as per norms/ parameters making the drugs susceptible to damage, contamination and theft and risk to patients by storing poisonous substances not meant for human consumption, along with the drugs.

Audit noticed absence of institutionalised mechanism for Infection Control in the DHs. In the test checked DHs the Cleaning services and hygiene practices were not satisfactory to provide an assurance regarding an infection free environment to the medical staff and patients. Bio Medical Waste (BMW) was not collected on daily basis as envisaged in the BMW rules. The Staff had been trained on BMW handling in all the test-checked hospitals. The test-checked DHs of Nongpoh CH and Tura MCH did not have functional ETP for treatment of hospital effluents posing serious implications for environment and human health.

### ***Recommendations***

- i. The infection control mechanism should be embedded in hospital through proper monitoring by the HICC. Adoption of pest and rodent control measures, methods of sterilisation of OT instruments prescribed, microbiological survey; proper immunisation, medical check-up and training of staff should be ensured by the hospital administration.*
- ii. The BMW Rules should be adhered and followed rigorously to provide an infection free environment in the hospital.*
- iii. Effluent Treatment Plants may be constructed in all the hospitals. State Government needs to effectively pursue the matter of inspection of ETP at Nongpoh CH with SPCB.*

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<sup>23</sup> 43 locations as on November 2019.