

## DoD Space Planning Criteria for Health Facilities

### Labor & Delivery/Obstetric Unit

#### 4.2.1. PURPOSE AND SCOPE:

This section provides guidance for the space planning criteria for labor, delivery activities and the obstetric unit in DoD medical facilities. These units provide the facilities and services associated with birthing, the care of newborn infants and their mothers.

#### 4.2.2. DEFINITIONS:

**Average Length of Stay (ALOS):** The amount of time between arrival and departure of patient.

**Birthing Equipment Storage:** Numerous items of equipment are used during the birth of an infant. Traditionally, in the LDRP (labor, delivery, recovery, postpartum) concept, the equipment needed at the time of birth can be shared between two rooms and kept in a common equipment room/alcove. In a traditional LDR (labor, delivery, recovery) concept, an area of the room provides storage for equipment dedicated to that room. However, in both the LDR and LDRP revised concepts, equipment storage is provided in the same manner. Equipment storage for both LDRs and LDRPs is provided in a dedicated enclosed closet for each room. Additionally, there is a requirement for common storage space for equipment on the unit.

**Exam/Prep Room:** Birthing patients are initially seen and evaluated in an exam/prep (triage/pre-admission) room. This process is to determine if the patient is truly in labor and if there are any complications. The process of exam/prep can result in the patient being sent home (false labor for example), the patient being sent to a room for the labor to progress, or to a cesarean section room (high risk patient or scheduled cesarean section). Exam/prep does not always lead to an immediate admission or release. It may take a couple hours of observation to R/O active labor, fetal or maternal distress before the admission or release to home decision can be made. It is also in this area that admission data is gathered.

**High Risk Pregnancy:** This term is used to describe the state of a mother prior to delivery. A high-risk pregnancy is one in which additional health concerns are capable of complicating the natural course of a pregnancy. These conditions include an expectant mother who has had a problem pregnancy before, a current obstetrical problem such as: pre-eclampsia or placenta previa, a medical problem such as: diabetes or hypertension, a genetic problem. A woman who has a problem such as these is likely to experience a worsening of that condition as pregnancy progresses. Although pregnancy is a normal, natural state, it represents a stress on a healthy body because of changes in blood volume, hormone balance, mechanical pressures, and other conditions. For programming purposes, the number of "high risk pregnancies" can be projected from a count of those births, which were classified upon discharge into the following DRGs:

- 370 Cesarean Section with CC
- 371 Cesarean Section without CC
- 372 Vaginal Delivery with Complicating Diagnoses
- 375 Vaginal Delivery with OR procedure Except Sterilization and / or D&C

**Labor and Delivery Unit:** A nursing unit for the care of mothers and babies during labor and delivery, which can include the use of LDRs (labor, delivery, recovery), LDRPs (labor, delivery, recovery, postpartum), and/or obstetric beds.

**Labor, Delivery, and Recovery (LDR):** A maternity care program which provides labor, delivery, and recovery for a mother in a single room. Rooms must include facilities for care of the infant during delivery and immediately after birth. The use of this concept requires a postpartum or obstetric unit

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**Labor, Delivery, Recovery, and Postpartum (LDRP):** A maternity care program which provides labor, delivery, recovery, and postpartum care for mother in a single room. Rooms must include facilities for care of the infant during delivery and after birth. Such rooms also include facilities for mother-baby care.

**Low Risk Pregnancy:** This term applies to those pregnancies, which are not high risk and generally can be considered those normal deliveries which after the fact are classified into DRG 373, Vaginal Delivery without complicating diagnoses.

**Mother-Baby:** This is also described as “Rooming In” and “Mother-Infant Couplet Care.” This is when the infant stays in the same bedroom as the mother following delivery and during the infant’s and mother’s stay in the hospital. Mother and Baby may stay in an LDRP or on an Obstetrical or Postpartum Unit.

**Postpartum:** This is the period of time following birth.

**Obstetric Unit:** A postpartum or obstetric unit is the inpatient area of women following health care events associated with pregnancy. This unit may also be used for antepartum, female surgery, and other obstetric (OB) or gynecology (GYN) related patients.

**Unit:** A unit is an area of patient care that includes a number of patient rooms and all of the support functions necessary to provide care to the patients on that unit. Examples include an obstetric ward (unit), an LDR unit or an LDRP unit. The number of units varies and is provided in the formula paragraph 4.2.6.

#### **4.2.3. POLICIES:**

LDRPs will be programmed into all DoD MTFs unless average workload exceeds 250 births per month. The only exception will be for renovation projects where it is documented that the existing facility will not accommodate LDRPs. LDRPs are recommended for all DoD MTFs unless the average workload exceeds 250 births per month. Exceptions for MILCON will be considered when significant complexity of care and staffing issues exist. In addition, exceptions will be made for renovation projects where it is documented that the existing facility will not accommodate LDRPs. In these cases, the LDR concept with an obstetric unit will be programmed.

An economic analysis should be accomplished when obstetric services are included in a MILCON project to determine the desired capacity and resources. The analysis may be accomplished with in-house resources or through a commercial contract. This analysis must consider population served and future trends for that population, fertility rates in the population by segments both past and future, obstetric service staffing projections, availability and cost of obstetric services in the geographic area and concepts of care. The analysis must include the Poisson process calculation for determining required number of beds. The analysis may include a simulation evaluation that demonstrates the expected birth volume associated with the number of labor/delivery rooms proposed, given the targeted clinical practices and expected nurse staffing.

When annual births per year are projected to be less than 360 births; special justification of OB services is required. The following factors should be taken into consideration as part of the justification: (1) location (2) availability of local OB services (3) readiness/quality of life issues.

Although Public Law (Statute), “Standards Relating to Benefits for Mothers and Newborns” does not apply to DoD facilities, nor to care provided via CHAMPUS and TRICARE, the standards set forth should be followed for planning purposes. These standards state that mothers shall receive a minimum of 48 hours of inpatient care following vaginal delivery and 96 hours following cesarean section, if they so desire. The direction of this legislation is to assure that mothers, not HMOs or third party payers, have control over their minimum length of stay. In most hospitals, including DoD, the mother may elect to be discharged in less than the minimum times stated.

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#### 4.2.4. CONSIDERATION OF PROGRAMMING OPTIONS

##### Concepts of Care:

In DoD facilities, there are currently only two accepted concepts of care for the birthing of infants.

- A. The Labor Delivery Recovery (LDR) room model.
- B. The Labor Delivery Recovery Postpartum (LDRP) room model.

Renewal/renovation projects can implement LDRs if space allocation/constraints don't allow an LDRP design, or if average workload exceeds 250 births per month.

Inpatient obstetrical facility space requirements are a function of (a) birth volume and (b) provider practice patterns at the facility of interest. These items must be analyzed in detail.

- (a) The primary purpose of the birth volume analysis is to forecast the number of mothers who will give birth from the subject hospital beneficiary population during each of the next several (five) years. The analysis of birth volume must consider the current and any projected changes in the beneficiary population at risk for obstetrical services. The population at risk is generally considered to be women between the ages of 15 and 45. The analysis of the beneficiary population must include beneficiary category, single year age group and marital status. The analysis of birth volume must also consider historical and projected changes in fertility of the population at risk. The unit of analysis for the fertility rate analysis must be mothers giving birth as defined by patients discharged from DRGs 370 through 375. The fertility rate information must be beneficiary category and single-year age group specific, i.e. 18 year old, 19 year old, etc. Analysis of historical fertility rate data from the catchment area population for a period of not less than three years is necessary. This analysis should include an assessment of seasonality trends in the birth volume data.
- (b) The primary purpose of the provider practice pattern analysis is to translate the birth volume forecast into clinic and hospital workload. There are five key obstetrical practice pattern parameters that have been shown to determine inpatient obstetrical facility resource requirements. These parameters are:
  - (1) Cesarean delivery rate, DRGs 370, 371
  - (2) Cesarean delivery ALOS.
  - (3) Vaginal birth delivery rate (DRGs 372-375).
  - (4) Vaginal birth ALOS (Average Length of Stay).
  - (5) Discharge rate to non-birth related obstetrical patients (as defined by patients discharged from DRGs, 378, 379, 380, 382, 383 and 384, (376, 377 can also be used, if they were not postpartum patients).

At some locations, GYN surgical patients may be collocated with or cared for on this unit. In a women's health model the outpatient OB/GYN clinic may also be located adjacent to this unit with routine antepartum testing completed on the OB unit (due to the expertise of nursing staff and best use of resources).

If the concept of operation is to include non-birth related GYN patients on the same ward with postpartum patients, then the following practice patterns must be considered:

- (6) Non-birth related obstetrical patient ALOS.
- (7) Surgical GYN patients (DRGs 353-369), when these patients are placed on an obstetrics unit.

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- (8) Surgical GYN patients (DRGs 353-369) ALOS when these patients are placed on an obstetrics unit.

NOTE: Consideration must be given to DRGs 376 and 377 Postpartum and Post abortion Diagnoses with (377) or without (376) OR Procedure. A birth may or may not be associated. The number of discharges and the AOL of each must be captured. This is also true for the DRGs 353-369 (diseases & disorders of the female reproductive system, surgical), when these patients are placed in the obstetric unit.

Analyses of these practice pattern parameters from both institutional and an individual provider perspective is necessary. Historical performance data should be compared with normative source data. Guidance from the Chief of Obstetrics at the subject hospital should be provided regarding the target planning values for these five parameters. The target values for these five parameters should be used for inpatient obstetrical facility planning purposes.

The analysis must consider clinical practice patterns, nurse allocation, scheduling, and staffing practices.

For hospitals with less than 3,000 mothers giving birth each year (250 births per month) there is a substantial savings in nursing and support personnel associated with implementation of the LDRP concept of care and a fully cross-trained staff. For very small facilities of less than 1,800 births per year (150 births per month) the support staff savings associated with implementation of LDRP care is on the order of 20 percent. Staff savings of this magnitude can justify the entire building renovation or construction project cost. The savings cannot be realized using the LDR and postpartum concept of operations. Therefore, the LDRP model is clearly more efficient in terms of support staffing costs than the LDR care concept in hospitals with less than 3,000 births per year.

For inpatient obstetrical facilities with a forecast birth volume of less than 3,000 births per year (250 births per month), as defined by patients discharged from DRGs 370 through 375, the preferred concept of care is LDRP. For facilities with a forecast birth volume greater than 3,000 births per year the preferred concept of care is LDR with a separate postpartum unit. Exceptions to these guidelines will be made on a case-by-case basis following submission of appropriate documentation.

#### **4.2.5. PROGRAM DATA REQUIRED:**

What is the model or concept of care that will be used? (LDR, LDRP)

Will "Mother-Baby" care be provided on a 24-hour basis?

Projected annual number of births.

Projected annual percent of births that are cesarean sections (DRGs 370 & 371)

Projected Average Length of Stay (ALOS) for vaginal birth patients.

Projected Average Length of Stay (ALOS) for cesarean section patients.

Projected annual number of OB admissions that are for each of the following DRGs:

376 & 377(separate DRGs 376 & 377 into birth related and non-birth related), 378, 379, 380, 381, 382, 383 & 384.

Projected annual number of Surgical GYN patients when these patients are kept on the obstetric unit. (DRGs 353-369) and associated ALOS for each DRG.

Average occupancy rate for LDRs, based on Poisson process or historical information.

Average occupancy rate for LDRPs, based on Poisson process or historical information.

Projected number of infants on an LDRP unit.

Maximum number of obstetricians who require sleeping space at one time.

Peak FTEs on a shift for Labor & Delivery, and Postpartum areas distributed by sex.

Total number of FTE for Labor & Delivery, and Postpartum areas distributed by sex.

Projected female population in the hospital catchment area of child-bearing age.

Projected fertility rate of population supported.

Will the OB/GYN clinic be colocated with the inpatient obstetrics unit and will routine

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antepartum testing be completed on this unit?

Projected number of routine antepartum tests?

Will other GYN patients be cared for on this unit?

#### Diagnostic Related Groups for this section:

- 353 Pelvic Evisceration, Radical Hysterectomy and Radical Vulvectomy
- 354 Uterine and Adnexa Procedures for Nonovarian/Adnexal Malignancy with CC
- 355 Uterine and Adnexa Procedures for Nonovarian/Adnexal Malignancy without CC
- 356 Female Reproductive System Reconstructive Procedures
- 357 Female Reproductive System Reconstructive Procedures for Ovarian or Adnexal Malignancy
- 358 Uterine and Adnexa Procedures for Nonmalignancy with CC
- 359 Uterine and Adenexa Procedures for Nonmalignancy without CC
- 360 Vagina, Cervix and Vulva Procedures
- 361 Laparoscopy and Incisional Tubal Interruption
- 362 Endoscopic Tubal Interruption
- 363 D and C, Conization and Radioimplant for Malignancy
- 364 D and C, Conization Except for Malignancy
- 365 Other Female Reproductive System OR Procedures
- 366 Malignancy of Female Reproductive System with CC
- 367 Malignancy of Female Reproductive System without CC
- 368 Infections of Female Reproductive System
- 369 Menstrual and Other Female Reproductive System Disorders
- 370 Cesarean Section with CC
- 371 Cesarean Section without CC
- 372 Vaginal Delivery with Complicating Diagnoses
- 373 Vaginal Delivery without Complicating Diagnoses
- 374 Vaginal Delivery with Sterilization and/or D and C
- 375 Vaginal Delivery with OR Procedure Except Sterilization and/or D and C
- 376 Postpartum and Post abortion Diagnoses without OR Procedure
- 377 Postpartum and Post abortion Diagnoses with OR Procedure
- 378 Ectopic Pregnancy
- 379 Threatened Abortion
- 380 Abortion without D and C
- 381 Abortion with D and C, Aspiration Curettage or Hysterotomy
- 382 False Labor
- 383 Other Antepartum Diagnoses with Medical Complications
- 384 Other Anteparum Diagnoses without Medical Complications

**NOTE: GP indicates that a guideplate exists for that particular Room Code.**

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**4.2.6. SPACE CRITERIA:**

FUNCTION	Room Code	AUTHORIZED		PLANNING RANGE/COMMENTS
		m <sup>2</sup>	nsf	

**LDR/LDRP**

Labor/Delivery/Recovery (LDR) Room (incl. equip. storage and circulation areas) (GP)	LDRP1	36.23	390	Narrow. See formula in para. 4.2.7 to determine quantity of rooms. –One for isolation
	LDRP2			Wide. Wide is preferred. See formula in para. 4.2.7 to determine quantity of rooms.
Labor/Delivery/Recovery Isolation	LDRP3	36.23	390	One per Unit
Dedicated LDR/LDRP Toilet/Shower	TLTS2	5.57	60	One per LDR/LDRP Room.
Dedicated LDR/LRP Equipment Storage	SRE01	4.65	50	One per LDR/LDRP Room.

<b>LDR &amp; LDRP ASSOCIATED FUNCTIONS</b>	<b>The following provides function, which support and are common to both the LDR and the LDRP concepts of operation.</b>
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Nurse Station	NSTA1	13.94	150	Minimum, One per Labor & Delivery Unit, Add 30 nsf per LDR/LDRP 400 nsf max.
Medication Preparation	MEDP1	9.29	100	One per L&D unit.
Nourishment Room (GP)	NCWD1	9.29	100	One per L&D unit.
Exam/Prep Room (GP)	LDEP1	14.86	160	One per each 1,000 total projected annual births.
Exam/Prep Room Toilet (GP)	TLTU1	4.65	50	One per each Exam/Prep Room.
Early Labor Lounge	WRC01	22.30	240	One per L & D Unit.
Antepartum Testing (NST) Room	LDAT1	29.73	320	Minimum one per L & D unit. Provides two cubicles and workstation. Add 120nsf for every 100 average monthly births over 100.
Antepartum Testing Toilet (GP)	TLTU1	4.65	50	One per L & D unit..
Anesthesia Workroom	ORCW1	11.15	120	One per L & D unit. Can be located in the C-Section functional area.
Anesthesia Storage	SRSE1	3.72	40	When also supporting 10 or more LDRs and/or LDRPs.
Nursery Observation (GP)	NYNN1	14.68	160	Minimum, for 10 or less LDR/LDRP beds. Includes two bassinets, infant care center, and workstation. Increase 10 nsf per bed over 10 LDR/LDRP beds. Maximum 260 nsf
Nursery Isolation (GP)	NYIR1	9.29	100	One per LDR/LDRP unit. Can be located in Postpartum unit.

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FUNCTION	Room Code	AUTHORIZED		PLANNING RANGE/COMMENTS
		m <sup>2</sup>	nsf	

<b>C-SECTION AREA</b>	<b>These are functions, which are necessary for any hospital that provides obstetric services. Note that some hospitals may provide these functions in the operating suite.</b>			
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Area Control Station	NSTA3	5.57	60	One per C-Section area, co-locate with Recovery Room.
Cesarean Birth Room (GP)	LDDR1	37.16	400	See formula in para. 4.2.7.
Recovery Room (GP)	RRSS1	22.30	240	Minimum 2-bed recovery room for one cesarean section room. Add 240 nsf for each additional cesarean section room, i.e. two recovery beds for each cesarean birthing room.
Scrub / Gown Area (GP)	ORSA1	6.50	70	One per every two cesarean birth rooms.
Sterile Supply	ORSS1	9.29	100	One per every four or fraction of four cesarean birth rooms.
Equipment Cleanup / Soiled Utility	OREC1	7.43	80	One per every four or fraction of four cesarean birth rooms.
Anesthesia Workroom	ORCW1	11.15	120	One per C-Section area.
Anesthesia Storage	SRSE1	9.29	100	One per C-Section area.
Medical Gas Storage	SRGC2	4.65	50	One per C-Section area.
Dedicated Janitor Closet	JANC1	3.72	40	One per C-Section area. See Section 6.1.

<b>L&amp;D PATIENT/FAMILY AREAS</b>	<b>Supports all Labor and Delivery (L&amp;D) areas, except Postpartum Unit.</b>			
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Waiting Room	WRF01	11.15	120	Minimum. 20 nsf per LDR or LDRP.
Waiting Room Toilet (GP)	TLTU1	4.65	50	One per L&D Unit.
Vending Area	BX001	3.72	40	One per L&D Unit
Consultation Room (GP-Phase III)	OFDC2	11.15	120	One per L&D unit.
Teaching Room	NYPT1	11.15	120	Minimum. 20 nsf per LDRP. If LDR in clinic concept of operation, this function should be placed on the Postpartum Unit.

<b>L&amp;D STAFF AND ADMINISTRATIVE AREAS</b>	<b>Supports all Labor and Delivery (L&amp;D) areas, except Postpartum Unit.</b>			
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NCOIC/LCPO/LPO/SMT Office	OFA01	11.15	120	Private office, Standard Furniture. One per L&D unit.
	OFA02			Private office, System Furniture. One per L&D unit.
Nurse Supervisor Office	OFA01	11.15	120	One per L&D unit.
	OFA02			
Physician Charting / Dictation	WRCH1	7.43	80	One per L&D unit. Greater than 10 beds add 40 nsf
Conference/Report Room (GP)	CRA01	23.23	250	One per L&D unit.

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FUNCTION	Room Code	AUTHORIZED		PLANNING RANGE/COMMENTS
		m <sup>2</sup>	nsf	
Staff Changing Locker Room (GP)	LR002	9.29	100	Minimum. Add 7 nsf for each FTE on peak shift over eight. Divide space evenly for male/female locker rooms.
Staff Shower Area (GP)	SHWR1	5.57	60	Minimum. provides for one shower. Increase by one additional shower for every 15 FTE (on peak shift) greater than 15.
Staff Lounge (GP)	SL001	13.01	140	Minimum. See Section 6.1.
Staff Toilets	TLTU1		Varies	See Section 6.1.
On-Call Room (GP)	DUTY1	11.15	120	One per projected "on-call" staff member per shift required to sleep in the unit.
On-Call Toilet/Shower	TLTS1	5.57	60	One per On-Call Sleeping Room.

**L&D SUPPORT AREAS**

Clean Supply (GP)	UCCL1	16.72	180	One per each 1,000 project annual births.
Soiled Utility (GP)	USCL1	13.94	150	One per L&D unit.
Trash and Linen Collection	UTLC1	11.15	120	One per L&D unit.
Stretcher/Wheelchair Storage	SRLW1	7.43	80	One per L&D unit.
Equipment Storage	SRE01	5.57	60	Minimum. 15 nsf for each LDRP/LDR. In addition to in-room storage.

**Obstetrics Unit (Postpartum/Antepartum):**

**NOTE: This may be a small area in a unit that has solely LDRPs..**

**POSTPARTUM/ANTEPARTUM AREAS**

Single Patient Room (GP-Phase III)	BRMS1	22.30	240	See formula in para.4.2.7 (postpartum).
Double Patient Room (GP-Phase III)	BRMS2	29.73	320	Pairs of single patient rooms can be converted into double patient rooms during design.
Isolation Patient Room	BRIT1	22.30	240	One per Postpartum/Antepartum Unit
Dedicated Patient Toilet/Shower	TLTS2	5.57	60	One per each postpartum room
Nurse Station (GP-Phase III)	NSTA1	13.94	150	Minimum if stand alone unit up to 12 beds. Add 10 nsf per bed over 12, max 300 nsf.
Medication Preparation (GP-Phase III)	MEDP1	7.43	80	One per postpartum unit.
Family Teaching Room	NYPT1	11.15	120	Minimum of 120 nsf, 20 nsf per LDR. If LDRP in clinic concept of operation, then this function should be placed on the LDRP unit. (This room should be larger if there is no Level II or III nursery, which has a large classroom.)
Treatment Room	TROB1	16.26	175	One per postpartum unit.
Public Toilet	TLTU1	4.65	50	One per postpartum unit.
Patient Lounge	DAYR1	18.58	200	One per postpartum unit.

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FUNCTION	Room Code	AUTHORIZED		PLANNING RANGE/COMMENTS
		m <sup>2</sup>	nsf	

**POSTPARTUM STAFF AND ADMINISTRATIVE AREAS**

Nurse Supervisor Office	OFA01	11.15	120	One per postpartum unit.
	OFA02			One per postpartum unit.
NCOIC/LCPO/LPO/SMT Office	OFA01	11.15	120	One per postpartum unit.
	OFA02			
Nurse Workroom	WRCH1	9.29	100	Minimum, One per postpartum unit. Greater than 10 beds add 40 nsf
Physician Charting/Dictation	WRCH1	7.43	80	Minimum. One per postpartum unit. Greater than 10 beds add 40 nsf
Clinical Specialist/Lactation Support Office (GP)	OFD01	11.15	120	One per postpartum unit.
Nourishment Room (GP)	NCWD1	11.15	120	One per postpartum unit.
Staff Toilet	TLTU1		varies	See Section 6.1.
Personal Property Lockers (GP)	LR001	1.86	20	For staff without a dedicated office/cubicle space. Consolidate Locker requirements with L&D Unit if co-located with L&D area. See criteria above. (See Section 6.1)

**POSTPARTUM SUPPORT AREAS**

Clean Supply (GP)	UCCL1	14.86	160	One per postpartum unit.
Soiled Utility (GP)	USCL1	11.15	120	One per postpartum unit
Trash and Linen Collection	UTLC1	11.15	120	One per postpartum unit.
Nursery Transport Unit Alcove	NYTU1	1.86	20	One per postpartum u nit
Stretcher/Wheelchair Storage	SRLW1	5.57	60	One per postpartum unit.
Equipment Storage	SRE01	5.57	60	Minimum. 10 nsf of storage per each obstetric room.
Communication Room	COMC1	10.22	110	One communication closet per 10,000 nsf. See Section 2.4.
Janitor Closet	JANC1	3.72	40	One janitors' closet per 10,000 nsf. See Section 6.1.

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#### 4.2.7. FORMULAS:

**Discussion.** The vast majority of patients arriving at a hospital in need of obstetrical care are not scheduled in advance. Rather, these patients arrive in an unscheduled or random way (scheduled cesarean deliveries and scheduled induction patients are exceptions that do not arrive at the hospital randomly). A great deal of work has been done on the mathematics of random processes. Queuing theory, for example, is a branch of mathematics that studies people waiting in lines or queues. The mathematical model, the Poisson process, has been used to accurately describe many random processes. The Poisson process has been shown to accurately describe obstetrical facility occupancy in a number of studies dating from 1960.

There are two required inputs to the Poisson process, the arrival rate (admission rate) and the service time (average length of stay - ALOS). The Poisson process assumes that admissions are random events with respect to day of week and time of day. If a significant proportion of admissions are scheduled, use of the Poisson process will overestimate the requirements for rooms and beds. Therefore, the Poisson process should be considered a conservative estimate (overestimate) of room and bed needs.

The Poisson process calculates the occupancy rate and probability that a bed will not be available (patient turn-aways). The calculation of this probability explicitly illustrates the trade-off between desired occupancy rate and the probability that a bed will not be available. There is no consensus on the “right” level that demand exceeds the facility capacity (percent of patient turn-aways). Estimates of the appropriate demand level for planning purposes range from 90 to 99.9 percent. The determination of the trade-off between occupancy rate and turn-away probability is a responsibility of the facility planners. The ability of the facility to accommodate patients in other rooms in the obstetrical unit or in other hospital units for short periods or to limit the number of scheduled procedures during periods of peak demand are important considerations when making this decision.

Normative formulas are provided below for the purpose of both quick and comparative program development. The Poisson process will be used to provide the accepted quantity solutions. An example Poisson distribution example is provided following the formulas. An interactive, electronic spreadsheet which graphs this distribution is available on the website <http://www.tricare.osd.mil/ebc/rm>.

Common Planning Factors: Actual experience rates are more desirable and should be obtained from the historic workload for the facility. The following factors are provided for comparative purposes.

Minimum mother’s ALOS for normal vaginal birth = 2.0 days  
 Minimum mother’s ALOS for cesarean section birth = 4.0 days  
 Infant’s ALOS for a normal vaginal birth = 1.5 days  
 Infant’s ALOS for Cesarean Birth = 3.5 days  
 Cesarean Birthrate is 20% nationally

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#### Formula for LDRs:

$$\text{Total number of LDRs} = \frac{\text{Projected LDR Events Number} \times \text{ALOS}}{365 \times \text{desired percentage occupancy}}$$

Note: A rule of thumb is that LDRs are provided at a ratio of one per 350 non-cesarean births. The above formula is more precise.

Cesarean Section Births are DRGs 370 and 371.

Normal Deliveries are DRGs 372, 373, 374 and 375.

Note: DRG 375 may require additional review since it is described as a vaginal delivery with OR procedure except sterilization and/or D&C.

- Step 1. Determine the projected number of LDR events, which equals the number of vaginal births (project the annual number of births minus the annual projected number of cesarean births).
- Step 2: Add to this the number of cesarean births less the number of “scheduled cesarean births.” The purpose of adding the unscheduled C-sections is to provide LDR space for the woman who goes to an LDR room to attempt vaginal delivery and after some period of labor time, is taken to an operating room for an emergency cesarean section
- Step 3. Project the Average Length of Stay in an LDR for a normal vaginal birth. This number on average is 0.5 days or 12 hours (6-hrs. labor, 2-hrs. delivery, 3-hrs. recovery and 1 hr. room cleanup). A description of how to determine ALOS by DRG is provided at the end of this section.
- Step 4. Determine the desired percentage of occupancy in the LDRs. The most widely used number in the private sector is 70% or 0.70.
- Step 5. Insert the numbers attained in steps one through three into the formula and calculate the number of LDRs required.

#### Formula for LDRPs:

$$\text{Total number of LDRPs} = \frac{\text{Projected LDRP Events} \times \text{ALOS}}{365 \times \text{desired percentage occupancy}}$$

Note: There is no difference in the LDR and the LDRP formulas. The results are different because of different variables, most notably the ALOS (average length of stay).

- Step 1. Determine the projected number of LDRP events, which equals the number of vaginal births (project the annual number of births minus the annual projected number of cesarean births).
- Step 2. Project the Average Length of Stay in an LDRP for a normal vaginal birth. This number on average is 2 days. A description of how to determine ALOS by DRG is provided at the end of this section.
- Step 3. Determine the desired percentage of occupancy in the LDRP unit. The most widely used number in the private sector is 70% or .70.
- Step 4. Insert the numbers attained in steps one through three into the formula and calculate the number of LDRPs required.

## DoD Space Planning Criteria for Health Facilities

### Labor & Delivery/Obstetric Unit

#### Formula for Cesarean Room:

$$\text{Total number of Cesarean Rooms} = \frac{\text{Projected \# of Annual Cesarean Births}}{500 \text{ births per room}}$$

- Step 1. Project the number of annual cesarean births. A rule of thumb is that 20% of all births will be cesarean, however there is considerable variation between hospitals.
- Step 2. Divide the projected number of cesarean births by 500 to determine the total number of cesarean rooms required. Always round up to the next highest number. The minimum number of rooms must be one.

Note: **In smaller facilities, the Cesarean Room(s) may be located in the Surgical Suite, if it is near the Obstetric Unit.**

$$\text{Number of Postpartum Beds} = \frac{\text{Projected number of Annual Births} \times \text{Projected ALOS}}{365 \times \text{Planned Occupancy Rate}}$$

Note: Postpartum beds are not required in a unit with a solely LDRP service. An obstetrics unit may also be provided in a hospital with a very large OB service (250 or more births per month). In this case, a special study is needed using a Poisson process to determine beds needed.

This formula will need to be calculated twice: once for projected low-risk births using the lower ALOS and then again for the projected number of high-risk births using the high risk ALOS.

- Step 1. Determine the projected number of annual births, low risk and then high risk. (see definitions for DRGs in each category.)
- Step 2. Project the Average Length of Stay in the obstetric unit. This number on average is 1.5 days for low risk patients and 3.5 days for high-risk patients. A description of how to determine ALOS by DRG is provided at the end of this section.
- Step 3. Determine the desired percentage of occupancy in the obstetric unit. The most widely used number in the private sector is 70% or .70.
- Step 4. Insert the numbers attained in steps one through three into the formula and calculate the number of obstetric beds required.
- Step 5. Calculate the formula twice, once for the projected number of low risk births and once for the projected number of high-risk patients. Add the resulting number of beds from each calculation to determine the total number of obstetric beds required.

## DoD Space Planning Criteria for Health Facilities

### Labor & Delivery/Obstetric Unit

Number of other OB/GYN beds required =  $\frac{\text{projected number of patients in each DRG} \times \text{ALOS for the DRG}}{365}$

- Note: Other OB beds are for DRGs 376, 377 (except those following delivery), 378, 379, 380, 381, 382, 383 & 384. What about all the GYN DRGs (353-369)?
- Step 1. Determine the projected number of admissions from the above DRGs.
- Step 2. Project the Average Length of Stay in the obstetric unit for each DRG. A description of how to determine ALOS by DRG is provided at the end of this section.
- Step 3. Insert the paired numbers (patients by DRG and ALOS by DRG) attained in steps one and two into the formula and calculate the number of postpartum beds required for each DRG.
- Step 4. Calculate the formula nine times, once for each DRG. Add the resulting number of beds from each calculation to determine the total number of other OB beds required.

Number of Units (LDR, LDRP or Obstetric Unit).

Matrix shows the number of units based on the numbers of patient rooms or beds.

Number of Units	1	2	3	4	5
Obstetric	< 23	23-44	45-66	67-88	89-110
LDR	< 13	13-24	25-36	37-48	49-60
LDRP	< 19	19-36	37-54	55-72	73-90

Average Length of Stay (ALOS) is available through at least two sources.

Analysts with access to Standard Inpatient Data Records (SIDRs), the biometric records describing an individual disposition, can sum bed days by DRG and divide by dispositions. SIDRs are available on the IBM mainframe computer at Ft. Detrick in the MHS Data Repository (MDR) files and are based on SIDRs generated at individual MTFs.

Analysts with access to the All Region Server (ARS) Bridge can view individual SIDR records there and using the Business Objects software intrinsic to the Bridge, can calculate ALOS by DRG. As of January 2001, the Bridge has been in a developmental mode with limited access but is moving to a production format with greatly increased access, including authorization for at least one analyst per MTF.

Both of the above methods calculate ALOS "on the fly" rather than accessing a pre-calculated value; thus they can be developed by DRG or by any other grouping, e.g. by MEPR code.

A third option providing less detail is calculation through the MEPRS Executive Query System (MEQS). MEQS is a Business Objects based system containing expense and workload data for MTFs according to categories of interest for expense/accounting rather than workload purposes. Using occupied bed day and disposition data available here, one could calculate ALOS by MEPR code or site. ALOS by DRG could not be calculated using MEQS data.