

## Assignment 2: *Shouldice Hospital*

Read the *Shouldice Hospital – A Cut Above* case, and answer the following questions. Ignore questions in the book, but exhibit 5.7 is informative.

**Assumptions.** The purpose of our analysis is to determine the capacity, throughput, and resource utilization of the current and future operations of the Shouldice Hospital. Make the following assumptions about current operations at Shouldice:

- (a) There are no weekend (Saturday and Sunday) operations.
- (b) The hospital admits 30 patients per day on Sunday, Monday, Tuesday, Wednesday, and Thursday.
- (c) Each surgeon can operate on four patients per day, and there are 12 surgeons who work at Shouldice hospital.
- (d) Each operation takes one hour in the operating room, and each of the five operating rooms can be used from 7:30 am till 3:30 pm.
- (e) The Shouldice Hospital has 90 beds.
- (f) The Shouldice Hospital is committed to a **three-day** process.
- (g) All the other resources have sufficient capacity.

### Questions:

1. Consider the linear flow chart consisting the following three steps: (i) Pre-surgery examination, orientation, etc., (ii) Surgery, and (iii) Recovery.

(a) What is the flow unit?

2. Answer the following questions.

(a) What is the weekly throughput rate of the hospital?

(b) What is the average bed utilization?

(c) How many patients will be in the hospital during each day of the week? Draw an inventory build-up diagram with days of the week plotted on the horizontal axis and number of patients plotted on the vertical axis.

3. The vice president of the hospital wants to increase the throughput rate of the hospital. He has a target of increasing the weekly throughput rate by 20% (as compared to the throughput rate of Question 2(a)). One option to increase throughput is to add Saturday operations (i.e., admit 30 patients on Friday for Saturday operation, while still maintaining 30 operations from Monday to Friday).

(a) What is the average bed utilization?

4. The surgeons and other hospital unions reject the idea of having Saturday operations. The vice president is determined to increase the throughput rate by 20% without changing the Shouldice practice (i.e., each surgeon still can operate on four patients per day; each operation still takes one hour; operating rooms can be used from 7:30 am till 3:30 pm; the hospital committed to three-day process).

(a) Without adding more resource and changing the current Shouldice practice, what is the maximum throughput rate that can be achieved? (only relax assumption (b))

(b) The management of Shouldice is thinking of expanding the hospital's capacity to serve considerable unsatisfied demand. To this effect, the vice president seriously considers adding another floor of rooms to the hospital, increasing the number of beds by 50%. What is the maximum throughput rate that can be achieved? (only assumptions (b) and (e) are relaxed) Do you have any comments on this consideration?

(c) Suggest a plan to increase the throughput rate of the hospital by 20% while maintaining five-day operations and adding as few additional resources as possible (try to be creative and remember that healthcare resources are expensive!), (assumptions (b)-(e) may be relaxed).