A number of notable features in Shouldice's service delivery system contribute to its success:(1)Shouldice accepts only patients with uncomplicated external her- nias,and uses a superior technique developed for this type of hernia by Dr.Shouldice during World War II.(2)Patients are subject to early ambulation, which pro- motes healing.(Patients literally walk off the operating table and engage in light exercise throughout their stay, which lasts only three days.)(3)Its country club atmosphere, gregarious nursing staff, and built-in socializing make a surprisingly pleasant experience out of an inherently unpleasant medical problem. Regular times are set aside for tea, cookies, and socializing. All patients are paired up with a roommate with a similar background and interests.

The Production System

The Production System The medical facilities at Shouldice consist of five operating rooms, a patient recovery room, a laboratory, and six examination rooms. Shouldice performs, on average, 150 operations per week, with patients generally staying at the hospital for three days. Although operations are performed only five days a week ,the remainder of the hospital is in operation continuously to attend to recovering patients. An operation at Shouldice Hospital is performed by one of the 12 full-time surgeons, and assisted by one of seven part-time assistant surgeons. Surgeons generally take about one hour to prepare for and perform each hernia operation, and they operate on four patients per day. The surgeons'day ends at 4 P.M., although they can expect to be on call every 14th night and every 10th weekend.

Each patient undergoes a screening exam prior to setuing a date for his or her operation.Patients in the Toronto area are encouraged to walk in for the diagnosis.Exami- nations are done between 9 A.M.and 3:30 P.M.Monday through Friday,and between 10 A.M.and 2 P.M.on Sat- urday.Out-of-town patients are mailed a medical infor- mation questionnaire (also available over the Internet), which is used for the diagnosis.A small percentage of the patients who are overweight or otherwise represent an undue medical risk are refused treatment.The remaining patients receive confirmation cards with the scheduled dates for their operations.A patient's folder is transferred to the reception desk once an arrival date is confirmed. Patients arrive at the clinic between 1 and 3 P.M.the day before their surgery.After a short wait,they receive a brief preoperative examination.They are then sent to an admissions clerk to complete any necessary paperwork. Patients are next directed to one of the two nurses'sta- tions for blood and urine tests and then are shown to their rooms.They spend the remaining time before orienta- tion s getting settled and acquainting themselves with their roommates.

Orientation begins at 5 r PM.,followed by dinner in the common dining room.Later in the evening,at 9 P.M., patients s gather in the lounge area for tea and cookies. Here,new patients can talk with patients who have already had their surgery.Bedtime is between 9:30 and 10 P.M. On the day of the operation,patients with early opera- tions are awakened at 5:30 A.M.for preoperative sedation. The first operations begin at 7:30 A.M.Shortly before an operation starts,the patient is administered a local anes- thetic,leaving him or her alert and fully aware of the pro- ceedings.At the conclusion of the operation,the patient is invited to walk from the operating table to a nearby wheelchair,which is waiting to return the patient to his or her room.After a brief period of rest,the patient is encouraged to get up and start exercising.By 9 P.M.that day,he or she is in the lounge having cookies and tea and talking with new,incoming patients. The skin clips holding the incision together are loos- ened,and some even removed,the next day.The remain- der are removed the following morning just before the patient is discharged. When Shouldice Hospital started,the average hospi- tal stay for hernia surgery was three weeks.Today,many institutions push"same day surgery"for a variety of rea- sons.Shouldice Hospital firmly believes that this is not in the best interests of patients and is committed to its three-day process.Shouldice's postoperative rehabilita- tion program is designed to enable the patient to resume normal activities with minimal interruption and discom- fort.Shouldice patients frequently return to work in a few days;the average total time off is eight days."It is interesting to note that approximately 1 out of every 100 Shouldice patients is a medical doctor."

Future Plans The management of Shouldice is thinking of expanding the hospital's capacity to serve considerable unsatisfied demand.To this effect,the vice president is seriously considering two options.The first involves adding one more day of operations (Saturday)to the existing five- day schedule,which would increase capacity by 20 per- cent.The second option is to add another floor of rooms to the hospital,increasing the number of beds by 50 per- cent.This would require more aggressive scheduling of the operating rooms. The administrator of the hospital,however,is con- cerned about maintaining control over the quality of the service delivered.He thinks the facility is already getting very good utilization.The doctors and the staff are happy with their jobs,and the patients are satisfied with the service.According to him,further expansion of capacity might make it hard to maintain the same kind of working relationships and attitudes.

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.