



**NYU**

**LEONARD N. STERN  
SCHOOL OF BUSINESS**

**Operations Management • Professor Juran**

## Milford Primary Care (A)<sup>1</sup>

The Physician Practice provides elective outpatient services in one specialty. The practice has one physician, one RN, one MA and one receptionist. The waiting room has plenty of capacity, and the practice has plenty of examination rooms.

Patients arrive randomly at the rate of 5 per hour (one every 12 minutes, on the average). Patients are welcomed and registered by the registrar. Registration takes an average of 5 minutes.

The patient then goes to an exam room for initial evaluation by the MA. If the MA is busy, the patient waits in the waiting room until the MA is ready. The MA spends an average of 7 minutes with each patient.

The patient then goes to another exam room for examination by the MD. If the MD is busy, the patient waits in the waiting room until the MD is ready. The MD spends an average of 10 minutes with each patient.

60% of patients require no further services after the MD is finished. They check out at the registrar (taking a negligible amount of time) and leave the office.

The other 40% of the patients require an intervention by the RN. If the RN is busy, the patient waits in the waiting room until the RN is ready. The RN spends an average of 15 minutes with each patient.

---

<sup>1</sup> Simon Samaha (MBA'04) and David Juran

Ignore any randomness in the arrival patterns of the patients and in the service times.

- a) Construct a flow diagram of this process.

b) Calculate the capacity for the registrar, MA, MD, and RN. How many patients can each of them serve in an average hour?

c) Calculate how many hours in the 10-hour day that the registrar, MA, MD, and RN are actually busy with patients.

d) Calculate the average utilization for the Receptionist, MA, MD, and RN.

e) Who is the bottleneck here? Why is that important?

f) How long does the average patient spend at the clinic?