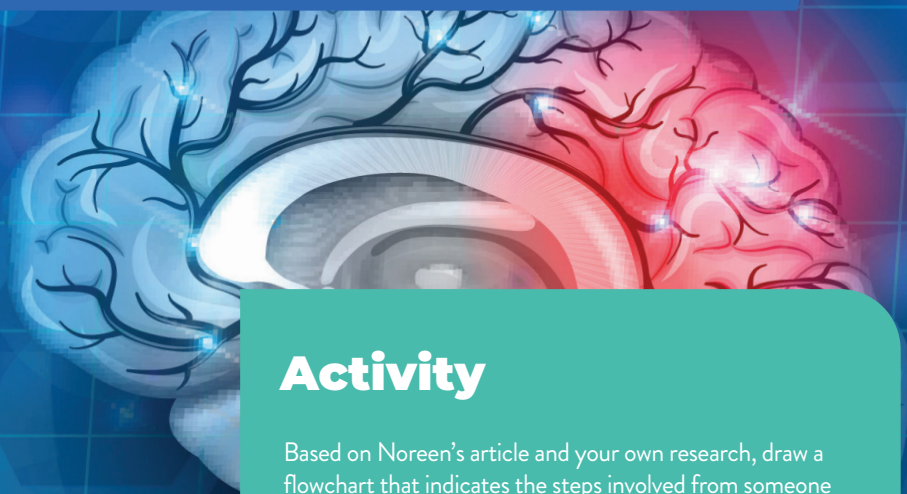
Industrial engineering

with Dr Noreen Kamal



Talking *points*

Knowledge & Comprehension

1. What is the difference between an ischemic and a haemorrhagic stroke?
2. What is an endovascular thrombectomy (EVT)?
3. Why is it important for stroke patients to receive treatment as soon as possible?
4. What is 'door-in-door-out' time?
5. How can the OPTIMISING ACCESS registry improve door-in-door-out time for stroke patients?

Application

6. Approvals from provinces to collect data on stroke patients and treatments includes "agreements on privacy, ethics and data sharing". Why do you think the approvals need to involve agreements on these three areas?
7. How might industrial engineers be able to use their skills to optimise the following?
   - Manufacturing plants
   - Electricity grids
   - Public transport networks

Analysis

8. What factors do you think might currently be causing the two-hour average door-in-door-out time for stroke patients at peripheral stroke centres? How could these factors be addressed?
9. Rural populations in Canada tend to have a slightly lower life expectancy than urban populations in Canada. What factors do you think contribute to this?

Evaluation

10. How do you think the increasing use of artificial intelligence will change the type of work that industrial engineers do?
11. A "systematic approach to healthcare" usually involves sharing patient data in larger networks. What do you think are the risks involved in this, and how might they be mitigated?

Activity

Based on Noreen's article and your own research, draw a flowchart that indicates the steps involved from someone suffering a suspected stroke to receiving appropriate treatment.

Your flowchart should address the following questions:

- Which different locations are involved?
- How does the patient travel between locations?
- How does information travel between locations and between medical staff?
- How/where does triage happen? (Triage is the preliminary assessment of patients to determine the urgency of their need for treatment.)
- How/where does the patient get diagnosed?
- How/when do medical staff decide on the optimal treatment?

Once you have built your flowchart, consider the following:

- Which steps look different for rural and urban patients?
- What are the limitations in the system? What would be better in a perfect system?
- Which parts of the system do you think involve industrial engineers?
- Where can industrial engineers best use their abilities to improve the system?
- If you were an industrial engineer, which limitation in the system would you be most interested in addressing, and why?

More *resources*

- In this video from the Royal Society of Canada, Noreen talks more about her work and its impacts: **youtube.com/watch?v=RXhFZZCFLmI**
- This video from the Department of Industrial and Systems Engineering in Texas A&M University College of Engineering provides a useful introduction to industrial engineering and the opportunities for professionals in the area: **youtube.com/watch?v=5twpa1xmlJ0**