LifeStream

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The Challenge

The COVID-19 pandemic has **significantly** impacted our healthcare system, resulting in a **higher number of hospitalized patients**. This is concerning due to limited resources and the risk imposed on frontline workers.

"The numbers of patients that are hitting the hospital, particularly the intensive care units (ICU), is at a level that I have never seen before in 10 years of practice,"

– Dr. Daniel Niven, an ICU physician in Calgary

How can we leverage data and technology to support frontline workers during the pandemic?

Background

An **ADT** (**Admission, Discharge, Transfer**) is a system used to communicate a patient's admission, discharge, or transfer status from hospitals.

ADT information also includes a patient's contact information, medical history, and is used by healthcare providers to ensure that patients receive adequate care across multiple healthcare institutions.

Currently, the response time in receiving ADT notifications is lacking, causing delays in communication at the expense of patient health.
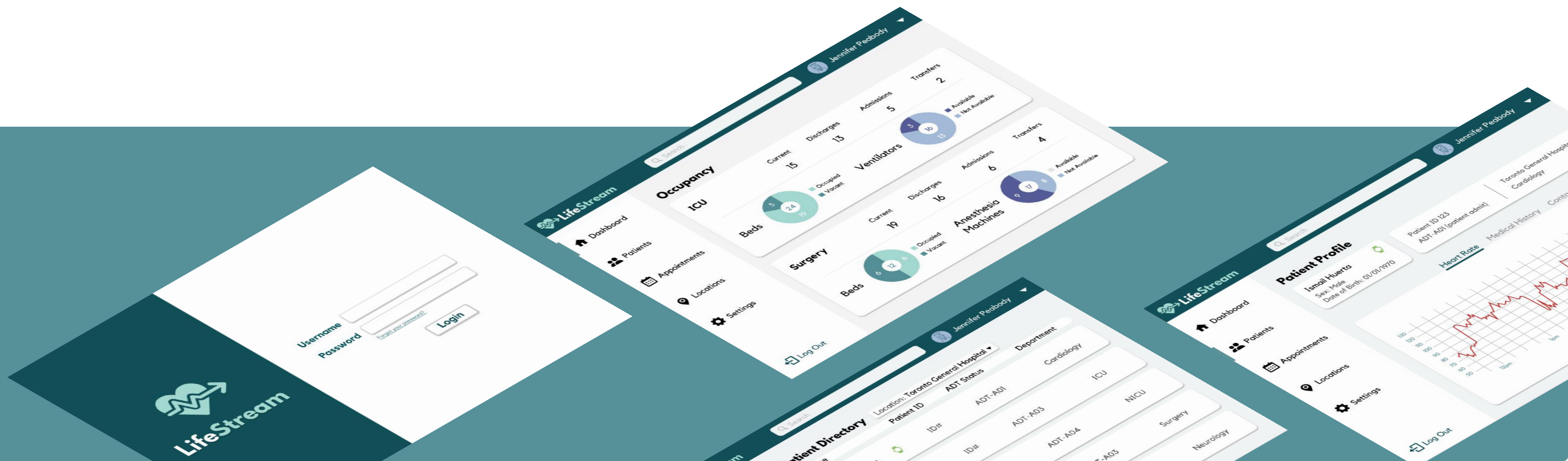
Goal

To improve patient care during the COVID-19 pandemic by facilitating better patient management and communication within and between hospitals.
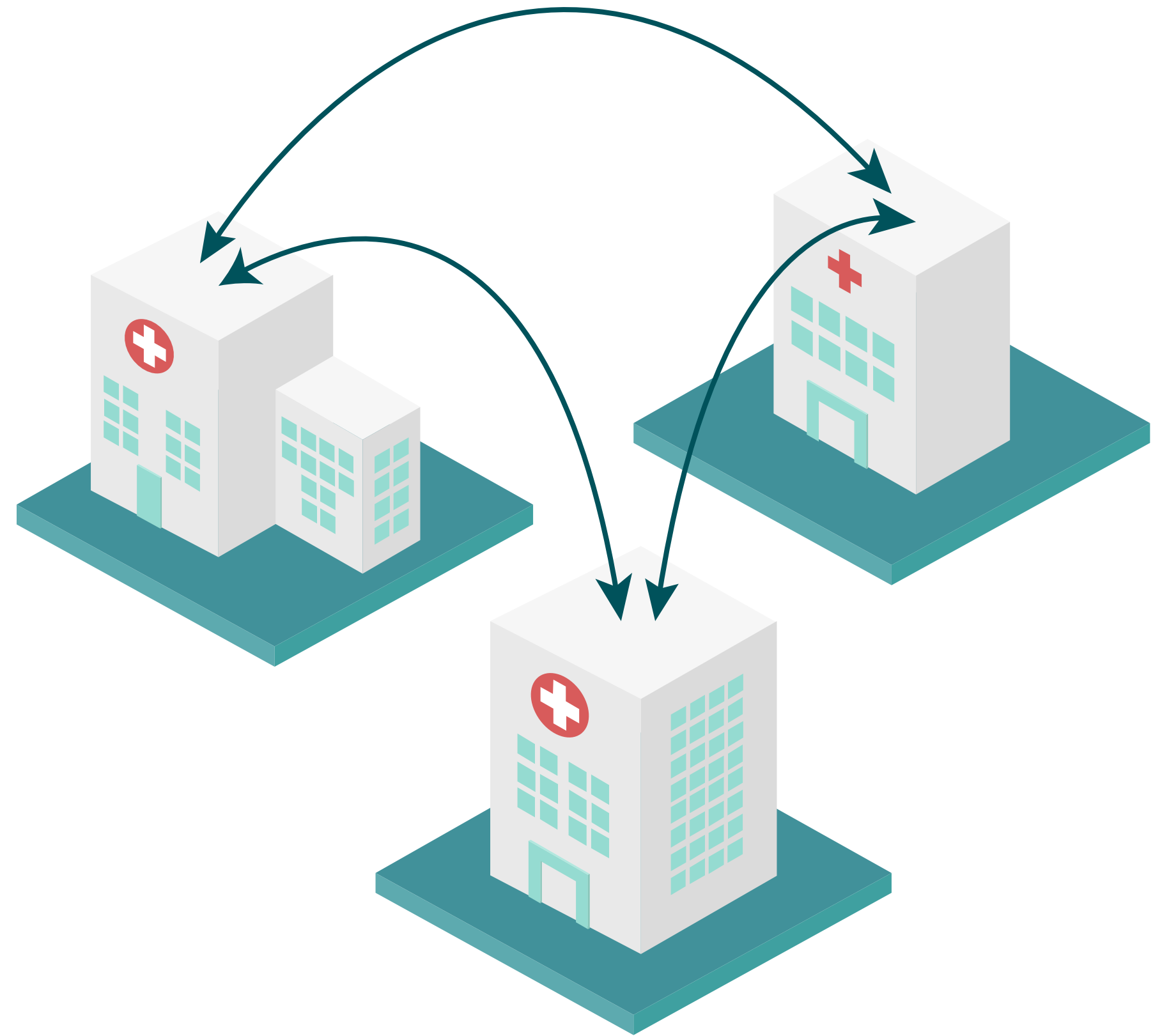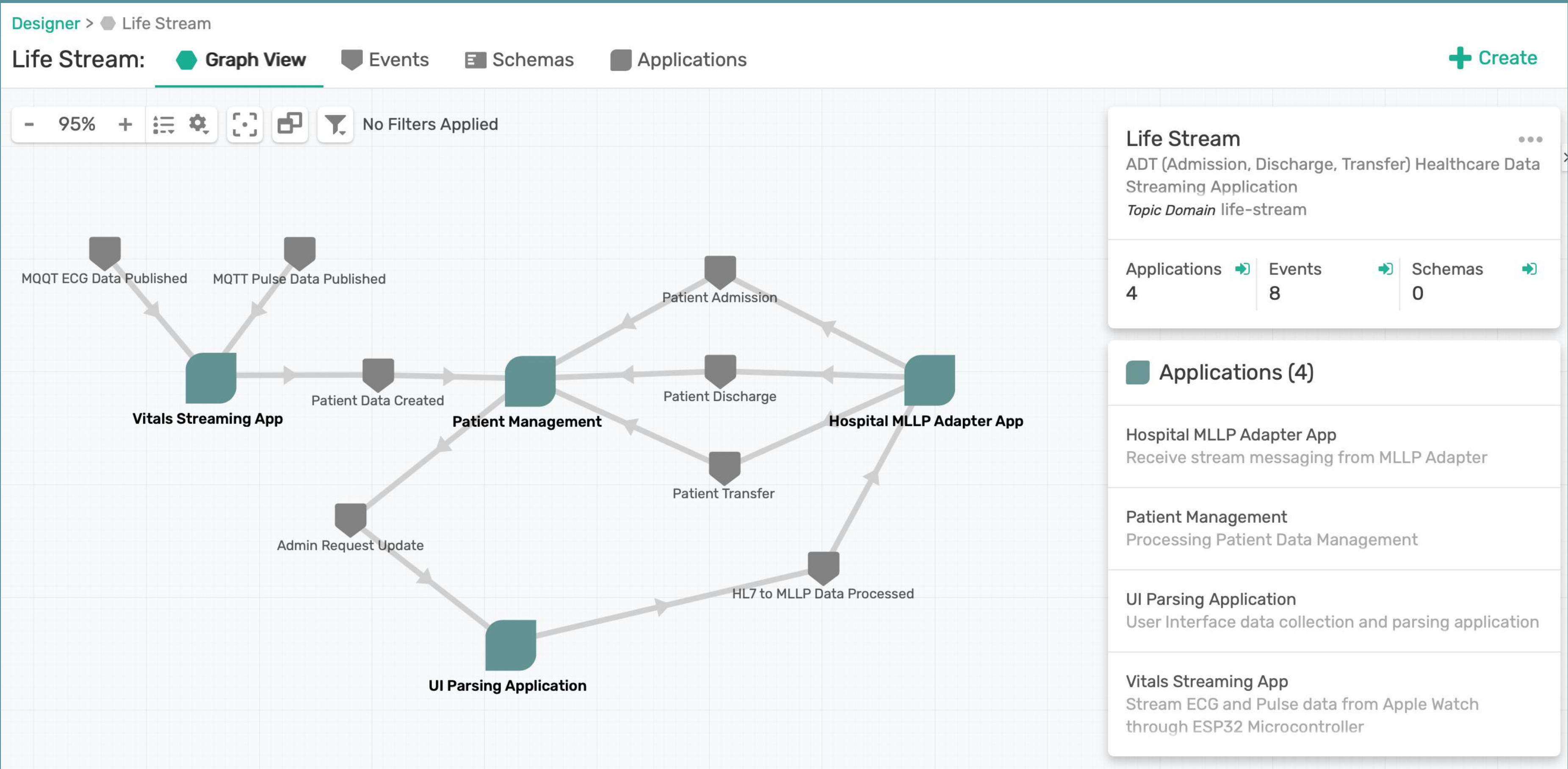
Solution

LifeStream is an ADT healthcare data streaming application that allows for **real-time communication** between hospitals across Canada through **event-driven architecture**.
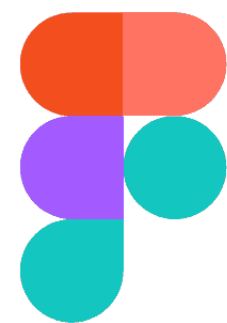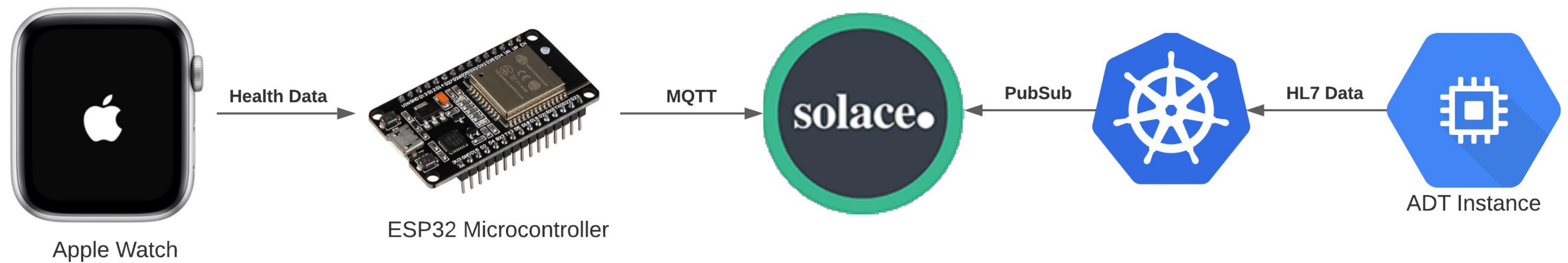
Users are able to **monitor data from other hospitals and distribute patients** in real-time, facilitating effective communication between healthcare institutions.
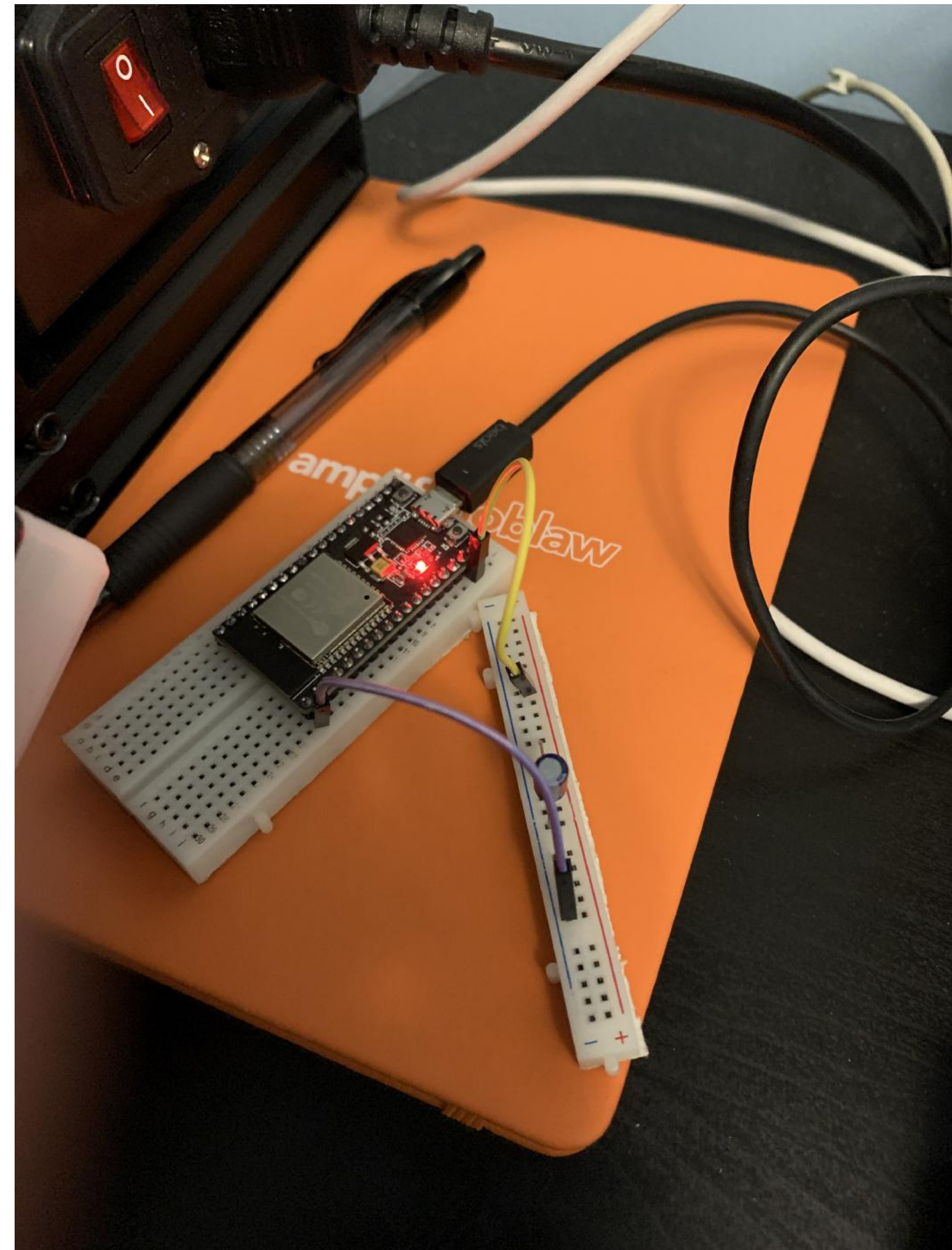
Technical Infrastructure

Technical Infrastructure

Apple Watch — Health Data → ESP32 Microcontroller — MQTT → solace. ← PubSub — (Kubernetes) ← HL7 Data — ADT Instance

Figma

Technical Infrastructure

Technical Infrastructure

LifeStream

Username

Password

Forgot your password?

Login

🏠 Dashboard

👥 Patients

📅 Appointments

📍 Locations

⚙️ Settings

↩ Log Out

Occupancy

ICU

	Current	Discharges	Admissions	Transfers
	15	13	5	2

Beds

5

24

19
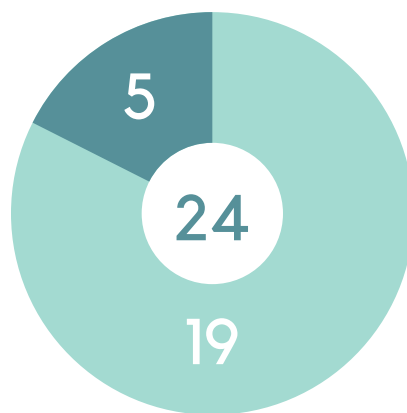
⬛ Occupied
⬛ Vacant

Ventilators

3

16

13
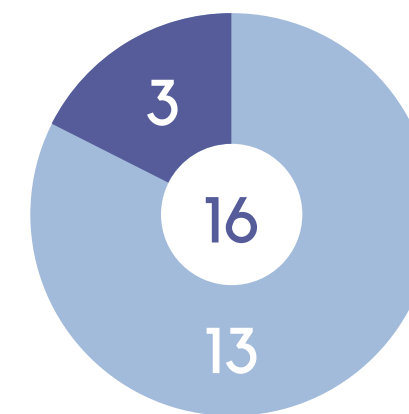
⬛ Available
⬛ Not Available

Surgery

	Current	Discharges	Admissions	Transfers
	19	16	6	4

Beds

6 12 6
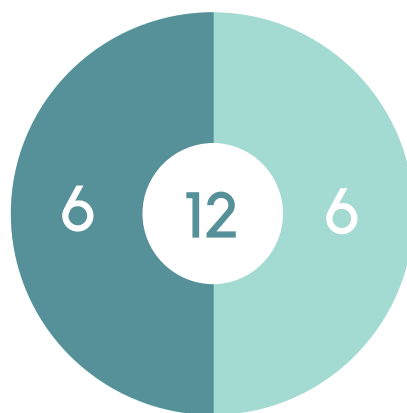
⬛ Occupied
⬛ Vacant

Anesthesia Machines
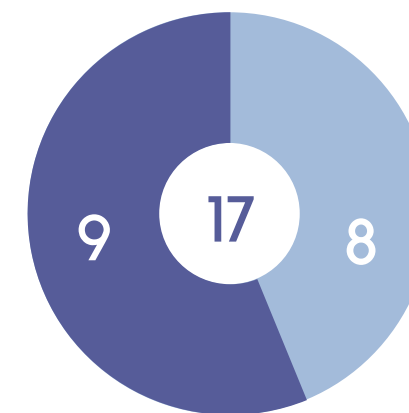
9 17 8

⬛ Available
⬛ Not Available

Search

Jennifer Peabody

Dashboard

Patients

Appointments

Locations

Settings

Patient Directory

Location: Toronto General Hospital ▾

Name		Patient ID	ADT Status	Department
Ismail Huerta		ID#	ADT-A01	Cardiology
Cataleya Sinclair		ID#	ADT-A03	ICU
Dale Blackwell		ID#	ADT-A04	NICU
Shakir Lancaster		ID#	ADT-A03	Surgery
Tomi Estrada		ID#	ADT-A05	Neurology

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Patient Profile

Ismail Huerta

Sex: Male
Date of Birth: 01/01/1970

Patient ID 123
ADT-A01 (patient admit)

Toronto General Hospital
Cardiology

Heart Rate   Medical History   Contact Information

Search

Jennifer Peabody

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Patient Profile

Ismail Huerta
Sex: Male
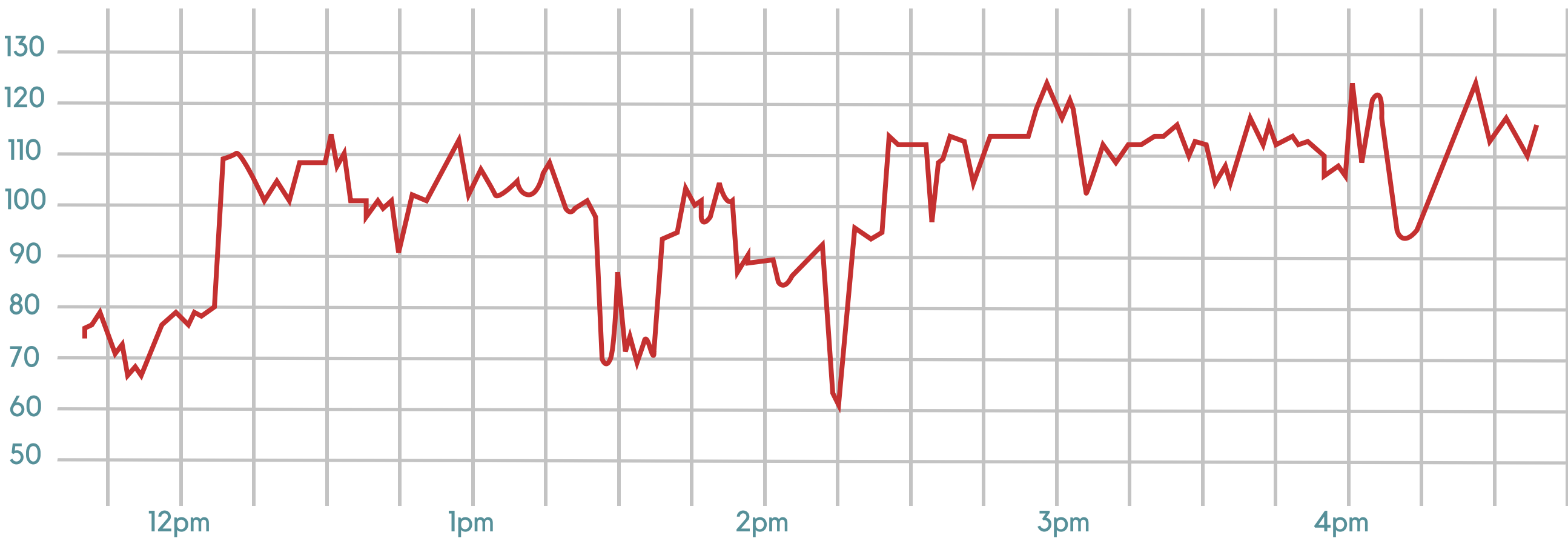Date of Birth: 01/01/1970

Patient ID 123
ADT-A01 (patient admit)

Toronto General Hospital
Cardiology

Heart Rate   **Medical History**   Contact Information

Condition	Diagnosed	Medications
Arthritis	16/03/93	Naproxen, Aspirin
Asthma	5/12/05	Reliever Inhaler
Anxiety	31/10/94	Bupropion HCL
Glaucoma	28/02/03	Beta Blockers
Hypertension	14/03/20	Metolazone

LifeStream

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Patient Profile

Ismail Huerta

Sex: Male
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Patient ID 123
ADT-A01 (patient admit)

Toronto General Hospital
Cardiology

Heart Rate   Medical History   Contact Information

Phone Number
(416) 123 4567

Email
h.ismail@gmail.com

Address
123 Apple Street. Toronto, Ontario. M1L 2K3

Current Location

Emergency Contact
Marianne Heurta

Emergency Contact Phone Number
(647) 321 7654

Address
123 Apple Street. Toronto, Ontario. M1L 2K3

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Hospital Locations

List View ≣
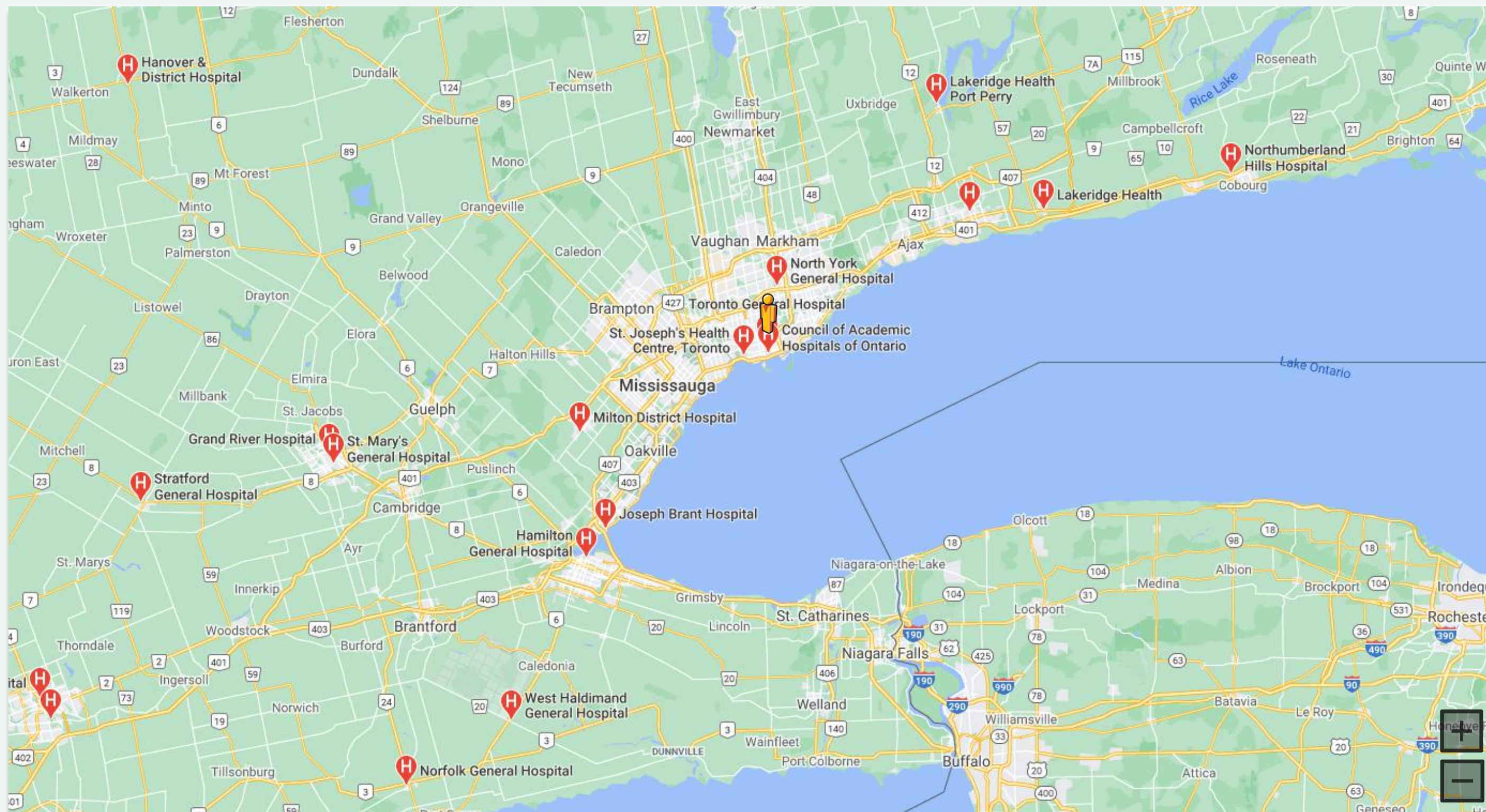
🏥 **Toronto General Hospital**
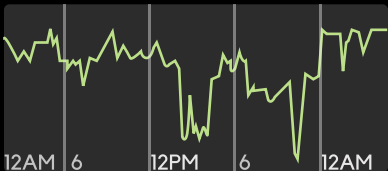200 Elizabeth St, Toronto, ON M5G 2C4

✓ **Admitting**

Province: Ontario ▾   City: Toronto ▾

4:56pm

12AM 6 12PM 6 12AM

68 BPM

65 BPM, 8m ago