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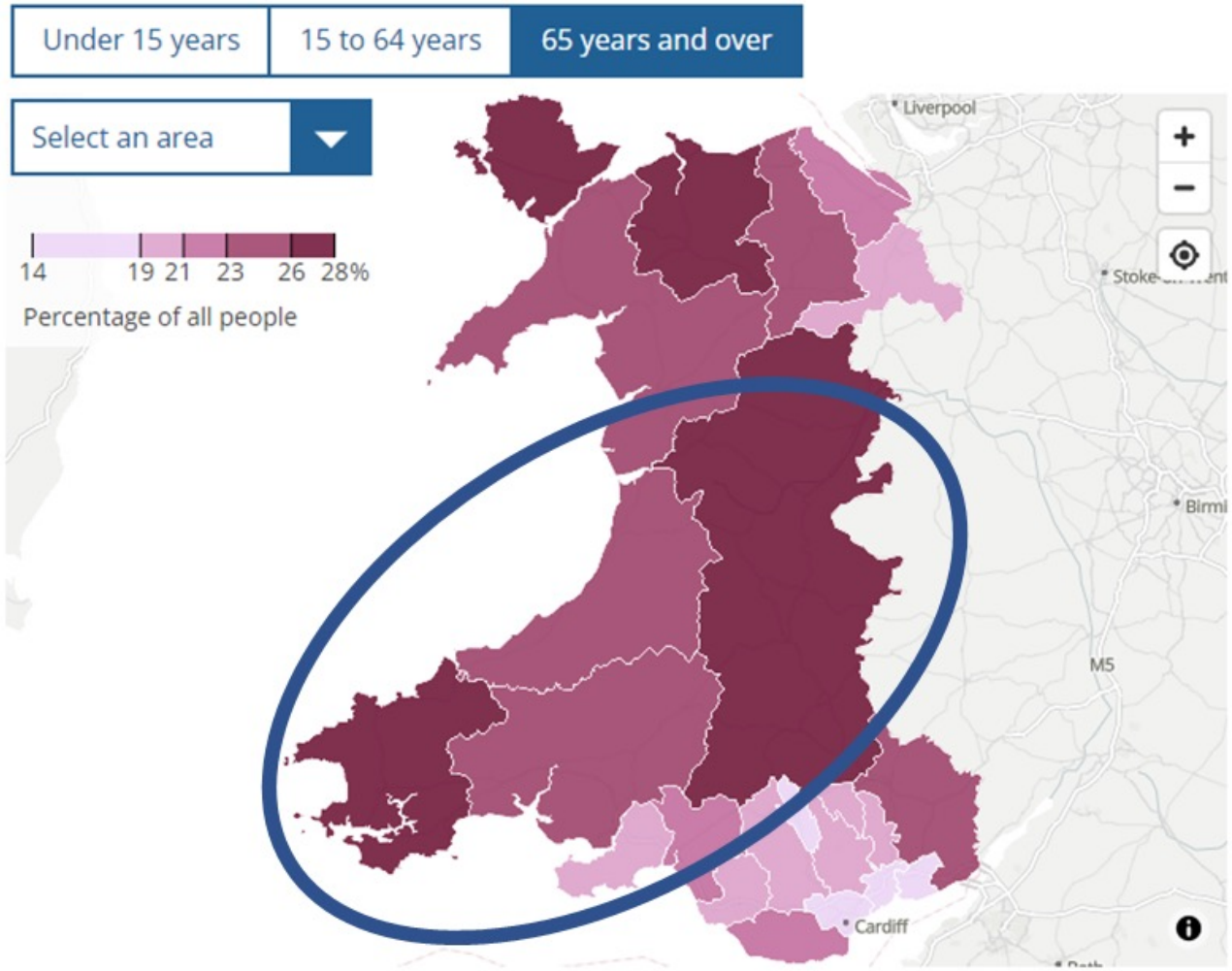
Bwrdd Iechyd Prifysgol Bae Abertawe
Swansea Bay University Health Board

Mending A Broken Heart

How healthcare professionals are using lean thinking to get to the heart of the problem and shorten clinical patient pathways by over 85%.

Professor Dave Smith, NHS Morriston Hospital, Swansea

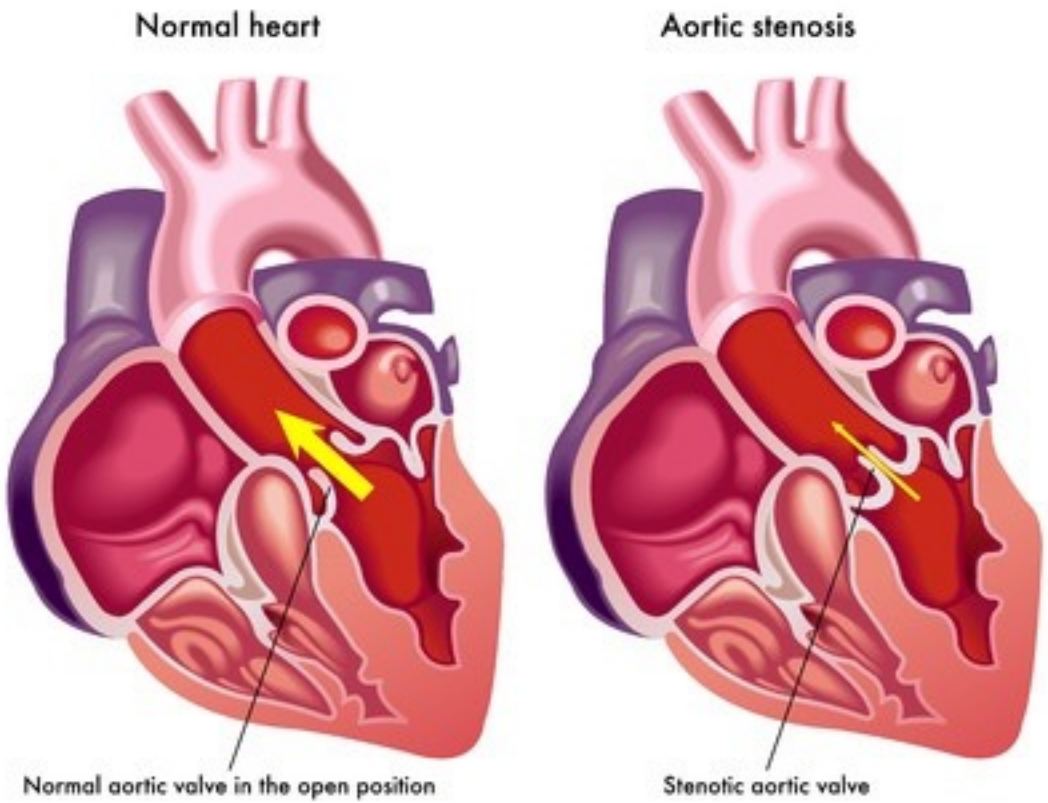
Figure 4: Age structure of the population, 2021, local authorities in Wales



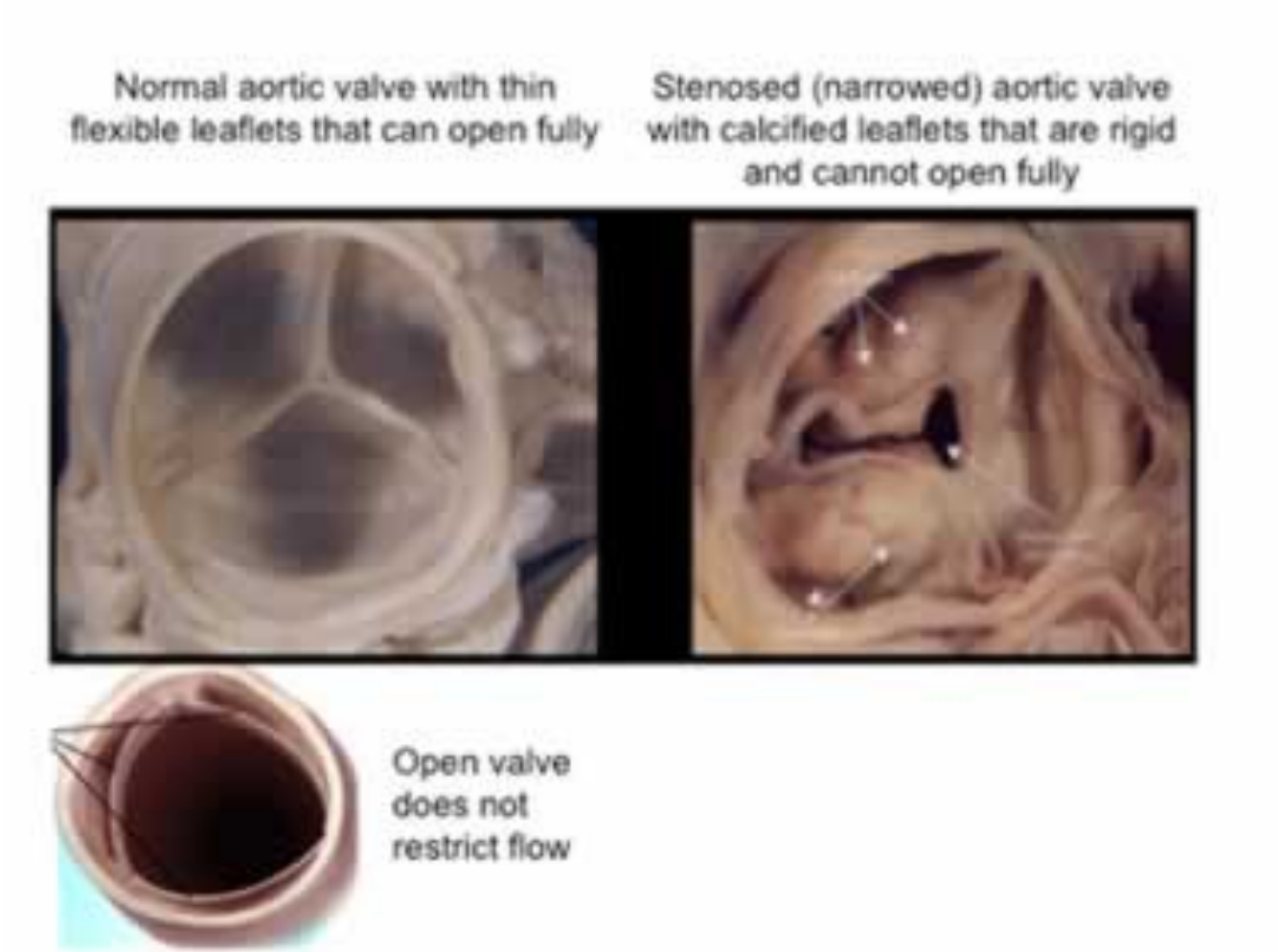
Source: Office for National Statistics - Census 2021

What is Aortic stenosis?

Aortic stenosis – most prognostic manifestation of valve disease

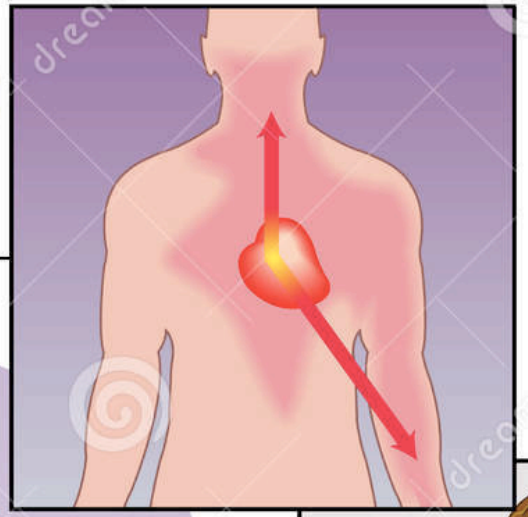


What is aortic stenosis?

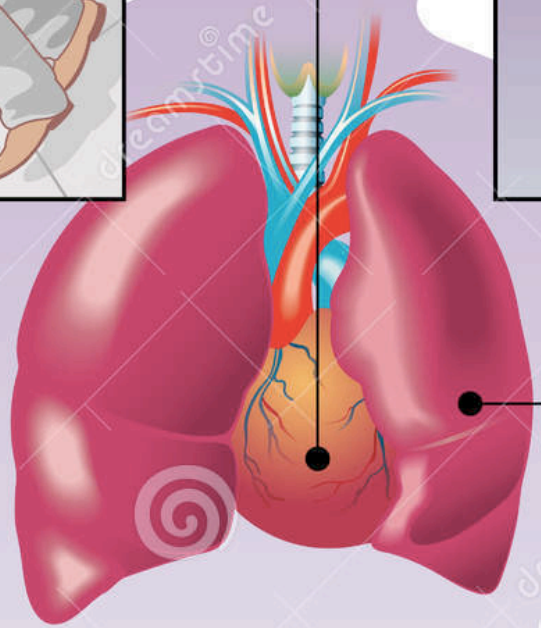


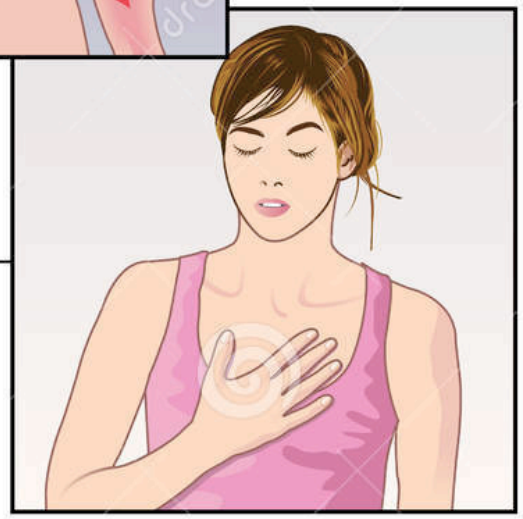
Symptoms of Aortic Stenosis

Chest pain



Collapse





Breathless

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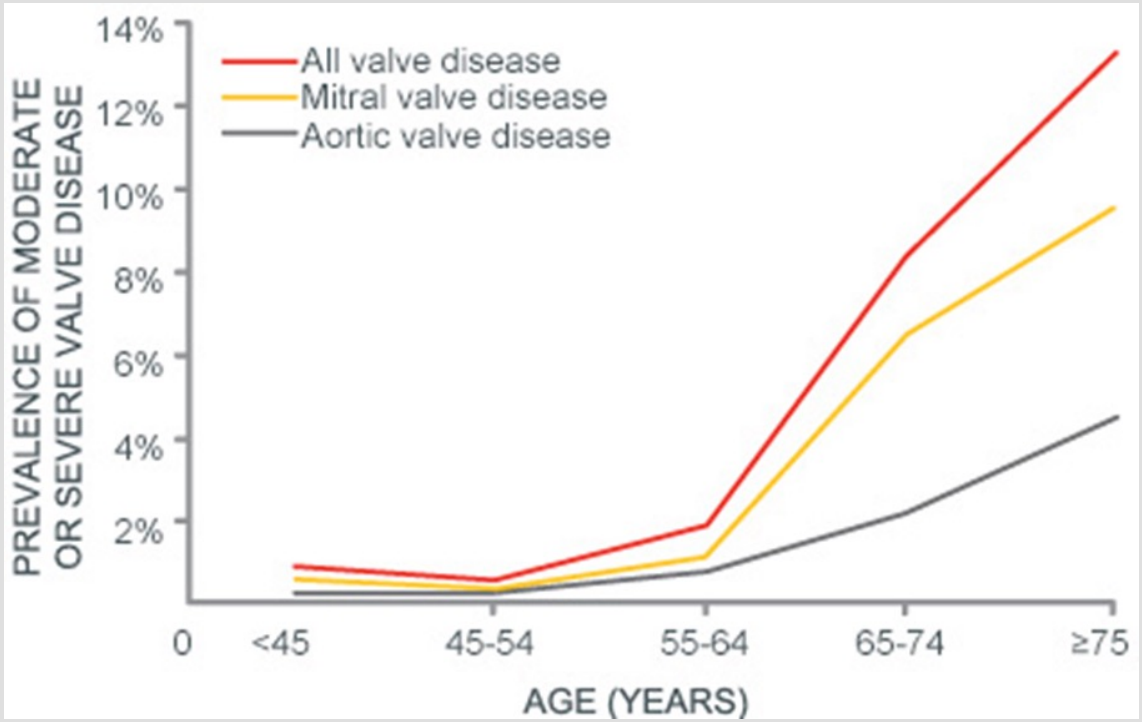
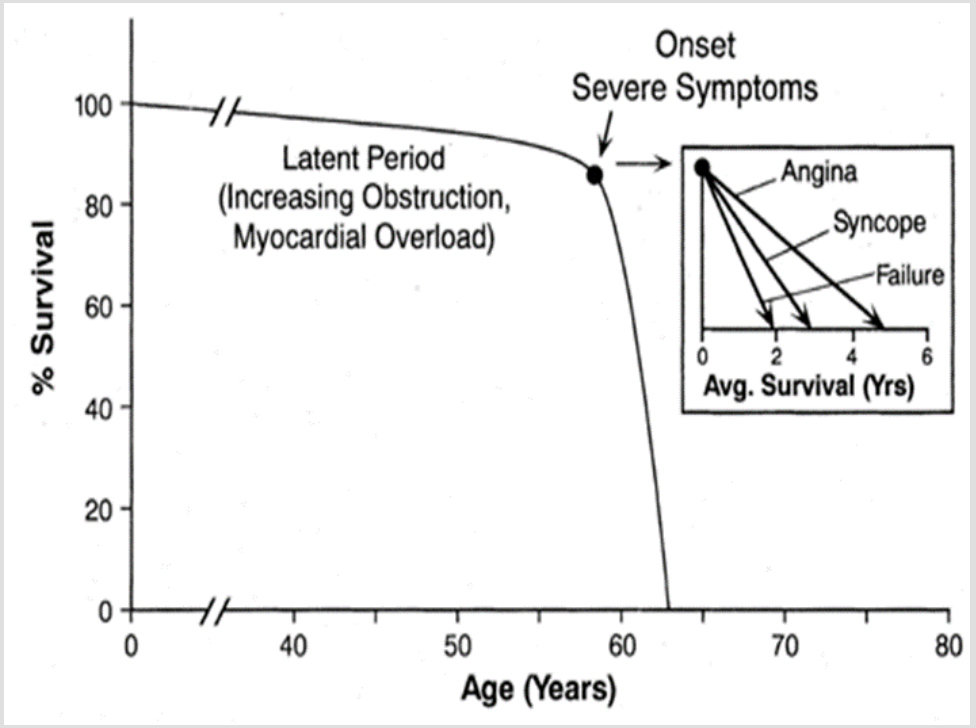
Challenges


PREVALENCE OF MODERATE OR SEVERE VALVE DISEASE
14%
12%
10%
8%
6%
4%
2%
0
All valve disease
Mitral valve disease
Aortic valve disease
<45
45-54
55-64
65-74
≥75
AGE (YEARS)


Onset
Severe Symptoms
Latent Period
(Increasing Obstruction,
Myocardial Overload)
% Survival
100
80
60
40
20
0
Angina
Syncope
Failure
0
2
4
6
Avg. Survival (Yrs)
0
40
50
60
70
80
Age (Years)

Mortality waiting for treatment for aortic stenosis

Longer waiting times result in significantly poorer outcomes

4%
Mortality at 1 month
Waiting for AVR

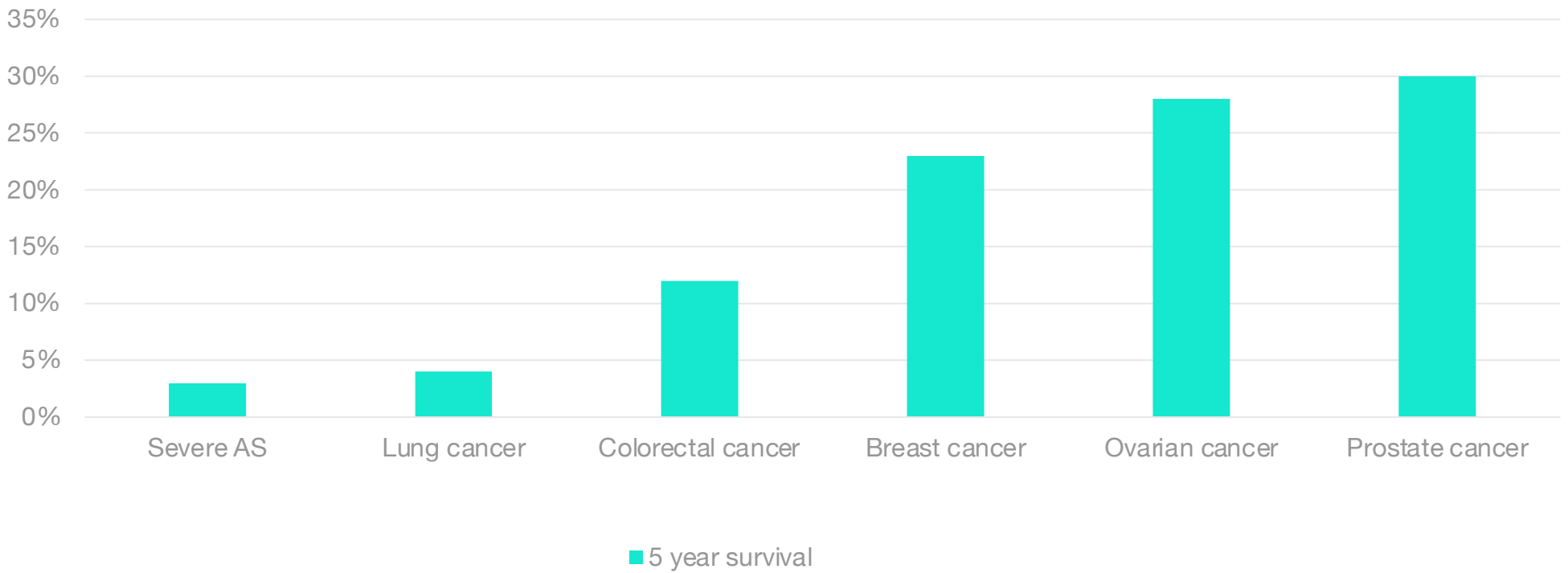
12%
Mortality at 6 months
Waiting for AVR

4%
Mortality at 1 month
Waiting for TAVI

23%
Mortality at 6 months
Waiting for TAVI

Malaisrie et al. Mortality while waiting for aortic valve replacement. Ann Thorac Surg 2014

Prognosis is dismal if untreated

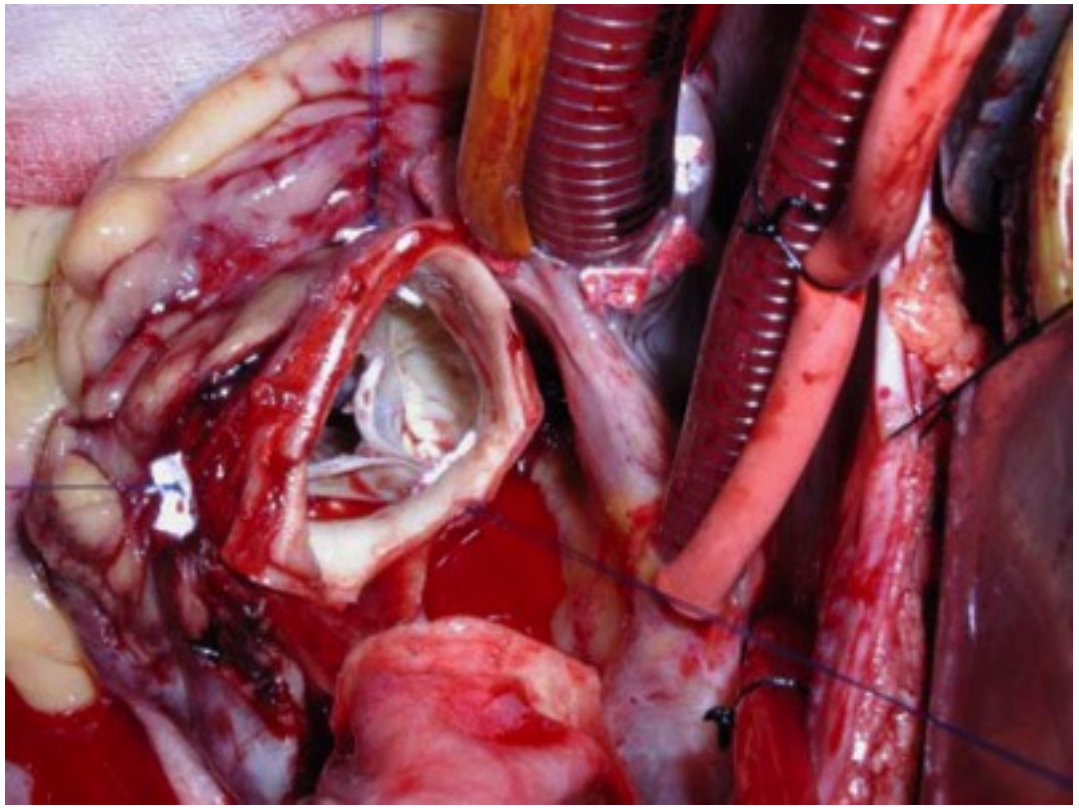


Options for treatment

- New heart valve needed
- No tablets that will sort out a mechanical problem

Open heart surgery (SAVR)
or
Transcatheter aortic valve implantation (TAVI)

Open heart aortic valve replacement

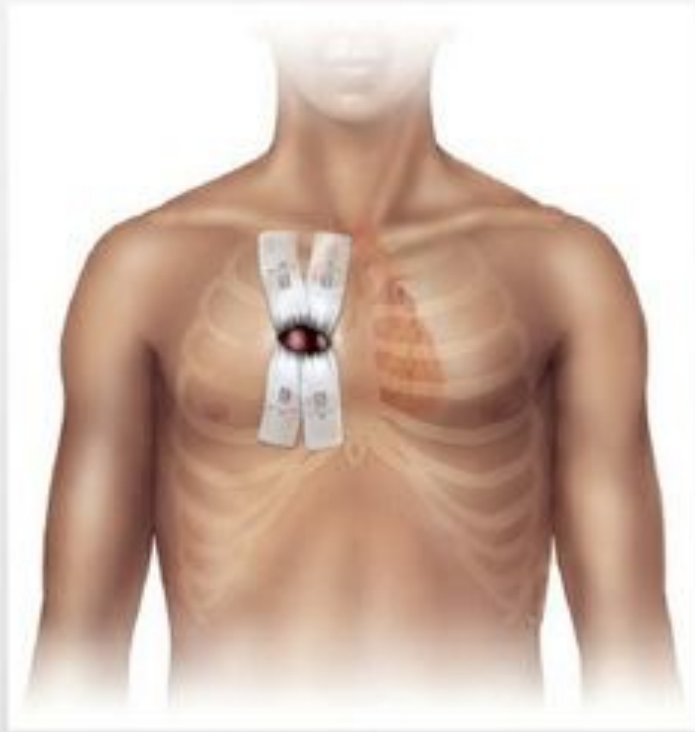


Aortic Valve Replacement Surgical Options

Conventional

Minimal Incision

Open-chest or Sternotomy



Right Anterior Thoracotomy

Mini-sternotomy

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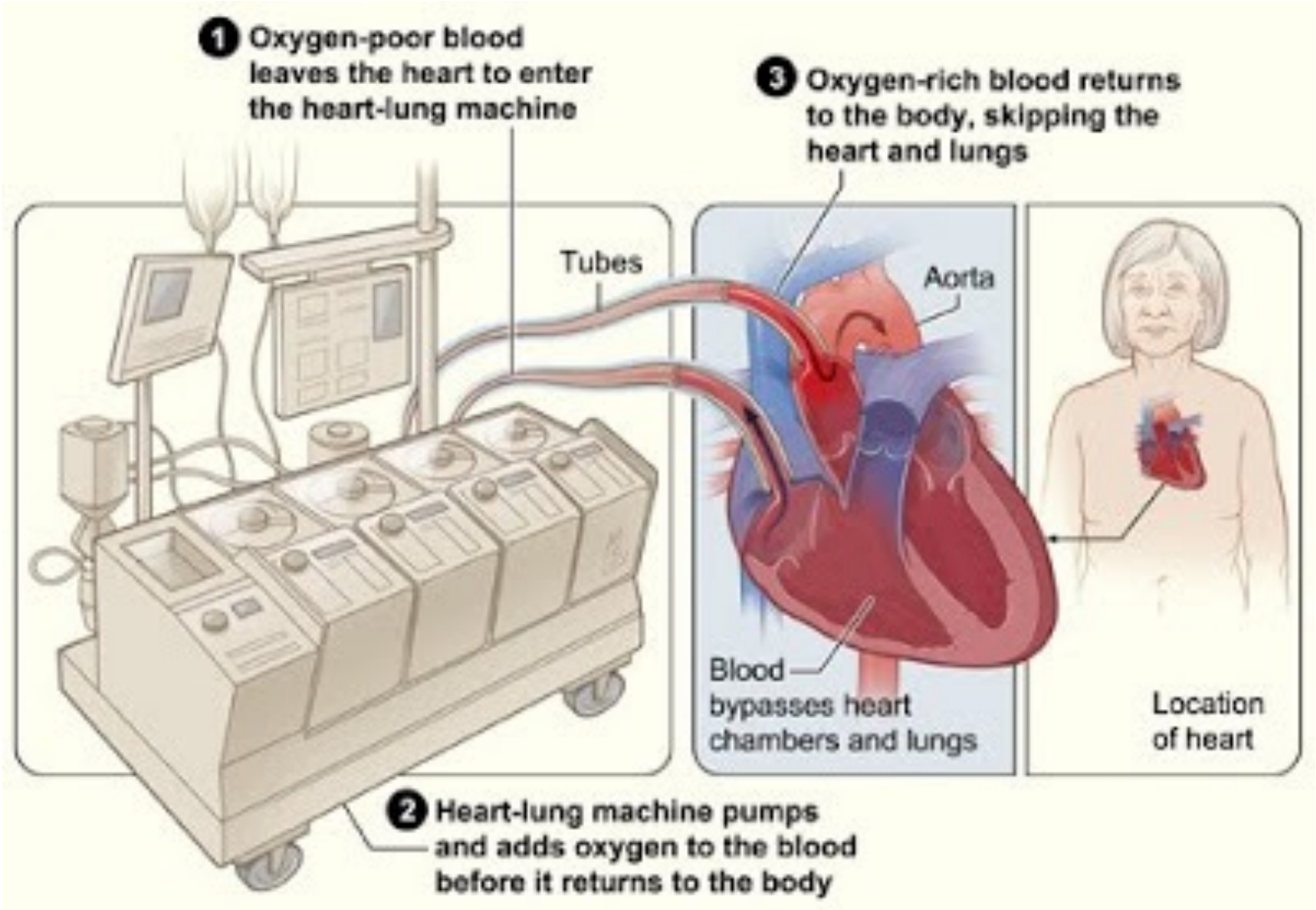
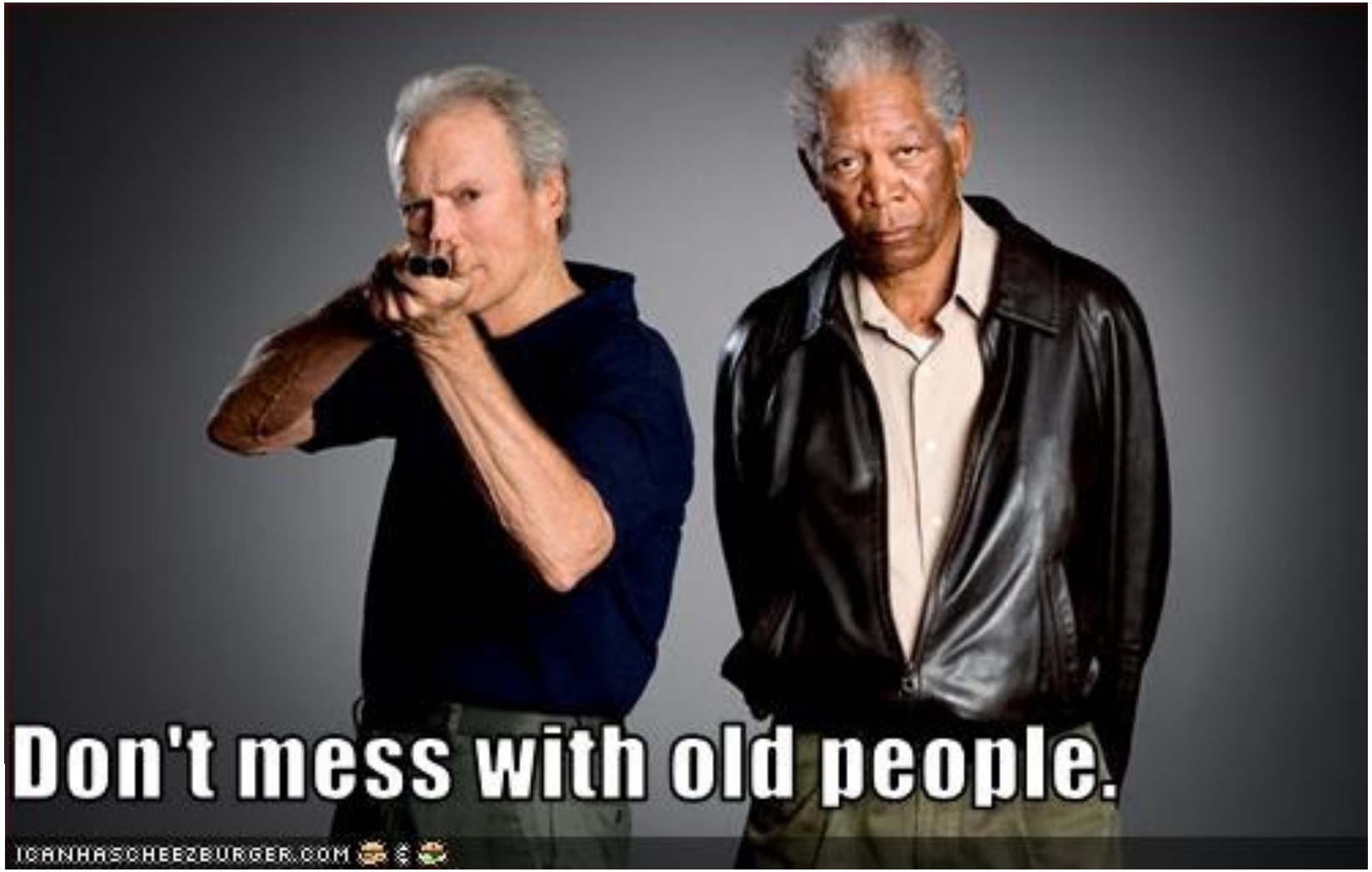
Required - heart lung bypass machine

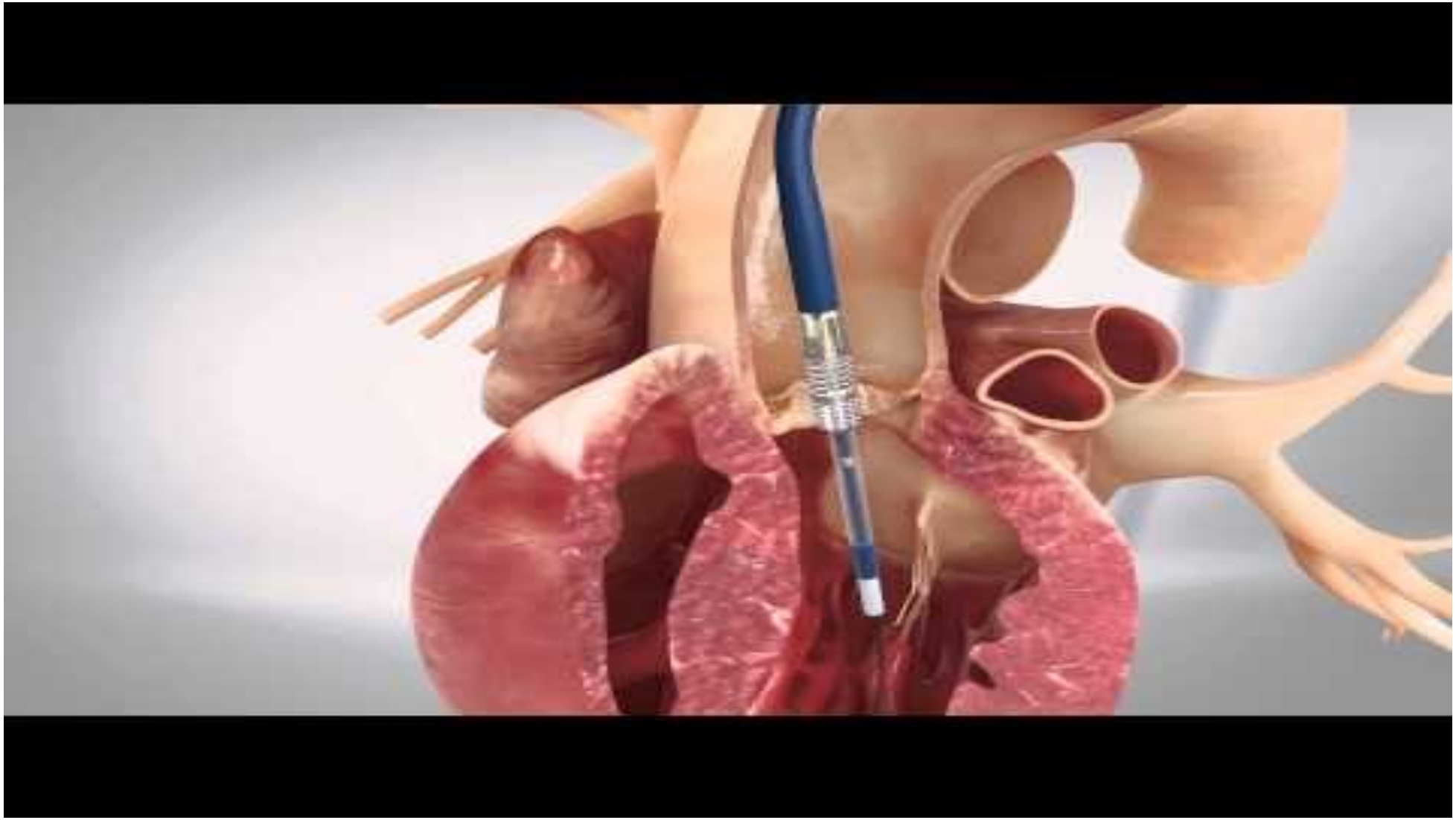


Required - cardiac intensive care

For all ages????



What is TAVI - Video



Morriston Hospital and TAVI European Centre of Excellence.


PHILIPS

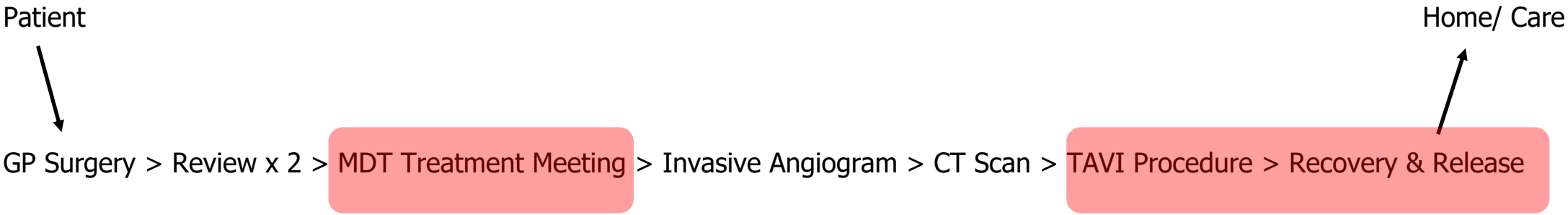
But the Patients waited and …

Mismatch in terms of demand versus capacity

52 weeks to 12-week target

(and UK Avg of 26 Weeks)

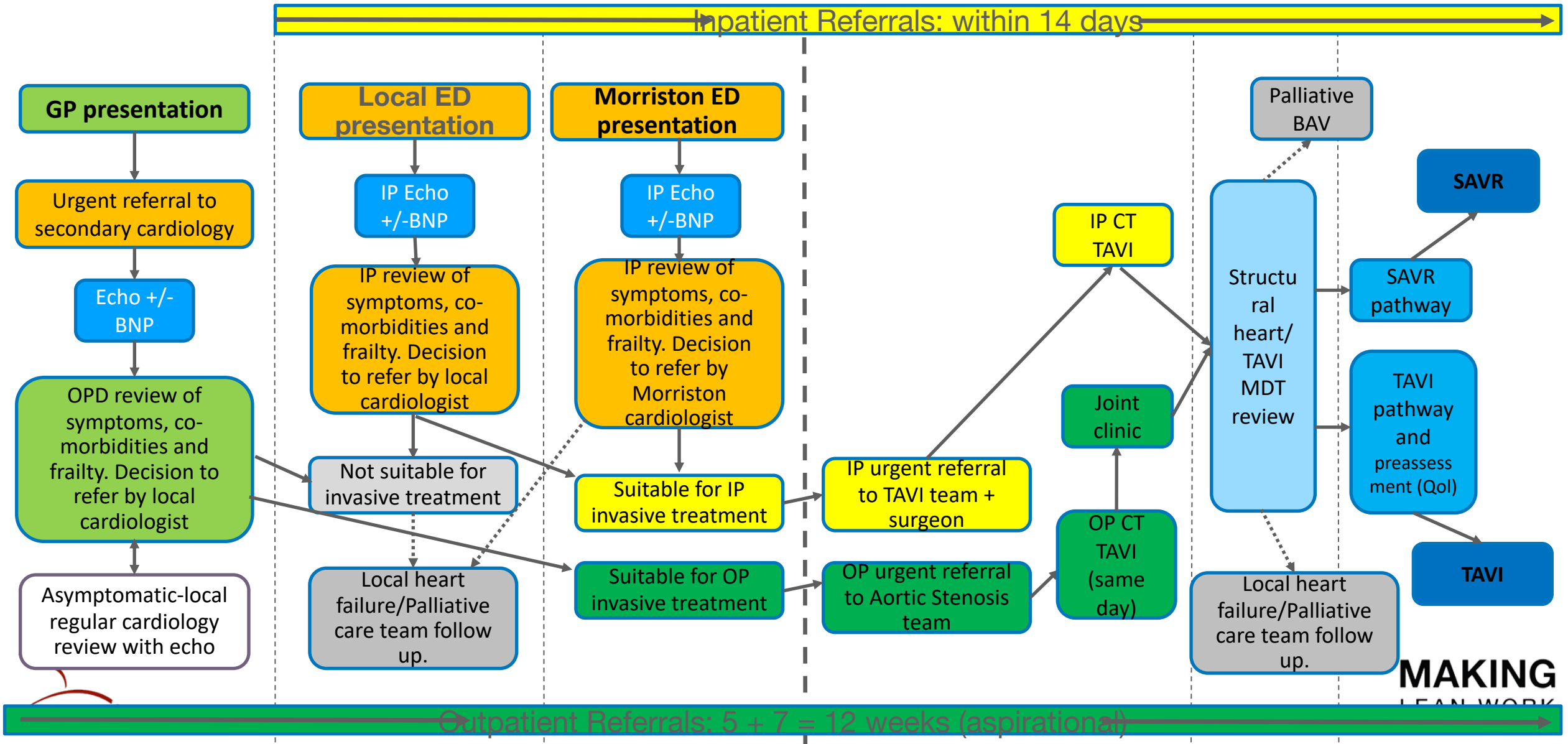
Pathway was made up of:



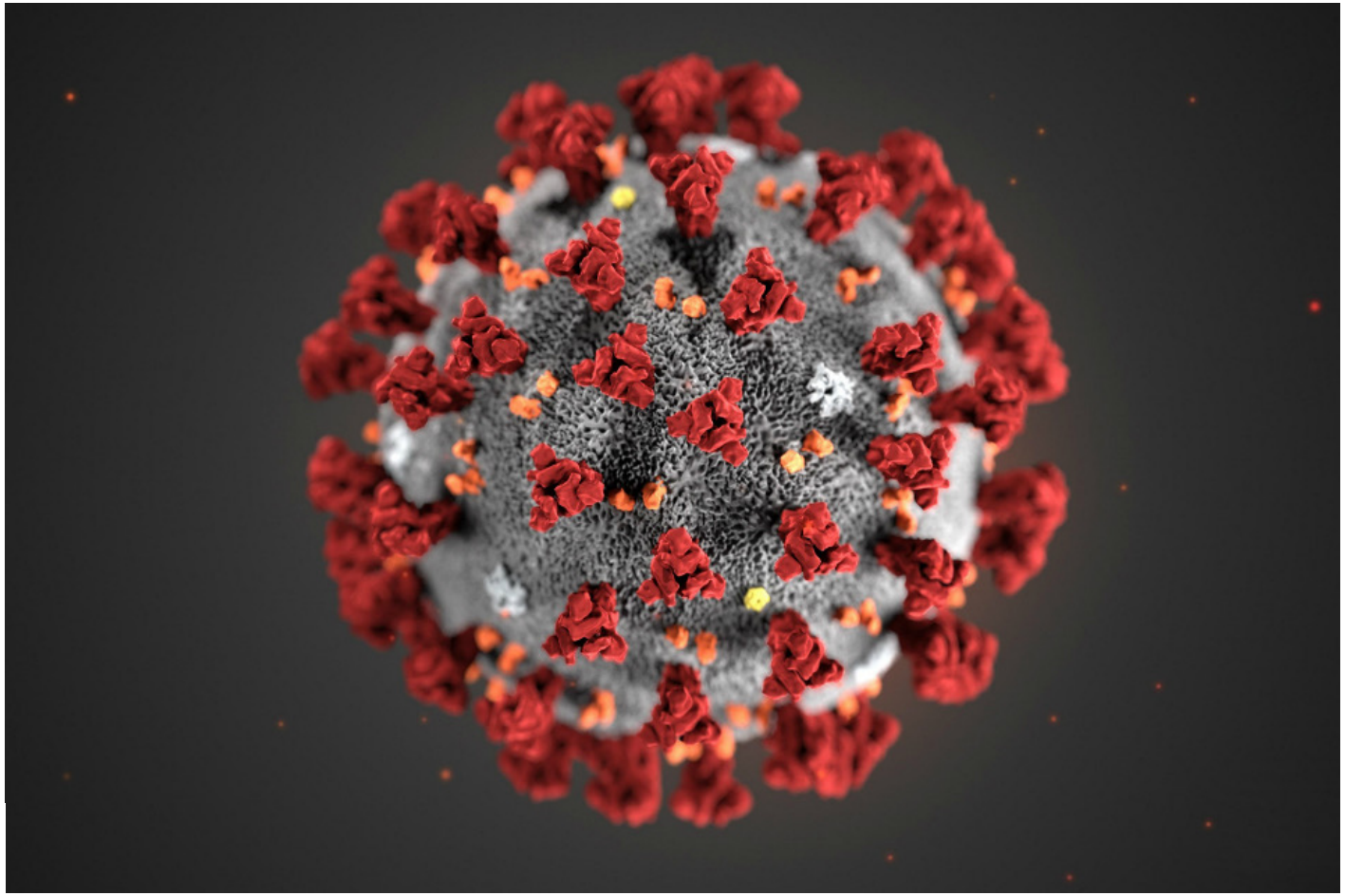
Our Improvement Plan -2019
Whole pathway focus

1. Problem Statement & Background
2. Observation/ Background
3. Current Situation
4. Development of the TAVI Future State Map and Improvement Plan
5. Implementing the Future State – Mending the Pathway
6. Maintaining standards

Regional TAVI Pathway @ Swansea Bay UHB



2020 - Covid: challenges and opportunities



What did the NHS recommend?

Publications approval reference: 001559

NHS England and NHS Improvement

Speciality guides for patient management during the coronavirus pandemic

Clinical guide for the management of cardiology patients during the coronavirus pandemic

20 March 2020 Version 1

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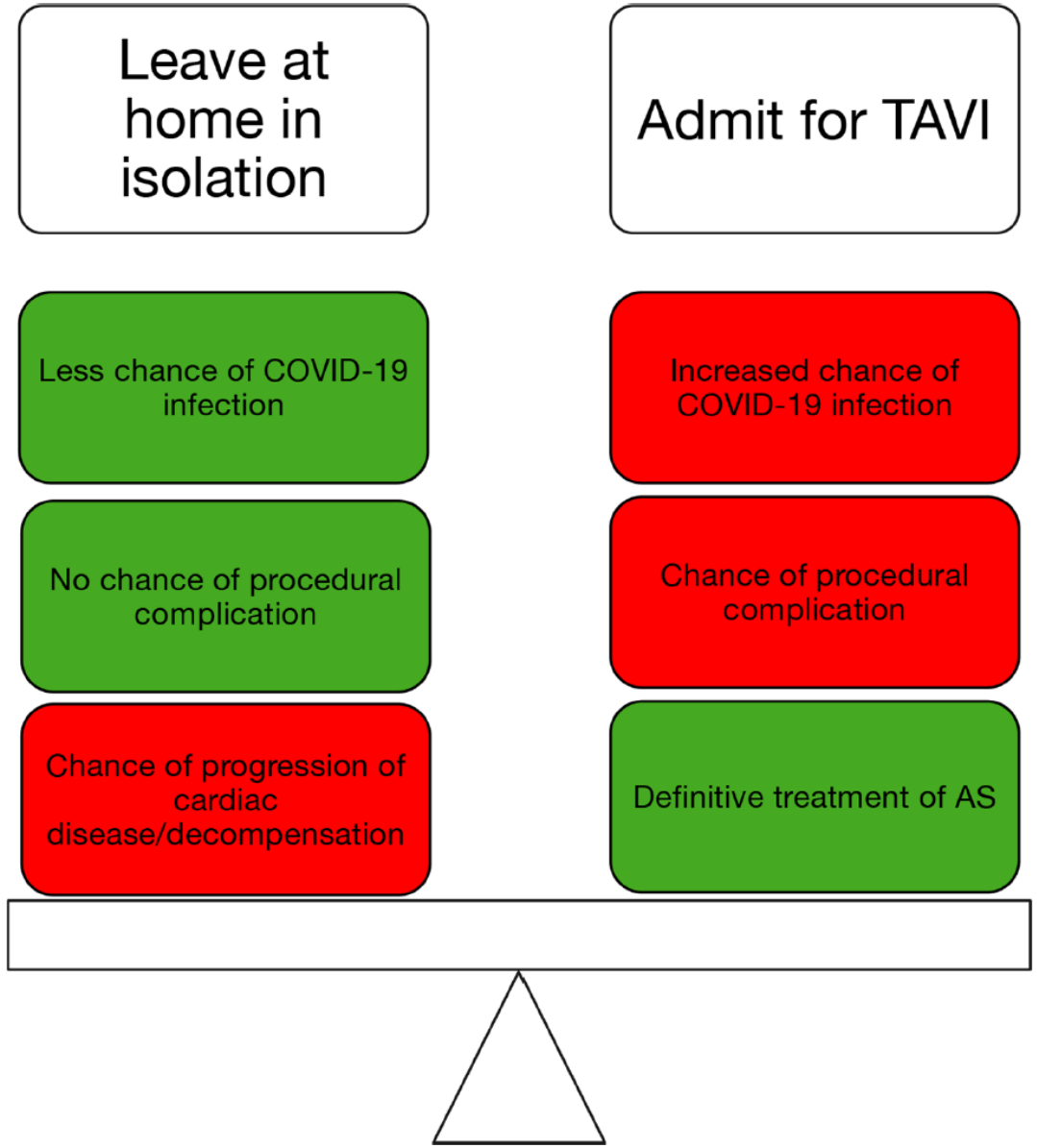
Headline recommendations

- Guidance was tailored to subspecialty areas including heart failure, arrhythmia, coronary disease and valvular heart disease, in particular the management of **aortic stenosis (AS)**

Rationale for performing TAVI during Covid-19 crisis

- Critical AS carries a very high monthly mortality making the risk on the waiting list high
- The risk of TAVI rises as the disease advances making the procedure more challenging if patients wait longer
- Decompensated patients with critical AS spend a long time in hospital when not treated, thus using precious resources and increasing their vulnerability to nosocomial COVID-19 infection
- Unlike sAVR, TAVI is a procedure that (usually) requires no ventilation or use of critical care capacity. TAVI length of stay is short, and patients are therefore subjected to less risk of acquiring COVID-19 during their hospital stay
- The literature shows equivalent outcomes to sAVR in all but low-risk patient groups

Admit for TAVI?



Acceleration of pathway modification

Patient pathway considerations

Phase of patient pathway	Alterations to practice
Case selection	Waiting list review and triage for highest risk Review SAVR waiting list Convert intermediate risk patients to TAVI if appropriate Convert low-risk patients to TAVI only with heart team consensus Consider risk to patient of nosocomial Covid-19 infection
TAVI diagnostic work-up	Avoid TOE
	Use Coronary CT instead of invasive angiogram
	Consider risk to patient of Covid-19 when attending for tests
	Do all/ as many tests in a single attendance
Procedure	Keep it simple
	Use devices operator/ team familiar with
	Transfemoral procedures only
	Consider appropriateness/ ethics of surgical bailout
Post-TAVI	Early safe discharge
	No need for follow-up echo until 6-12 months

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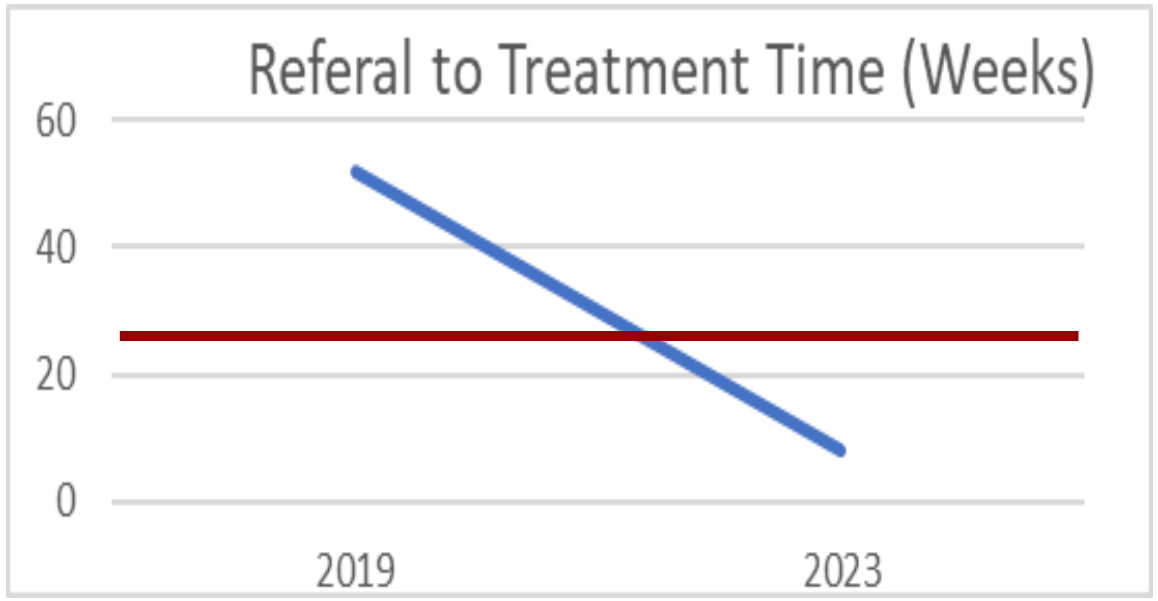
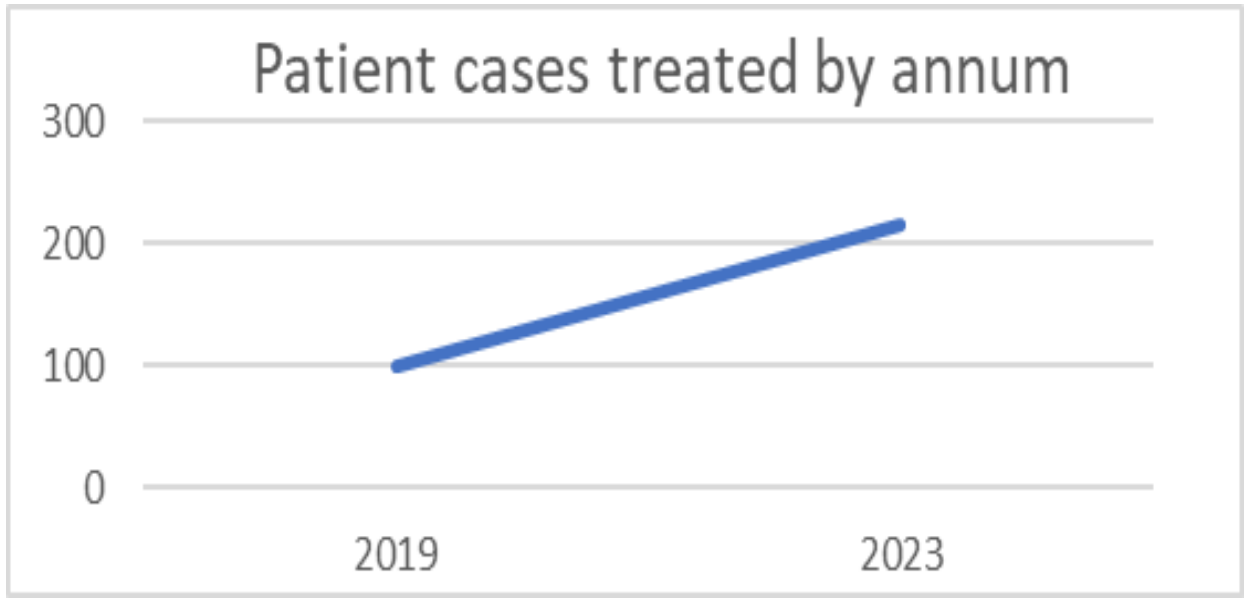
Patient risk stratification

Clinical	Investigations
NYHA class 4 symptoms or rapid recent deterioration	High peak and mean gradients
Syncope	Low valve area
Recent admission with decompensation (pulmonary oedema/ arrhythmia)	Poor LV systolic function
	Severe co-existent MR
	Significantly elevated NT-pro-BNP
	Excessive calcium score on CT
	Deteriorating renal function

Fast forward





Results

SBUHB TAVI Project Before and After	2019	2021	2022	2023 (yr end)
Referral to Treatment Time (RTT Weeks)	52	12	8	8
Procedure volume	100	166	216	300
Procedures per list	2		4	4-5
Patients treated within the 90-day target	10%		90-95%	
Inpatient v Outpatient (Elective / Scheduled)	70% v 30%		>90%	

Note: 2023, represents the year end forecast
In 2019, prior to the pandemic, the UK Average for Referral to Treatment Times stood at 26 weeks.

Leadership Lessons

Key Factors is Our Success

- ✓ **Whole pathway focus**
- ✓ **Recognising opportunity and making use of it**
- ✓ **Success often creates additional demand**
- ✓ **Set and maintain Standards – whole team responsibility and accountability**

Thank you