



GE HealthCare

Drugless, radiographer-led CT Coronary Angiography — Leading the way in coronary care

Value-based healthcare in action at
University Hospitals Plymouth NHS Trust



£2.36m
annual savings



+1,945
additional scans



#3 provider of CTCA
in England



Cardiovascular disease is the leading cause of death worldwide

It is estimated that in the UK alone over **eight million people** are living with heart and circulatory disease, resulting in **170,000 deaths a year** and an annual cost to the economy of **£29 billion**.

Cardiovascular disease most commonly manifests as coronary heart disease (CHD), which is the major cause of premature death.¹

National Institute for Health and Care Excellence (NICE) guidance for the assessment and diagnosis of recent-onset chest pain of suspected cardiac origin (Clinical Guideline 95 (CG95)) recommends diagnostic testing when stable angina cannot be excluded by clinical assessment alone.²

CT coronary angiography (CTCA) is recommended as the first-line diagnostic test, balancing patient safety and throughput, and keeping costs down compared to invasive coronary angiography (ICA).

Since the guidelines were issued, the demand for CTCA has grown exponentially,³ leading the University Hospitals Plymouth NHS Trust (UHP) to formulate and implement a pioneering drugless radiographer-led CTCA pathway that enables radiographers to independently run high throughput lists without routine pre-scan medication.⁴

Derriford Hospital
University Hospitals Plymouth NHS Trust



900-bed district general hospital



Regional cardiac tertiary referral centre



Six CT scanners
including Revolution™ CT and Revolution Apex systems from GE HealthCare.



40 radiographers at the hospital



Performs in the region of 50,000 CTs a year
including around 5,000 CTCA exams.



The challenge



Consultant-led procedure



Involves taking **multiple snapshots of the heart** between beats



Requires administration of **beta blockers**



30-minute appointment slots



Restricted throughput due to limited specialist availability

Historically, cardiac CT has entailed taking a **series of snapshots of the heart in between beats**, requiring the administration of **beta blockers** to slow down and control the patient's heart rate under the **supervision of a medical practitioner**.

This **consultant-led process** took, on average, **30 minutes per patient**, including preparation and recovery times, with **throughput restricted** due to limited specialist availability.

The aim

UHP identified an urgent need to enhance the cardiac CT workflow to:

- ✓ Increase CTCA capacity
- ✓ Improve efficiency of cardiac CT scanning
- ✓ Reduce long waiting times
- ✓ Improve compliance with NICE CG95
- ✓ Relieve the pressure on the consultant workforce
- ✓ Maintain equivalent diagnostic rate and dose
- ✓ Reduce costs

The solution

UHP installed a GE HealthCare Revolution Apex scanner, with a 16-centimetre detector, fast rotation time and an intelligent motion correction algorithm, in April 2021.

This high end, cardiac-enabled CT scanner allows exams to be performed in a **single heartbeat**, compared to seven heartbeats for 64-slice CT.



Its advanced technology **eliminates the need to administer beta blockers** – and, therefore, for a cardiologist to be in attendance – and makes it possible to scan patients with **fast and irregular heart rates**.

The implementation of the Revolution Apex scanner, combined with enhanced radiographer and reporter expertise, enabled UHP to embark on a value-based procurement study of **radiographer-led, drugless, unlimited single beat cardiac CT**.⁴ Following the success of the study, the drugless radiographer-led CTCA model is now fully embedded at UHP.

The process

UHP developed new drugless protocols, a robust governance framework, a standardised coronary artery disease-reporting and data system, and radiation dose monitoring, and promoted two cardiac CT radiographers into enhanced practitioner roles to support this innovative advanced non-medical practice.

A quality control audit of more than 1,400 patients was performed to confirm the model's safety, reliability and diagnostic performance.

Seven additional radiographers have since been trained to run lists and deliver the service as enhanced practitioners. One radiographer is also completing an MSc in advanced practice of radiographer reporting, and UHP plans to establish a formal advanced practitioner post to support long-term sustainability.



Drugless protocol

Eliminates routine pre-scan medication, enabling faster, safer cardiac CT workflows.



Radiographer-led scanning

Enhanced practitioners independently run CTCA lists, reducing reliance on consultant supervision.



Governance framework

Robust clinical governance ensures safety, consistency and accountability across the pathway.



Reporting standardisation

Structured coronary artery disease reporting and data systems improve consistency and quality.



Quality audit

Validation through 1,400+ patient audits confirms diagnostic performance, safety and reliability.



Training & workforce expansion

Radiographers upskilled into advanced roles to scale delivery and support long-term sustainability.

The results

A fully radiographer-led CTCA service now operates between 9am and 5pm, Monday to Friday, replacing traditional consultant-supervised sessions and improving efficiency across the pathway. This transformation has enabled greater service capacity while maintaining high-quality care.

As a result, University Hospitals Plymouth NHS Trust is now the third highest provider of CTCA in England—and the highest outside London—delivering this level of activity from a single CTCA scanner.



#3 in England



Highest outside London



Single CTCA scanner



Doubled activity

(30min → 15 min appointments)



Doubled reporting throughput



Increased scheduling flexibility



Radiographer development & satisfaction



Waiting times reduced

(120 days → < 30 days)



Lower costs

(no beta blockers + efficiency)

Financial benefits

£2.363 million annual savings



Scan increase
+1,945 scans (2024/25 vs 2019/20)



Annual saving
£2.363 million saving vs cath lab



Contrast reduction
Quicker scans require ~50% less contrast



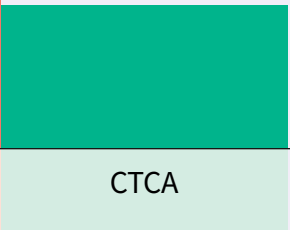
Lower workforce costs
Radiographer: ~£50,000 p.a. vs
Consultant: ~£139,500 p.a.

£1,572



ICA

£357



CTCA

Cost per patient

£1,215 saved per procedure

Savings with drugless, radiographer-led CTCA

£55,120 saved over 5 years

Contrast reduced

Contrast used per scan 2020-21 (consultant-led CTCA) = 90 ml
Contrast used per scan since 2021 (radiographer-led CTCA) = 50 ml

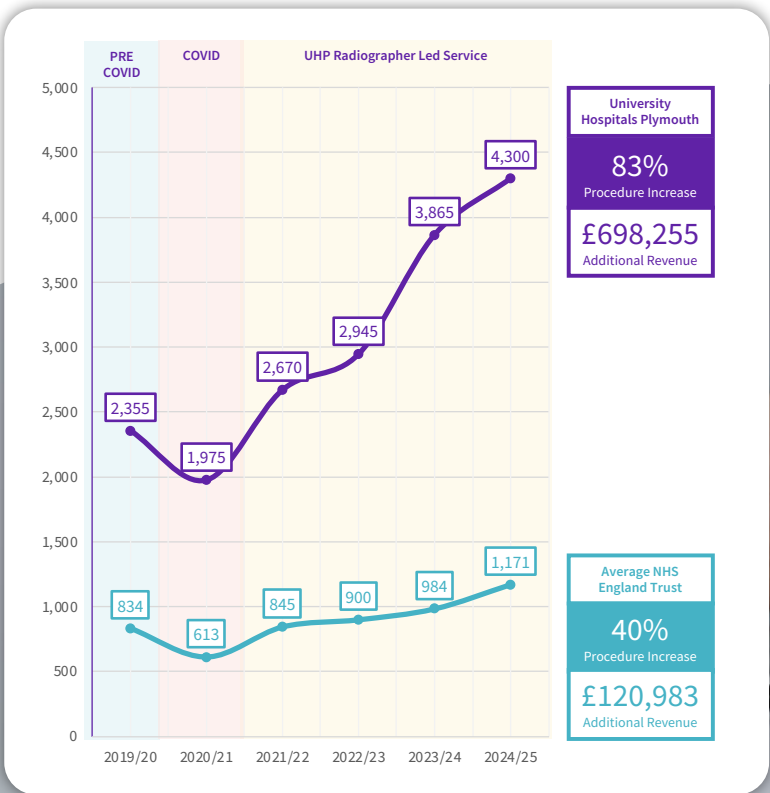
Cost saving

Contrast cost (2026): £300 for 6 x 500 ml = £0.10/ml
From 90 ml → 50 ml per scan = 40 ml less contrast per scan
(£4 saving per scan)

Estimated annual contrast savings with drugless, radiographer-led CTCA*:

2021-22	2,670 scans x £4	£10,680
2022-23	2,945 scans x £4	£11,780
2023-24	3,865 scans x £4	£15,460
2024-25	4,300 scans x £4	£17,200

*Best estimate, based on 2026 prices. Pricing from previous years not available. Does not account for contrast wastage.



Operational benefits

Significant improvements in capacity, efficiency and patient access



4,300 CTCA scans/year
delivered from a single scanner

Highest productivity centre
4,300 scans vs ~800–2,200 typical across comparable centres



20 mins appointments
reduced from 30 minutes

Shorter appointments
Reduced from 30 min (consultant-led) to 20 min with radiographer-led workflow



+1,945 scans
vs 2019/2020 baseline

Increased activity
Additional scans delivered annually through improved workflow efficiency and capacity



2-3 week wait times
halved since implementation

Reduced waiting times
Now 2–3 weeks, enabling improved access and compliance with NICE CG95



Quality & safety



Non-diagnostic rate reduced
From 6.7% → 3.5%



Radiation dose reduced
176 → 173 mGy.cm
(vs UK average 209 mGy.cm)



Maintained diagnostic quality
Improved efficiency achieved without compromising clinical outcomes



Increased capacity



10 consultant sessions freed weekly
Released capacity to support cath lab activity and complex imaging



Reporting capacity doubled
Radiologists able to focus on higher-value specialist work



Radiographer-led delivery at scale
Advanced practitioner model enabling sustainable service expansion

Further opportunities

National recognition
The success of the drugless radiographer-led CTCA protocol has seen UHP win the South West Region NHS Excellence Award 2026 for delivering value,⁷ with NHS England designating the trust as a national showcase beacon site.

Future expansion
UHP will continue to expand this model, including structured workforce development and extended operating hours, and the introduction of AI-assisted reconstruction and reporting technologies.

Community diagnostic centre
It is also investing £750k in the installation of a high end cardiac CT scanner in a Community Diagnostics Centre, due to open on June the 23rd 2026, which will allow the trust to introduce 15-minute appointments and move from three patients an hour to four, gaining a further £357 per hour from the CTCA tariff.

Operational capacity will be expanded across both acute and community sites – with additional cost savings as more patients avoid ICA – and the service will be integrated more closely with preventative cardiology pathways as part of a long-term strategy to detect CHD earlier.

References

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Jane Smith

111-222-333-444

10/07/1975 Sex: F

26.9 Trauma Full Body DMPR

Auto

