

The CHANGING face of our WORKFORCE: what will it look like in 10 years' time?

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Workforce Planning

Right People Right Skills Right Time Right Plan Right Cost



Vascular Disease in UK



6,000 Aneurysm Repairs	4,000 Carotid Operations
25,000 Revascularisations	5,000 Major Amputation

Vascular Disease

- 1 in 3 Deaths CVD
- 166,000 Deaths UK
- 100,000 Strokes UK
- 4,000 AAA Screens
- 5 million have PAD
- 3 million Diabetics

What is Vascular Surgery

Vascular Surgeons treat:

- Arteries
- Veins
- Lymphatics

Vascular Skills include:

- Vascular Medicine
- Open Vascular Surgery
- Endovascular Therapy

Not much outside heart and head we don't treat!



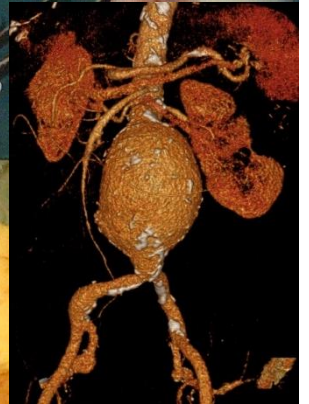
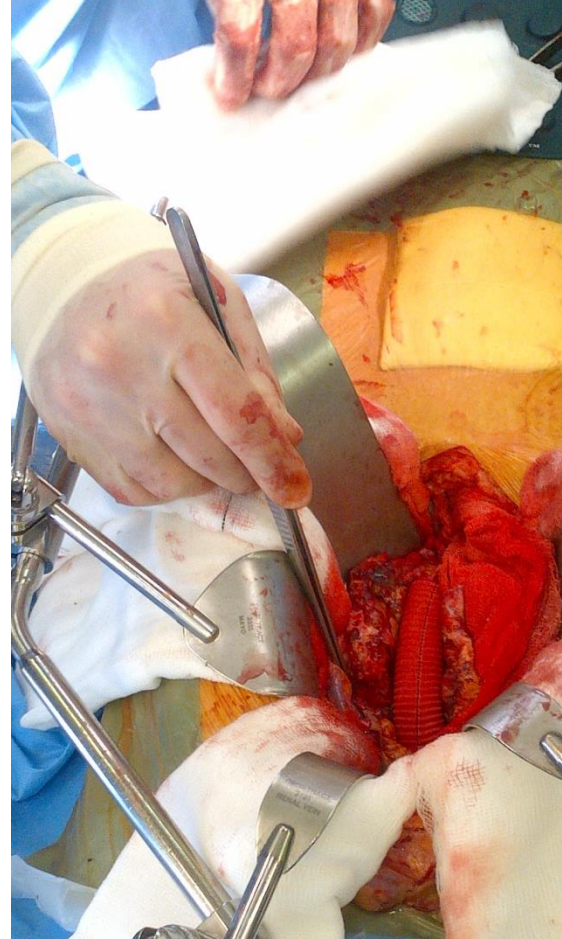


The journey to a minimally invasive approach

- 1927 Reynaldo dos Santos performs the first angiogram, in Portugal
- 1929 In Germany, Werner Forssman performs the first cardiac catheterisation
- 1951 Charles Dubost, in France, performs the first durable abdominal aortic aneurysm reconstruction using a homograft
- 1953 Sven-Ivar Seldinger introduces the Seldinger technique
- 1961 Thomas Fogarty creates the Fogarty embolectomy catheter
- 1964 Charles Dotter dilates a peripheral stenosis with a guide-wire and coaxial Teflon catheters
- 1977 Andreas Grüntzig performs the first percutaneous transluminal coronary angioplasty
- 1985 Palmaz introduces balloon-expandable stents
- 1985 In Kharkov, Ukraine (then Soviet Union), Nicholay Volodos uses a self-fixing synthetic endoprosthesis to perform his first transfemoral remote endosprothesis implantation in an iliac artery. Two years later, he performed an endovascular repair for an aneurysm in the descending section of the thoracic aorta
- 1990 Parodi and Palmaz perform the first successful EVAR in the Western world
- 2005 Tim Chutter creates a fenestrated endograft

Evolution Vascular Surgery

What is Vascular Surgery

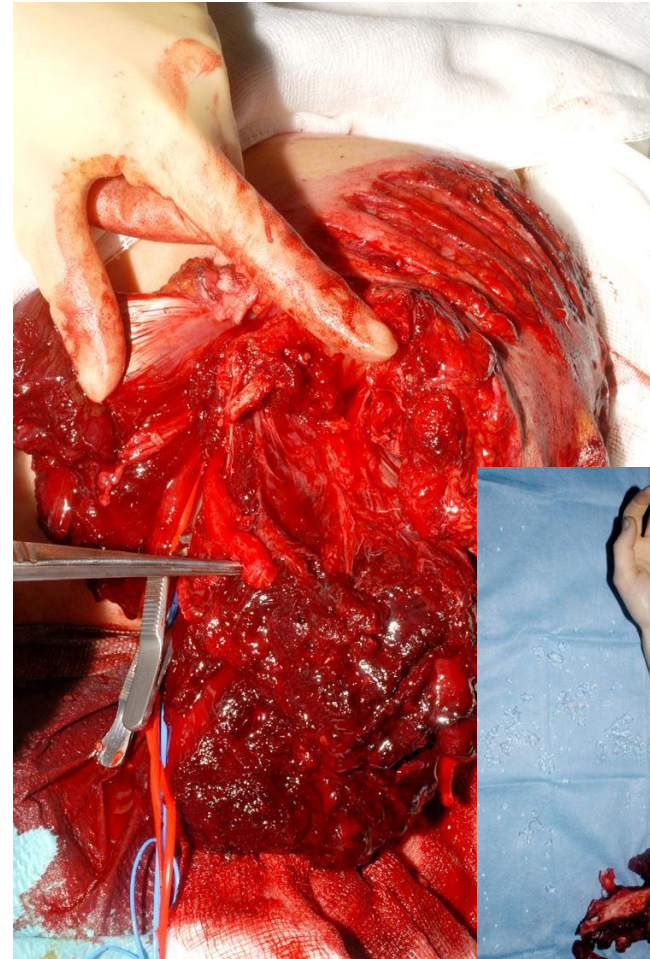


PAD

STROKE

ANEURYSM

What else is Vascular Surgery



DIABETES

VEINS


TRAUMA

Workforce Survey



Vascular Surgery UK Workforce Report 2014

*Results of a Survey of the Consultant Vascular Surgery
Workforce in the UK*



Vascular Surgery United Kingdom Workforce Survey 2018

Vascular Society of Great Britain & Ireland

USA 2008:
1 per 108,000 Population

Predicted Increase Demand:
• 72% (2030)

UK 2013:
1 per 137,000 Population

Predicted Increase Demand:
• 67% (2029)

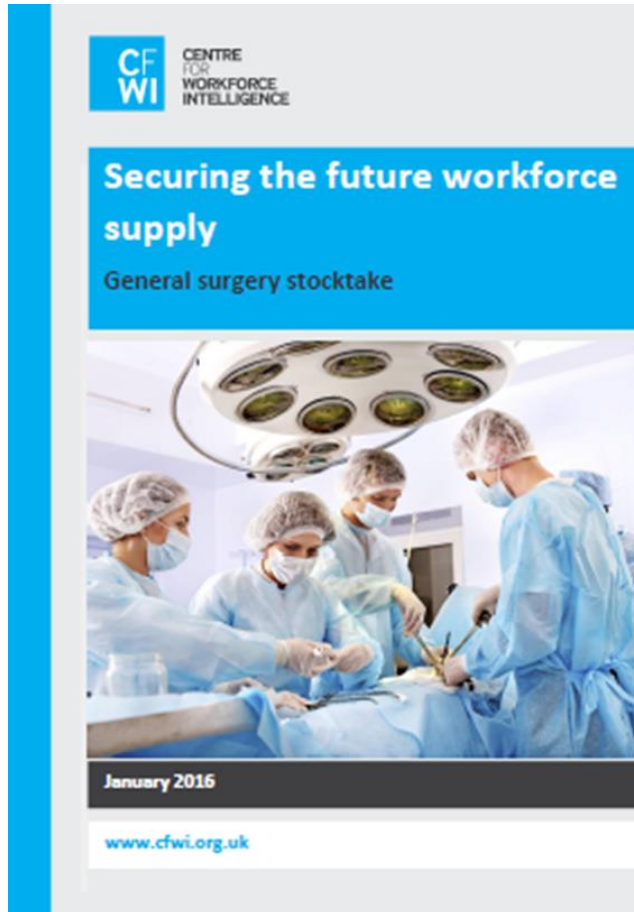
France 2011:
1 per 107,000 Population

Predicted Increase Demand:
• 61% (2030)

WORKFORCE

Harkin DW, et al. The vascular surgery workforce: a survey of consultant vascular surgeons in the UK, 2014. *Eur J Vasc Endovasc Surg* 2015 Apr;49(4):448e54. Satiani B, et al. Predicted shortage of Vascular Surgeons in the United States: population and workload analysis. *J Vasc Surg* 2009;50(4):946e52. Berger L, et al. Vascular surgeons in France: an endangered species? *Ann Vasc Surg* 2012 Nov;26(8):1154e9.

General Surgery



General/Vascular Surgery 2016

- 2075 Consultants (England)
- (21% Vascular Surgeons)
- 3.6% Annual Growth
- 916 NTN (Ratio 0.44)

Demand Increase 67% (2029)

UK Population Increasing & Aging



Figure C1: Changing population 2014 to 2029, England

The CfWI factored ONS population forecast by age group from 2014 to 2029.

	Age and population (thousands)									
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
2014	6,680	6,174	7,361	7,092	7,599	6,886	5,876	3,967	2,121	474
2029	6,921	7,064	7,061	7,751	7,451	6,877	7,131	5,184	3,398	947
2014 to 2029 change	4%	14%	-4%	9%	-2%	0%	21%	31%	60%	100%
	10%									
	3%					34%				

Source: ONS, 2013

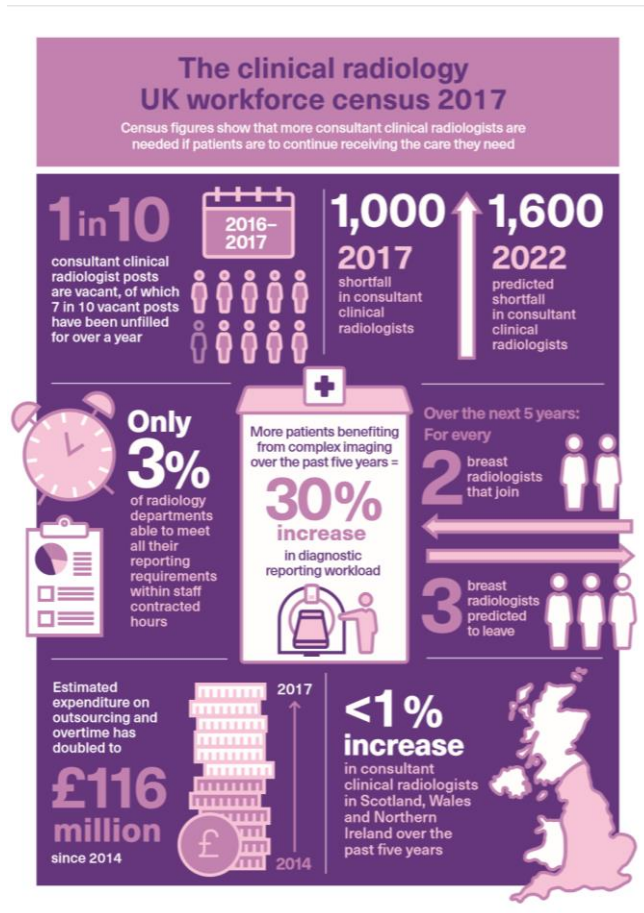
Population Growth by 10% (2029)

Population 60+ Growth by 36% (2029)

Predicted 947,000 Very Old People 90+ Years (2029)

MDT “This is a very good 103 year old with a 7cm AAA?”

Interventional Radiology



Clinical Radiology 2017

- UK 3656 Consultants (+13%)
- 10% Posts unfilled (9% for IR)
- 73% General Radiologist
- 435 (13%) Vascular IR Interest
- NTN/Consultant Ratio **0.28**

**UK Demand Diagnostic Imaging
Unmet Need +1004 WTE**

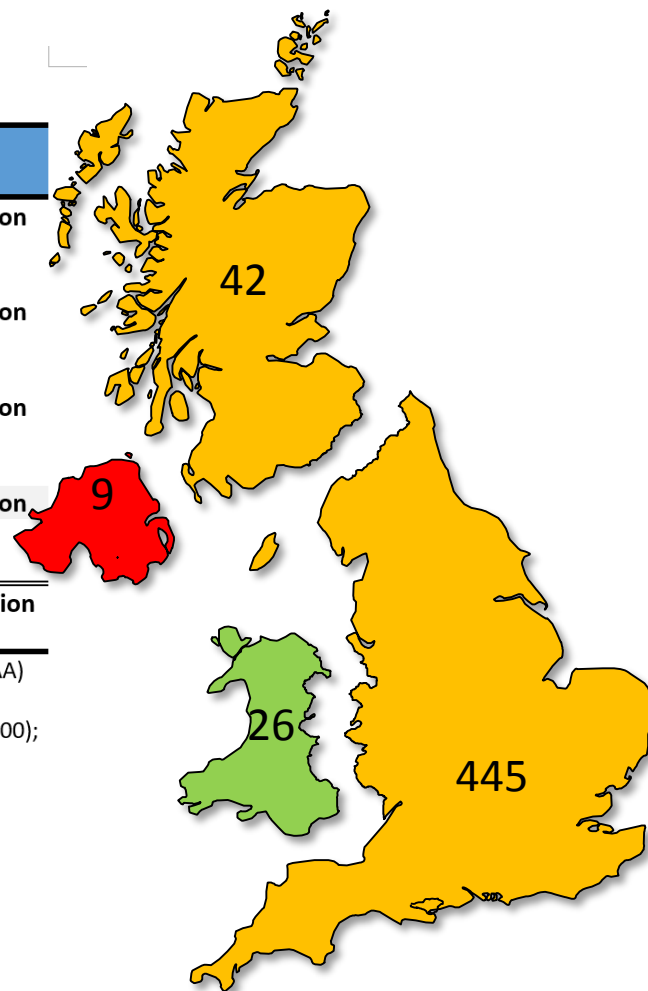
Workforce Change 2013 to 2018

United Kingdom Vascular Surgery Workforce (Consultants), Change 2013 to 2018 (5 Years).

Region	Consultants (2018)	Consultants (2013)	Change (5 Years)	Consultants (2018) per capita population
England	445	384	+61	1 per 124,987 population
Scotland	42	39	+3	1 per 129,162 population
Wales	26	22	+4	1 per 120,200 population
Northern Ireland	9	13	-4	1 per 207,867 population
United Kingdom	522	458	+64	1 per 126,514 population

Source: National Vascular Registry (2017) Vascular Surgeons who perform Abdominal Aortic Aneurysm (AAA) and Provision of Vascular Services (2018) which recommends Vascular Surgeon 1 per 100,000 capita of population. Office National Statistics (ONS) Population mid-year estimate 2018: United Kingdom (66,040,200); England (55,619,400); Scotland (5,424,800); Wales (3,125,200); Northern Ireland (1,870,800).

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates>.

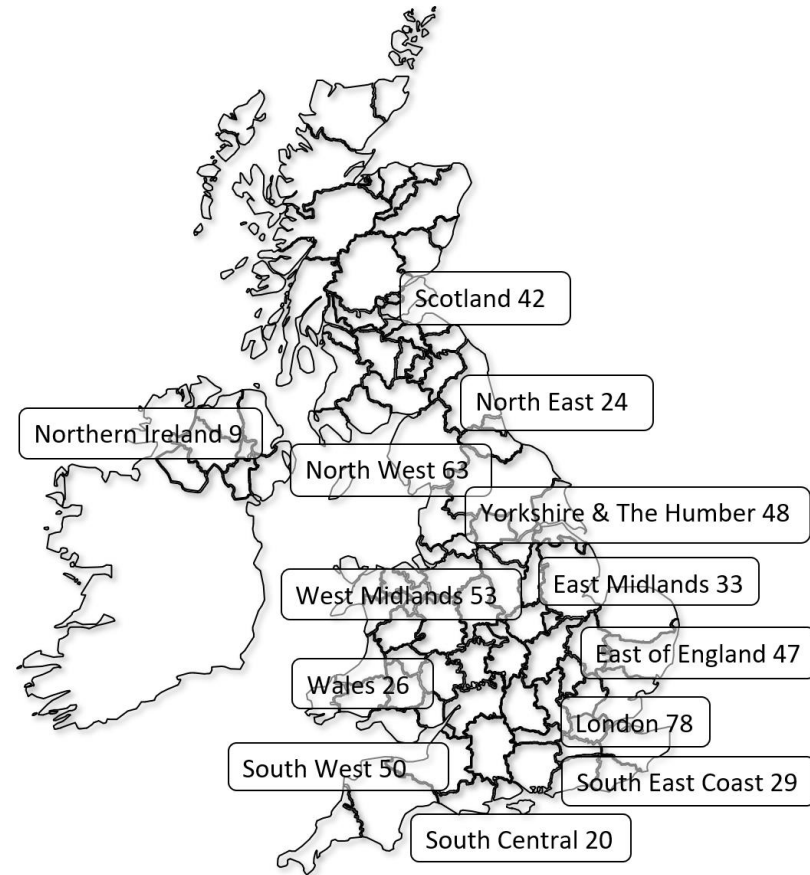


Workforce by UK Regions

United Kingdom Vascular Surgery Workforce (Consultants), by Region per Capita Population (2018).

Region	Consultants (2018)	Population (2018)	Consultants (2018) per capita population
East Midlands	33	4,771,666	1 per 144,596
East of England	47	6,168,432	1 per 131,243
London	78	8,825,001	1 per 113,141
North East	24	2,644,727	1 per 110,196
North West	63	7,258,627	1 per 115,216
South West	50	5,559,316	1 per 111,186
South Central*	20*	-	-
South East Coast~	29~	-	-
South East (includes*~)	49 (*~)	9,080,825 (includes*~)	1 per 185,323
West Midlands	53	5,860,706	1 per 110,579
Yorkshire & The Humber	48	5,450,130	1 per 113,544
England	445	55,619,400	1 per 124,987
Scotland	42	5,424,800	1 per 129,162
Wales	26	3,125,200	1 per 120,200
Northern Ireland	9	1,870,800	1 per 207,867
United Kingdom	522	66,040,200	1 per 126,514 population

United Kingdom Vascular Surgery Workforce, 2018.



Source: National Vascular Registry (2017) Vascular Surgeons who perform Abdominal Aortic Aneurysm (AAA) and Provision of Vascular Services (2018) which recommends Vascular Surgeon 1 per 100,000 capita of population. Office National Statistics (ONS) Population mid-year estimate 2018: United Kingdom (66,040,200); England (55,619,400); Scotland (5,424,800); Wales (3,125,200); Northern Ireland (1,870,800).

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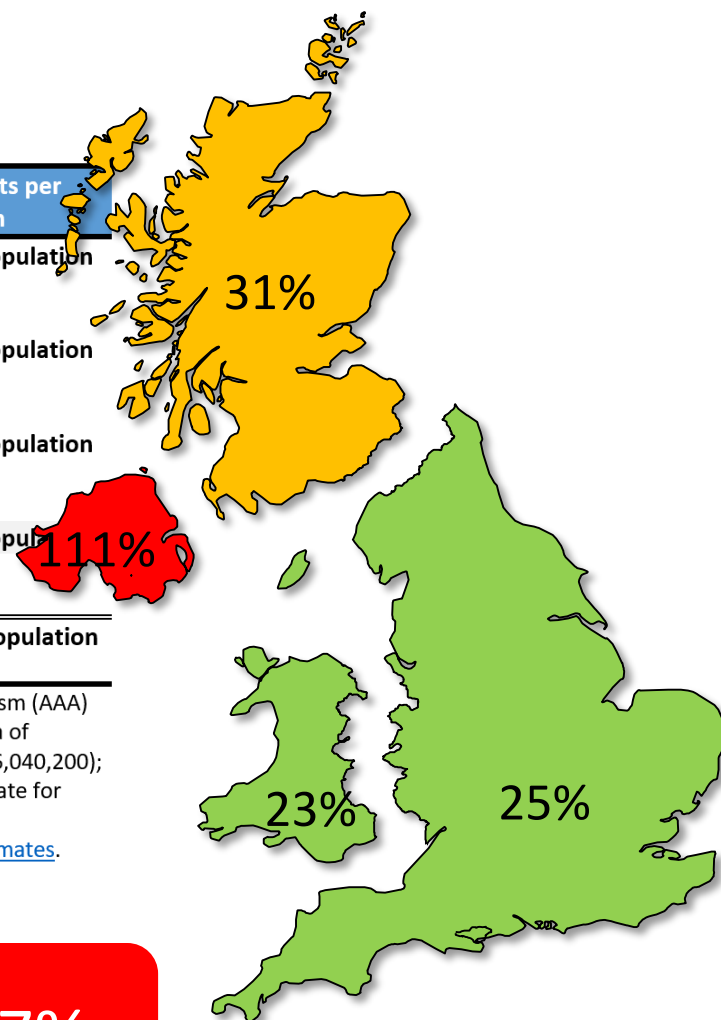
Workforce Change to 1 per 100,000

United Kingdom Vascular Surgery Workforce (Consultants), change needed to achieve recommended target of Vascular Surgeons, 1 per 100,000 Population.

Region	Consultants (2018)	Consultants (Target)	Change (Number)	Change (%)	Target Consultants per capita population
England	445	557	+112	(25%)	1 per 100,000 population
Scotland	42	55	+13	(31%)	1 per 100,000 population
Wales	26	32	+6	(23%)	1 per 100,000 population
Northern Ireland	9	19	+10	(111%)	1 per 100,000 population
United Kingdom	522	663	+141	(27%)	1 per 100,000 population

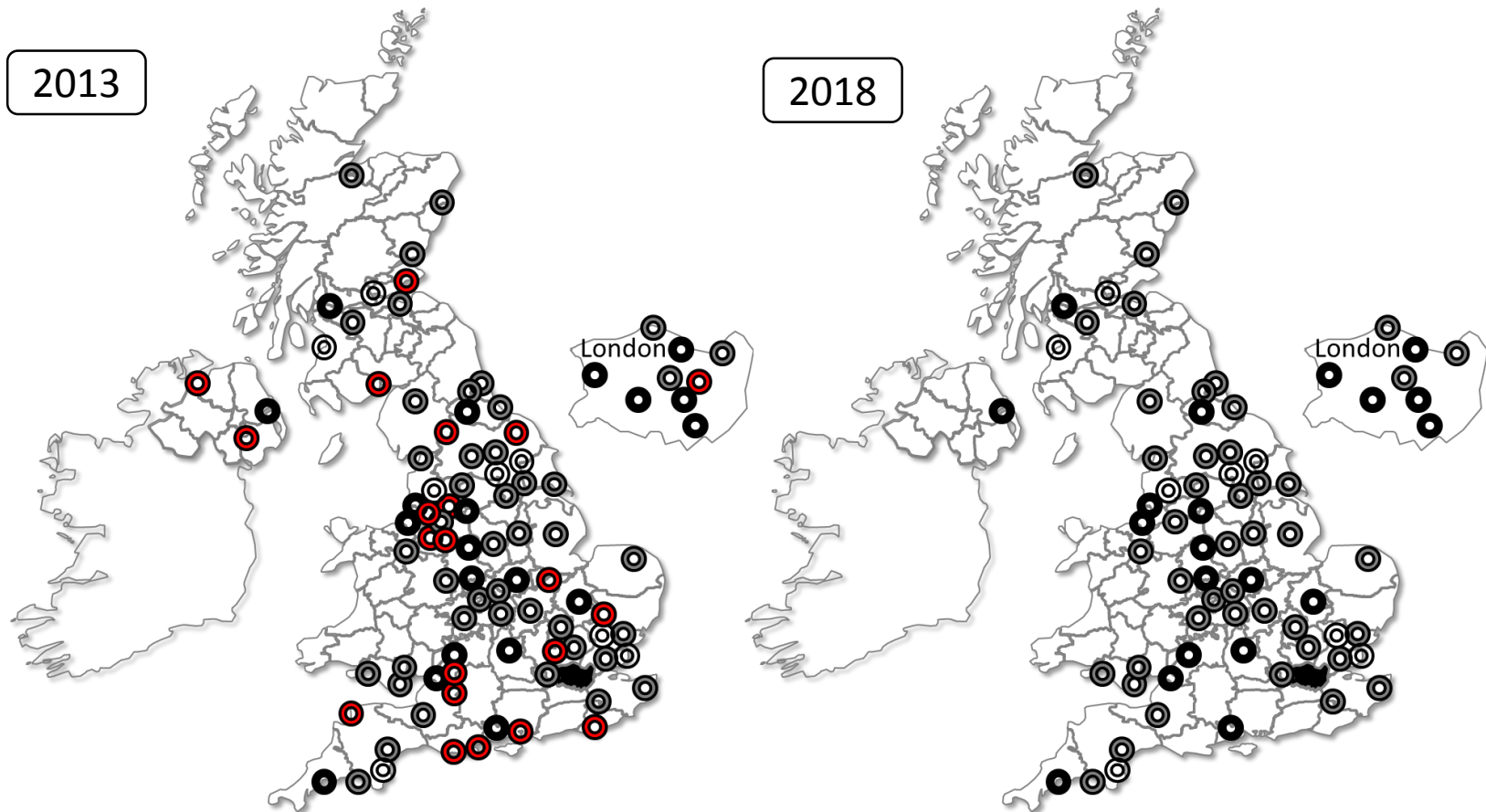
Source: National Vascular Registry (2017) Vascular Surgeons who perform Abdominal Aortic Aneurysm (AAA) and Provision of Vascular Services (2018) which recommends Vascular Surgeon 1 per 100,000 capita of population. Office National Statistics (ONS) Population mid-year estimate 2018: United Kingdom (66,040,200); England (55,619,400); Scotland (5,424,800); Wales (3,125,200); Northern Ireland (1,870,800). Estimate for Change for Expansion rounded up to next whole consultant surgeon.

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates>.



Increase 522 to 663 (+141) or 27%

Reconfiguration 2013-2018



UK from 2013 (95) to 2018 (74) Arterial Hubs (-21)

UK Workforce Diversity

	Male	Female
Consultants 2013	92.5%	7.5%
Consultants 2018	90%	10%
NTN	83%	17%
Consultants (New)	81%	19%



Equalities Act 2010

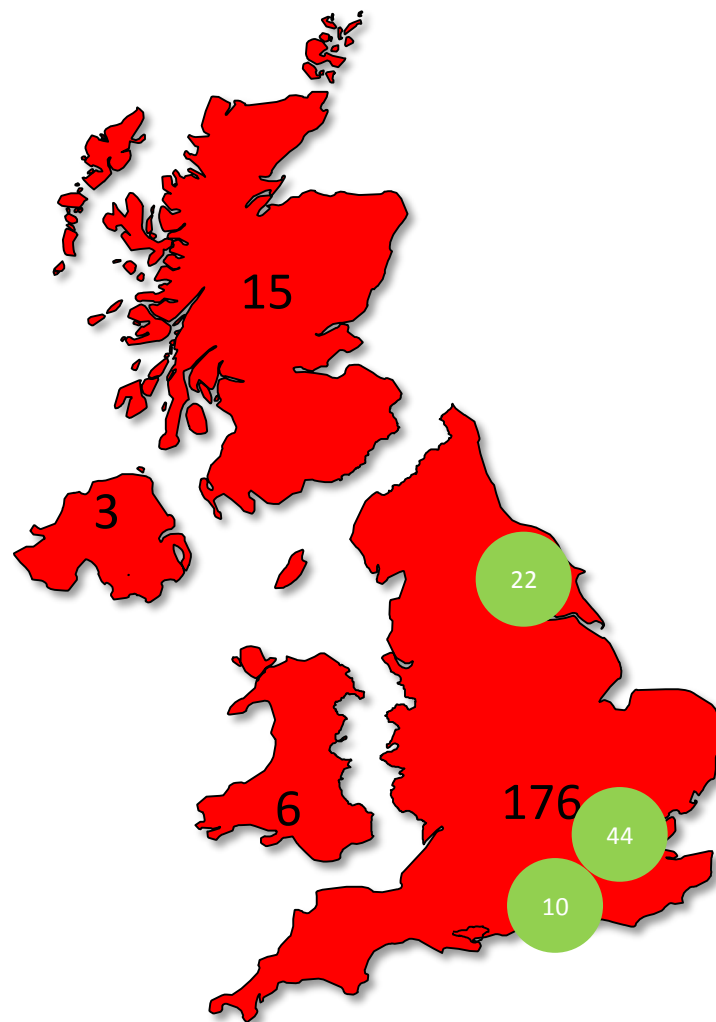


Trainees Actual and (Predicted 0.4)

United Kingdom Vascular Surgery Workforce (Trainees), by Region (Predicted) in 2018.

Region	Consultants (2018)	Population (2018)	Trainees (predicted by ratio 0.4)
East Midlands	33	4,771,666	11 (13)
East of England	47	6,168,432	13 (19)
London	78	8,825,001	44 (31)
North East	24	2,644,727	10 (10)
North West	63	7,258,627	21 (25)
South West	50	5,559,316	7 (20)
South Central*	20*	-	10 (8)*
South East Coast~	29~	-	7 (12)~
South East (includes*~)	49 (*~)	9,080,825 (includes*~)	11 (20)
West Midlands	53	5,860,706	20 (21)
Yorkshire & The Humber	48	5,450,130	22 (19)
England	445	55,619,400	176 (178)
Scotland	42	5,424,800	15 (17)
Wales	26	3,125,200	6 (10)
Northern Ireland	9	1,870,800	3 (4)
United Kingdom	522	66,040,200	200

Source: National Vascular Registry (2017) Vascular Surgeons who perform Abdominal Aortic Aneurysm (AAA) and Provision of Vascular Services (2018) which recommends Vascular Surgeon 1 per 100,000 capita of population. Office National Statistics (ONS) Population mid-year estimate 2018: United Kingdom (66,040,200); England (55,619,400); Scotland (5,424,800); Wales (3,125,200); Northern Ireland (1,870,800).
<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates>.



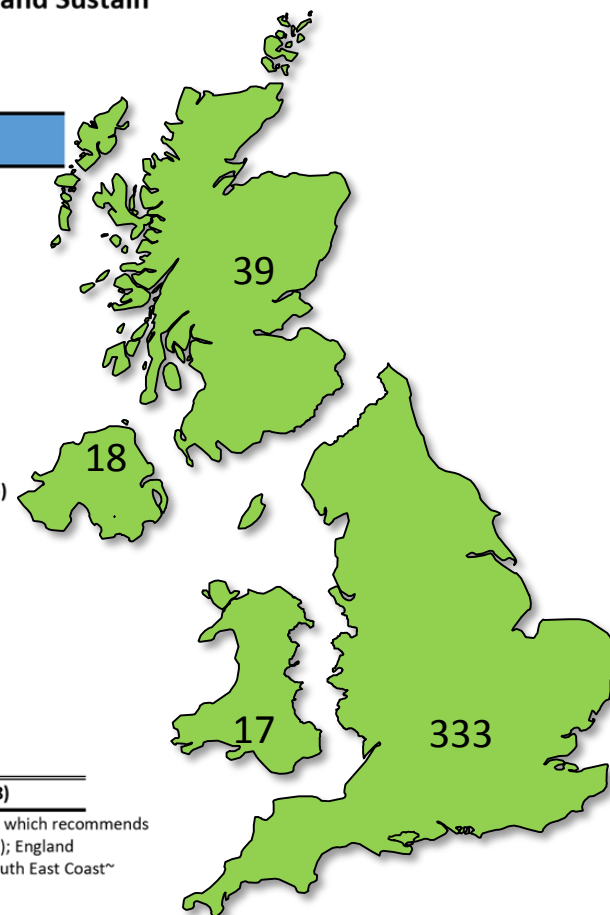
Trainees Demand

Table 6. United Kingdom Vascular Surgery Workforce (Trainees), by Region to Achieve and Sustain Recommended Consultants per Capita Population (2018).

United Kingdom Vascular Surgery Workforce (Trainees), by Region to Achieve and Sustain recommended Consultants per Capita Population (2018).

Region	Population (2018)	Consultants (2018)	Trainees (Ratio 0.4)	If Consultants (1 per 100,000)	NTN (+138) Expansion	NTN (Ratio 0.4) Maintenance	NTN Total
East Midlands	4,771,666	33	13	48 (+15)	+15	19	34
East of England	6,168,432	47	19	62 (+15)	+15	25	40
London	8,825,001	78	31	88 (+10)	+10	35	45
North East	2,644,727	24	10	26 (+2)	+2	10	12
North West	7,258,627	63	25	73 (+10)	+10	29	39
South West	5,559,316	50	20	56 (+6)	+6	22	28
South Central*	-	(20)*	(8)*	(37)*	(+17)*	(15)*	(22)*
South East Coast~	-	(29)~	(12)~	(53)~	(+24)~	(21)~	(45)~
South East (includes*~)	9,080,825*~	49	20	90 (+41)	+41	36	77
West Midlands	5,860,706	53	21	59 (+6)	+6	24	30
Yorkshire & The Humber	5,450,130	48	19	55 (+7)	+7	22	29
England	55,619,400	445	178	556 (+111)	+111	222	333 (+155)
Scotland	5,424,800	42	17	54 (+12)	+12	27	39 (+22)
Wales	3,125,200	26	10	31 (+5)	+5	12	17 (+7)
Northern Ireland	1,870,800	9	4	19 (+10)	+10	8	18 (+14)
United Kingdom	66,040,200	522	209	660 (+138)	+138	269	407 (+198)

Source: National Vascular Registry (2017) Vascular Surgeons who perform Abdominal Aortic Aneurysm (AAA) and Provision of Vascular Services (2018) which recommends Vascular Surgeon 1 per 100,000 capita of population. Office National Statistics (ONS) Population mid-year estimate 2018: United Kingdom (66,040,200); England (55,619,400); Scotland (5,424,800); Wales (3,125,200); Northern Ireland (1,870,800). South East Administrative Region contains South Central* and South East Coast~ Training Regions. South <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates>.



UK Demand Vascular NTN Estimate

Low 269 (45 per year) / High 407 (68 per year)

Vascular Surgery CCT

General (Vascular Sub-specialty) 2014

Vascular Special Interest

AAA repair	15 (including 10 open - elective or emergency)
carotid endarterectomy	30
infra-inguinal bypass	60
varicose vein surgery	60

(some AAA repairs should be endovascular)

Vascular Surgery 2016

Procedure	level	number
Open Aortic procedures (elective)	4	10
Open aortic aneurysm (emergency)	4	5
Endovascular Aortic aneurysm (elective)	4	10
Femoro-distal bypass	4	10
Carotid Endarterectomy	4	10
Venous and endovenous surgery	4	20

AHA Medical/Scientific Statement

Position Statement

Training Standards for Physicians Performing Peripheral Angioplasty and Other Percutaneous Peripheral Vascular Interventions

**A Statement for Health Professionals From the Special
Writing Group of the Councils on Cardiovascular Radiology,
Cardio-Thoracic and Vascular Surgery, and Clinical
Cardiology, the American Heart Association**

David C. Levin, MD, Chairman; Gary J. Becker, MD; Gerald Dorros, MD; Jerry Goldstone, MD;
Spencer B. King III, MD; James M. Seeger, MD; James B. Spies, MD;
John A. Spittell Jr., MD; and Lewis Wesley, MD, Members

* Documented performance of 100 diagnostic peripheral angiograms, 50 peripheral percutaneous transluminal angioplasty procedures, and 10 peripheral arterial thrombolysis procedures under the direct supervision of

**UK VASCULAR SURGEONS
SET-STANDARD COMPETENCE
TREATMENT VASCULAR DISEASE**

UK VS WFS 2018: Scope Practice

Figure 37. Scope of Operations Performed.

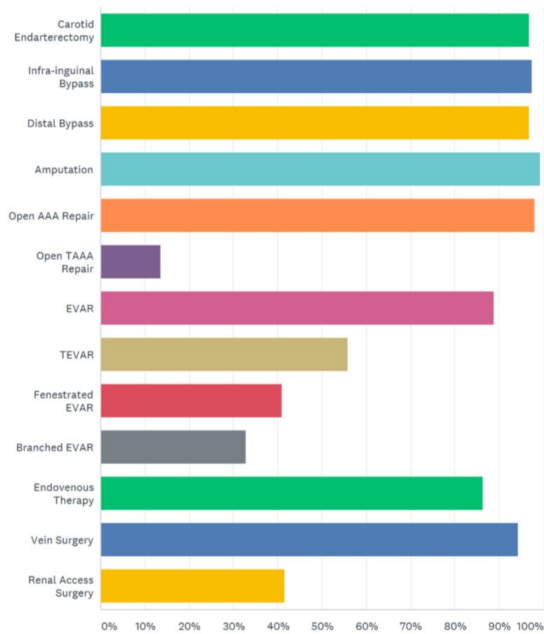


Figure 39. Percentage Surgeons performing Peripheral Angioplasty by Career Stage.

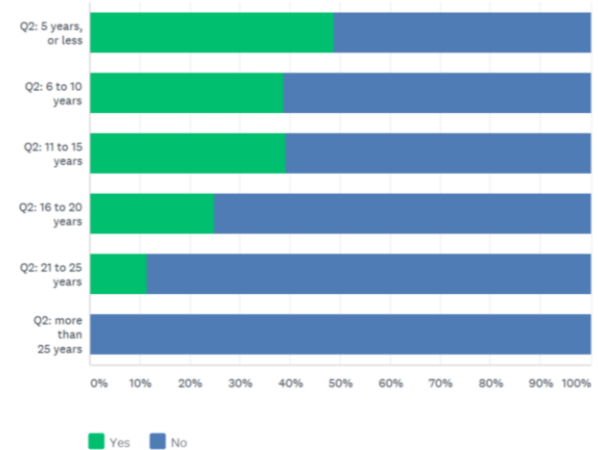
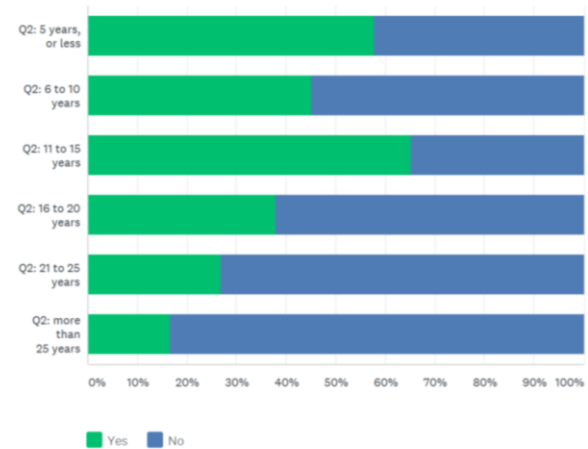


Figure 40. Percentage Surgeons performing complex EVAR.



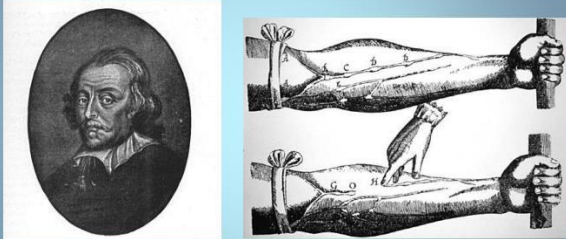
UK VASCULAR SURGEONS:

- 90% EVAR
- 40% COMPLEX EVAR
- 40% ANGIOPLASTY

Endovascular Interventions

PHYSICIAN

William Harvey



Circulation of the Blood

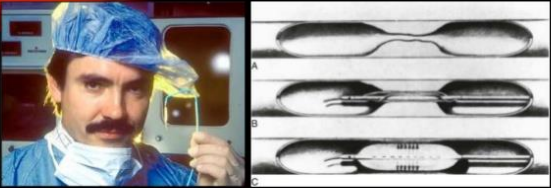
This block features a portrait of William Harvey on the left and two anatomical diagrams on the right. The diagrams show a human arm with a tourniquet applied to the upper arm, illustrating the flow of blood through the veins and arteries. The text 'Circulation of the Blood' is centered below the diagrams.

RADIOLOGIST



Charles Dotter : Father of Interventional Radiology. Performed first angioplasty using a system of serial dilators in 1964

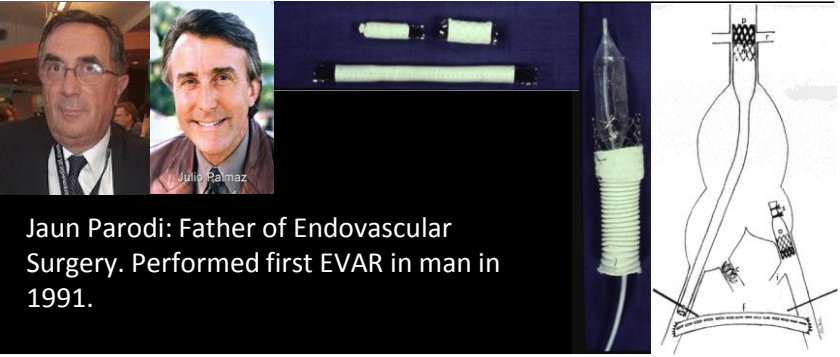
This block contains a black and white portrait of Charles Dotter on the left. To his right are three vertical angiogram images showing the internal structure of blood vessels. Below the images is a caption identifying him as the father of interventional radiology and noting his 1964 angioplasty procedure.



Andreas Gruentzig - German Cardiologist. Invented the Angioplasty Balloon in 1977

This block features a color photograph of Andreas Gruentzig on the left, wearing a blue surgical cap and mask. To his right are three images of different angioplasty balloons. A caption below the images identifies him as the inventor of the angioplasty balloon in 1977.

CARDIOLOGIST



Jaun Parodi: Father of Endovascular Surgery. Performed first EVAR in man in 1991.

This block includes a color portrait of Jaun Parodi on the left. To his right are images of endovascular devices, including a long, thin catheter and a stent. On the far right is a schematic diagram of a human torso showing the placement of an endovascular aneurysm repair (EVAR) in the abdominal aorta. A caption below the images identifies him as the father of endovascular surgery and notes his first EVAR in 1991.

SURGEON

UK VS WFS 2018: Endovascular

Figure 23. Specialist vascular surgery training by Career Stage.

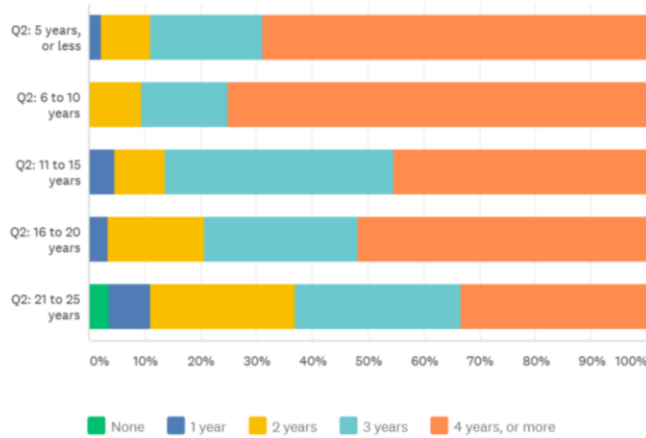


Figure 27. Endovascular Training Fellowships by Location and Career Stage.

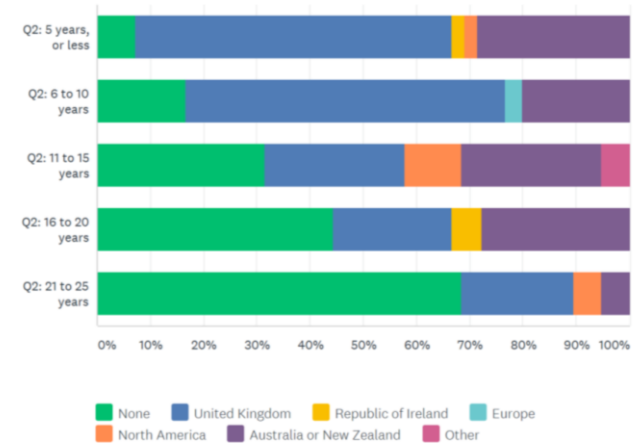
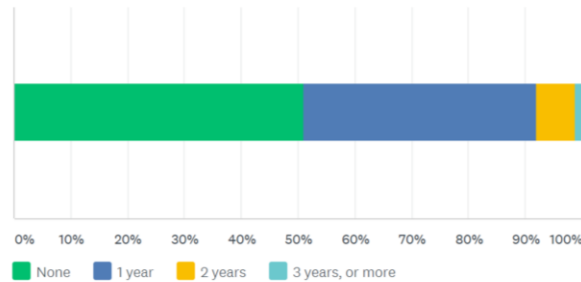


Figure 24. Additional out of programme training in vascular surgery.



**UK VASCULAR SURGEONS
ARE TRAINED & TEACHERS
ENDOVASCULAR THERAPY**

Workforce 2028



- More
- More Diverse
- More Mature
- More Travelled
- Multi-Skilled
- Multi-Disciplinary
- Sub-Specialised
- Technologically Advanced

MORE EVOLVED