

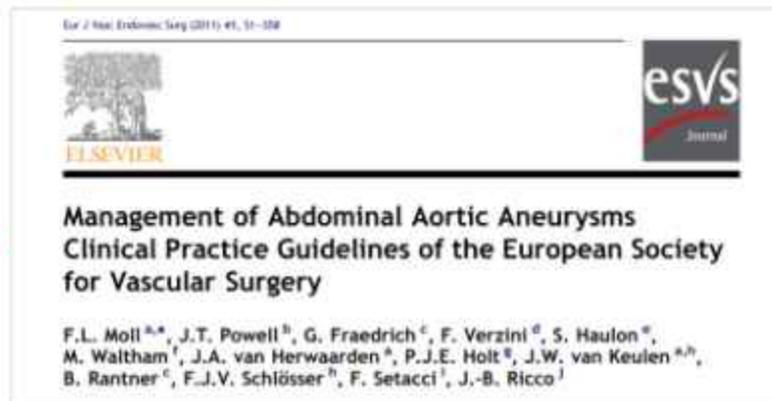
The 2024 ESVS AAA guidelines

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ESVS Clinical Practice Guidelines on the Management of Abdominal Aortic Aneurysms

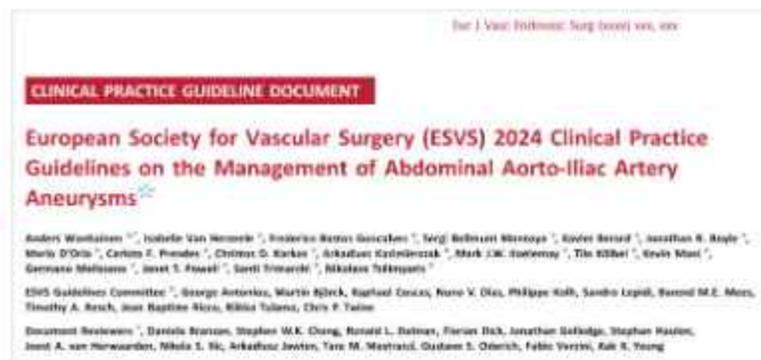
2011



2019



2024



The new ESVS 2024 Clinical Practice Guidelines on the Management of Abdominal Aorto-iliac Artery Aneurysms

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From 15 countries

The new ESVS 2024 Clinical Practice Guidelines on the Management of Abdominal Aorto-iliac Artery Aneurysms

160 recommendations

- 59 new (including 7 class I)
- 43 changed
- 57 unchanged

1 275 references

- 474 new references published between 2019 and 2023
- 16 primary or secondary analyses from RCTs
- 106 systematic reviews and or meta-analyses
- 84 studies based on vascular registries

Level of Evidence

- 8/160 (5%) Level A evidence, of which five are Class I and two are Class III
- 111 (69%) Level C evidence or consensus

Grading of Recommendations

Table 2. Class of recommendations from the European Society of Cardiology (ESC) evidence grading system.

Class	Definition	Suggested wording
I	Evidence and or general agreement that a given treatment or procedure is beneficial, useful, effective	is recommended (should)
II	Conflicting evidence and or divergence of opinion about the usefulness/efficacy about the given treatment or procedure.	
IIa	Weight of evidence/opinion is in favour of usefulness/efficacy	should be considered
IIb	Usefulness/efficacy is less well established by evidence/opinion	may be considered
III	Evidence or general agreement that a given treatment or procedure is not useful/effective and in some cases may be harmful	is not recommended (is not indicated)

Table 3. Levels of evidence adapted from the European Society of Cardiology (ESC) evidence grading system.

Level of Evidence A	Data derived from multiple randomised trials or meta-analyses of randomised trials
Level of Evidence B	Data derived from a single randomised trial, large non-randomised studies, or a meta-analysis of non-randomised studies
Level of Evidence C	Consensus opinion of experts and or small studies, retrospective studies, registries

Screening

Recommendation 11 (Changed)	Class	Level
Ultrasound screening for the early detection of abdominal aortic aneurysm is recommended in high risk populations* to reduce death from aneurysm rupture.	I	A

*	Men	Women
65 year-old	+	-
65 year-old former or current smoker	++	-
Non-white ethnicity	-	-
First degree relatives with AAA	+++	+++
Other peripheral aneurysms	+++	+++
Cardiovascular disease	-	-
Organ transplanted	++	++

Surveillance of Small AAA

Recommendation 13 (Changed)	Class	Level
Men should be considered for imaging surveillance using ultrasound every five years for a sub-aneurysmal aorta 25-29 mm in diameter, every three years for abdominal aortic aneurysms 30-39 mm in diameter, annually for aneurysms 40-49 mm, and every six months for aneurysms ≥ 50 mm, taking into account life expectancy, suitability for future repair and patient preferences.	IIa	B

Recommendation 14 (Changed)	Class	Level
Women should be considered for imaging surveillance using ultrasound every five years for a sub-aneurysmal aorta 25-29 mm in diameter, every three years for abdominal aortic aneurysms 30-39 mm in diameter, annually for aneurysms 40-44 mm, and every six months for aneurysms ≥ 45 mm, taking into account life expectancy, suitability for future repair and patient preferences.	IIa	C

Surveillance of Small AAA

Aorta and Major Branches

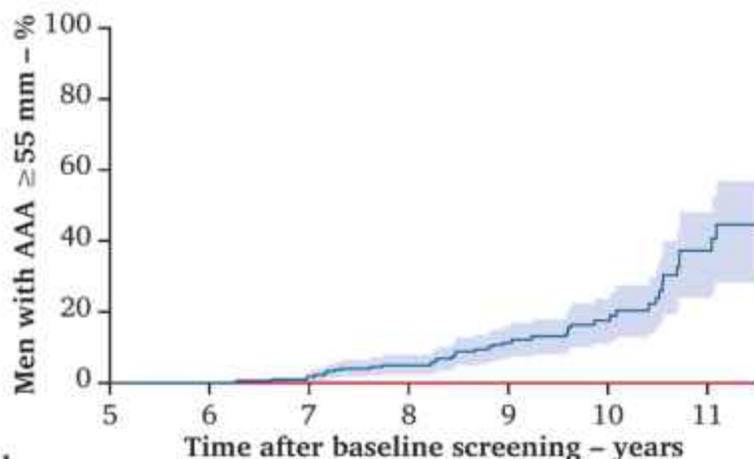
Eur J Vasc Endovasc Surg (2011) 42, 380–386



POPULATION BASED DATA

Long Term Outcome of Screen Detected Sub-Aneurysmal Aortas in 65 Year Old Men: a Single Scan After Five Years Identifies Those at Risk of Needing AAA Repair

Knut Thorbjörnsen^{1,2,3,4}, Sverker Sverrisdóttir^{1,2,3,4}, Nils Peter Gilgen^{1,2}, Anders Warhaugen^{1,2}



No. at risk:

— AAA ≥ 30 mm	384	326	279	200	141	84	39
— SAA < 30 mm	301	126	102	81	68	53	10

Aorta and Major Branches

Eur J Vasc Endovasc Surg (2013) 47, 444

SYSTEMATIC REVIEW

Editor's Choice – Systematic Review and Meta-Analysis of Contemporary Abdominal Aortic Aneurysm Growth Rates

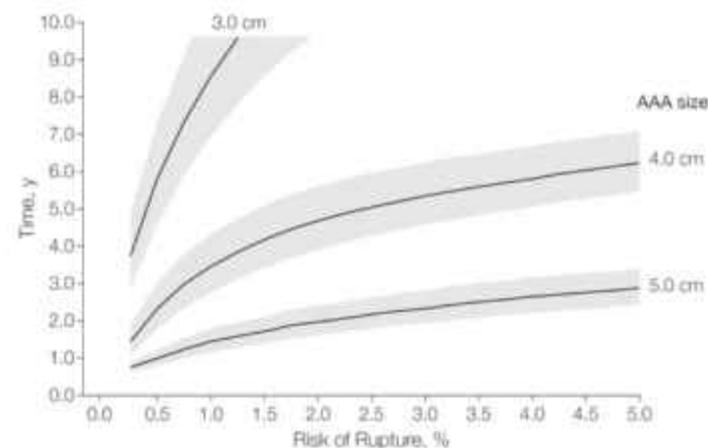
Carola F. Pineda^{1,2}, Ryan Gosselin de Melo¹, Daniel Costello¹, Mark O'Donoghue¹, Mikko Tallema¹, Mark Kallam¹, Subhojit Ghosh¹, Anders Warhaugen^{1,2}

Surveillance Intervals for Small Abdominal Aortic Aneurysms A Meta-analysis

The RESCAN Collaborators*

JAMA, February 27, 2013—Vol 309, No. 8

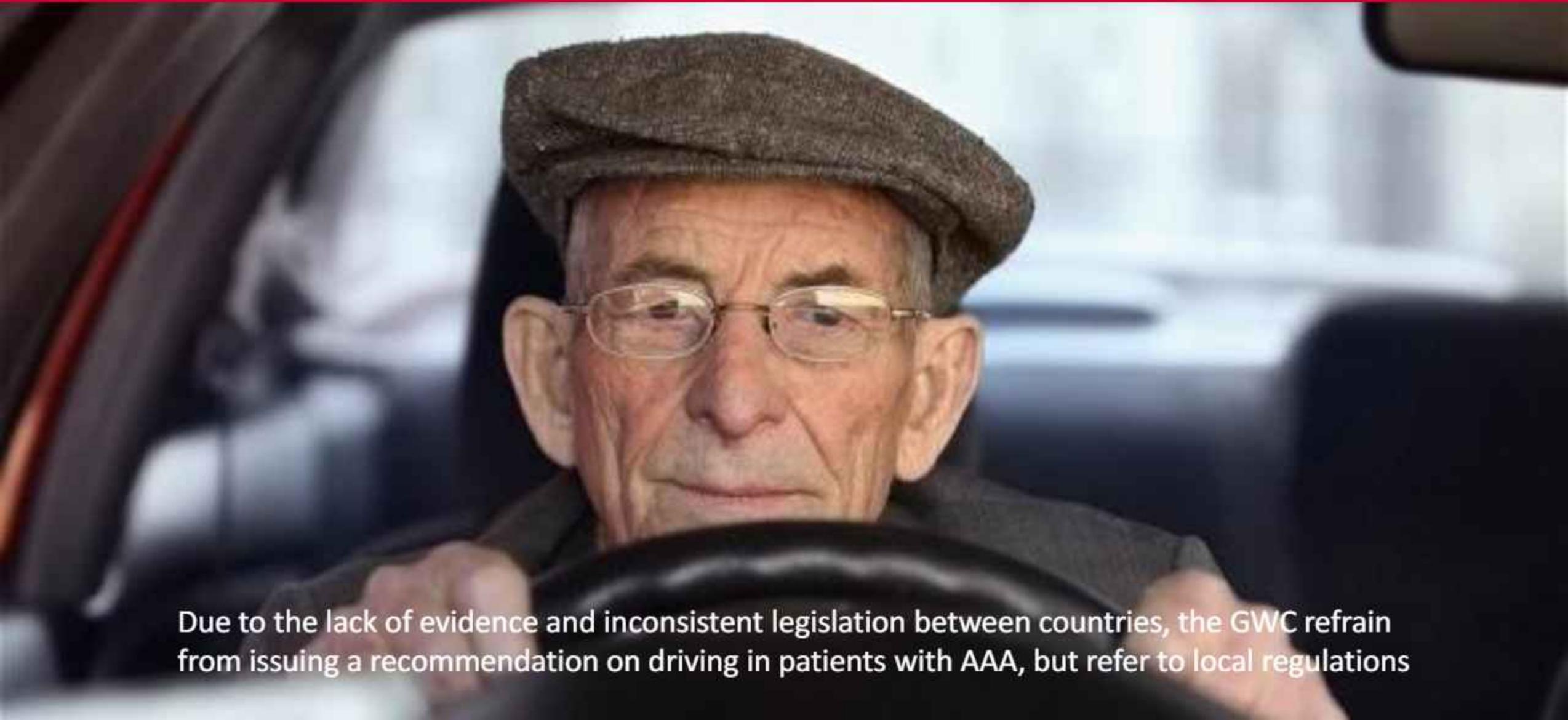
Figure 3. Time Intervals Between AAA Surveillance Scans and the Risk of Rupture by Baseline AAA Diameter in Men



Medical Management

Recommendation 16 (Changed)	Class	Level
All patients with an abdominal aortic aneurysm should receive cardiovascular risk factor management with smoking cessation*, blood pressure control*, statin and antiplatelet therapy*, and lifestyle advice (including exercise and healthy diet).	I	B
Recommendation 18 (New)	Class	Level
Having a small abdominal aortic aneurysm is not a contraindication to using Fluoroquinolone antibiotics.	III	B
Recommendation 19 (New)	Class	Level
Restricting exercise or sexual activity in patients with small abdominal aortic aneurysms* is not indicated.	III	B

Suitability to drive for patients with AAA



Due to the lack of evidence and inconsistent legislation between countries, the GWC refrain from issuing a recommendation on driving in patients with AAA, but refer to local regulations

Original article

Daniele Bisacco ^{1,2}, Tim J. Mandigers ^{1,2,3}, Laura Savaré ^{1,2,3}, Maurizio Domello ^{1,2}, Mario D'Orta ¹, Francesca Ieva ^{1,2,3}, Joost A. Van Herwaarden ¹, Kevin Mori ¹, Anders Wanhainen ¹, Sanni Triinarti ^{1,2}

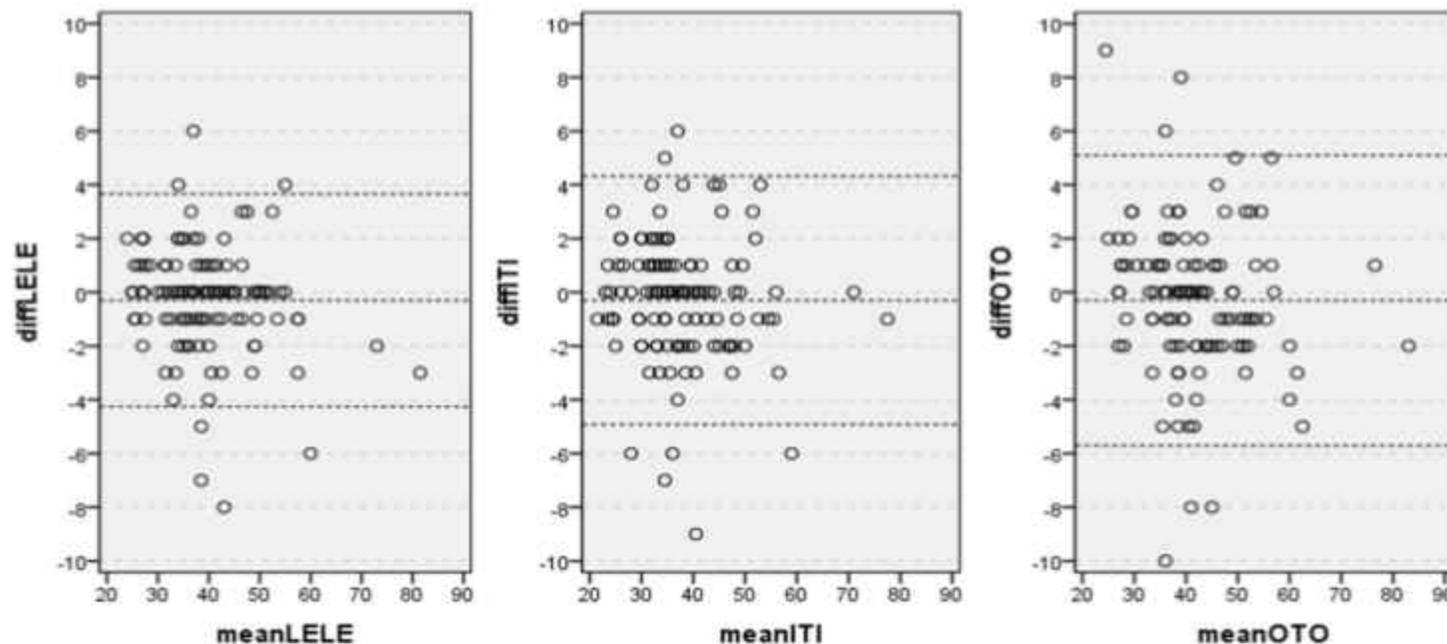
Comparison of three ultrasound methods of measuring the diameter of the abdominal aorta

M. Gürtelschmid^{1,2}, M. Björck¹ and A. Wanhainen¹

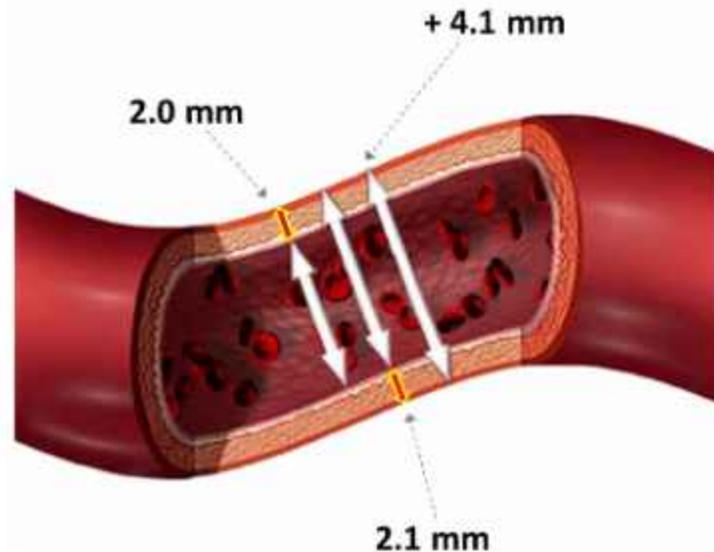
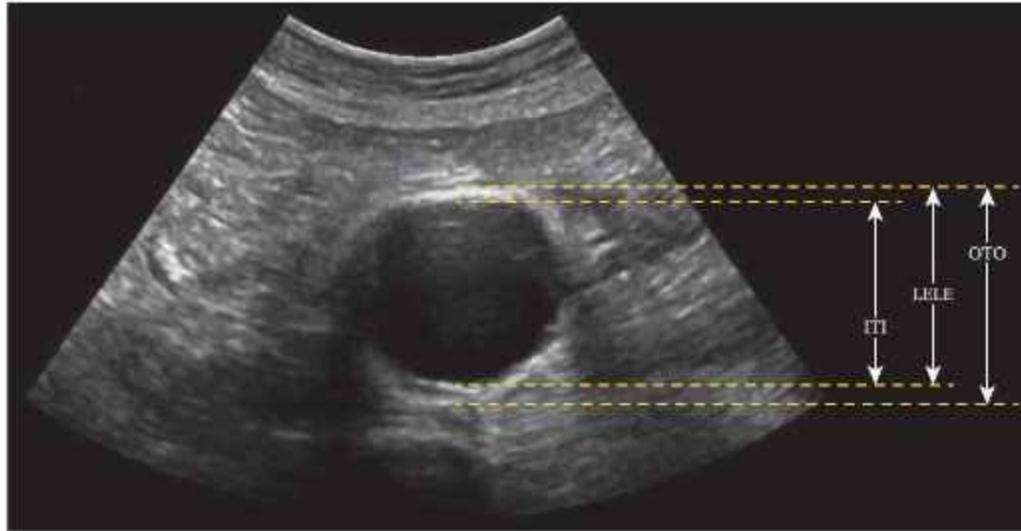
¹Department of Surgical Sciences, Section of Vascular Surgery, Uppsala University Hospital, Uppsala, and ²Department of Surgery, Mälarsjukhuset, Eskilstuna, Sweden

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Variability according to Bland & Altman



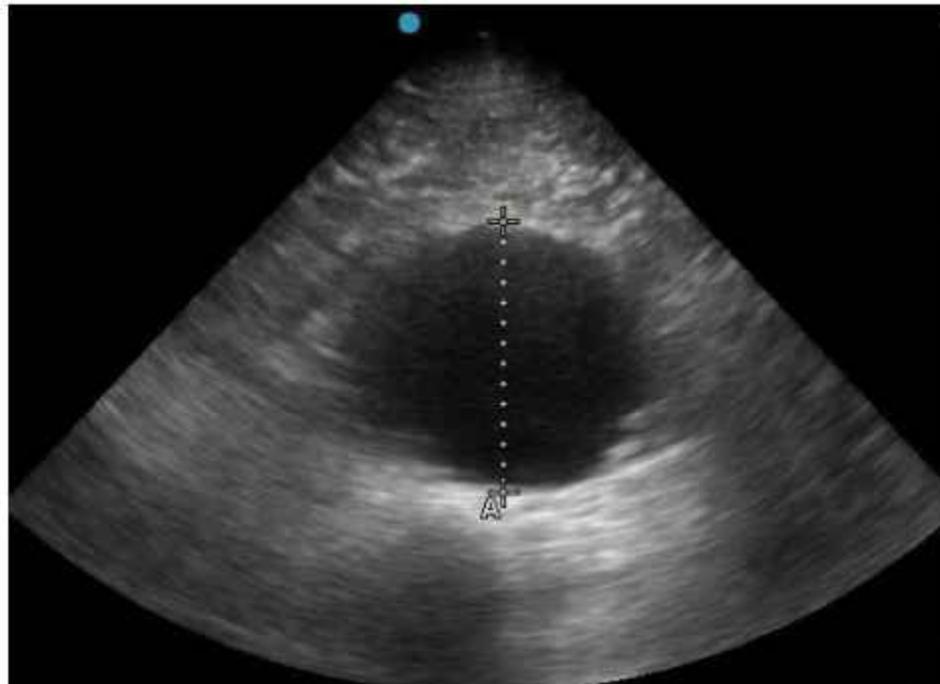
Calliper placement - differences



- Compared with ITI, the prevalence increases by 31% using LELE and by 77% using OTO
- OTO is thus more sensitive in diagnosing a diseased aorta, and aortas with sub-aneurysmal diameters (25-29 mm) based on OTO will have less risk of becoming clinically relevant later.
- However, OTO measurements cause the threshold for repair to be reached earlier, which is not desirable.
- ITI, on the other hand, has the advantage of providing the most relevant measure of threshold for repair with fewer unnecessary operations on small AAAs, and has proven to be safe in the UK screening programme.
- However, with ITI it is important to ensure a strict follow up schedule for sub-aneurysmal aortic dilatation, since these may be at a greater risk of becoming an AAA requiring repair

Timing of CTA

Recommendation 9 (Changed)	Class	Level
Computed tomography angiography is recommended for treatment planning once the anteroposterior diameter threshold for elective abdominal aortic aneurysm repair has been met on ultrasound, and for the diagnosis of rupture.	I	C



Threshold for Elective AAA repair

In men the risk of rupture is very low (0.3-0.8% per year) for AAAs with a diameter below 55 mm measured with US, which translates to a diameter on CTA between 55-62 mm depending on which measurement methodology is used

Recommendation 20 (New)	Class	Level
Men with an asymptomatic abdominal aortic aneurysm < 55 mm are not recommended for elective repair	III	A
Recommendation 22 (Changed)	Class	Level
Men with an abdominal aortic aneurysm \geq 55 mm should be considered for elective repair.	IIa	C

Threshold for Elective AAA repair

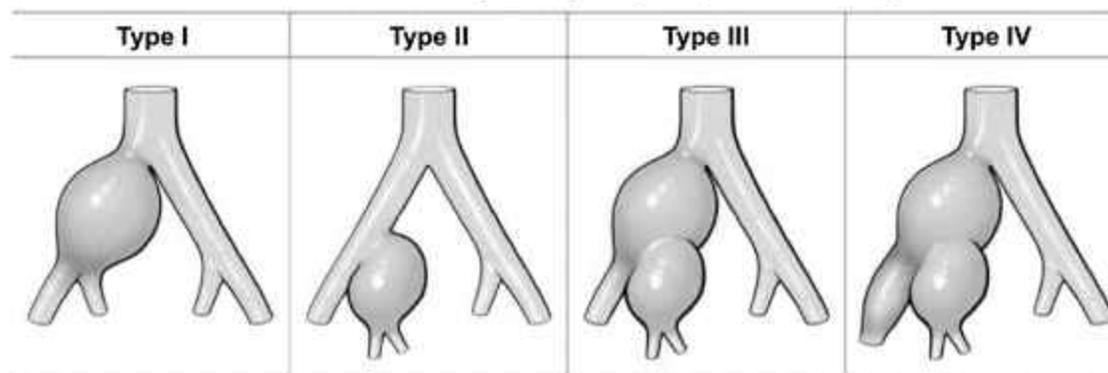
Women had a fourfold greater rupture risk for all AAA sizes

Recommendation 21 (New)	Class	Level
Women with an asymptomatic abdominal aortic aneurysm < 50 mm are not recommended for elective repair.	III	C
Recommendation 23 (Changed)	Class	Level
Women with an abdominal aortic aneurysm \geq 50 mm may be considered for elective repair.	IIb	C

Iliac Artery Aneurysm Repair

Recommendation 135 (Changed)	Class	Level
Patients with an iliac artery aneurysm (common iliac artery, internal iliac artery and external iliac artery, or combination thereof) should be considered for elective repair at a diameter of ≥ 40 mm.	IIa	C
Recommendation 134 (Changed)	Class	Level
The choice of surgical technique for iliac artery aneurysm repair should be considered individualised based on patient and lesion characteristics.	IIa	B

Isolated Iliac Artery Aneurysm (IIAA) Classification by Reber



Surgical Volume and Centralization

Recommendation 3 (Changed)	Class	Level
Centres performing abdominal aortic aneurysm repair should not have a yearly total caseload of <30, and not less than 15 of each by open and endovascular methods.	III	B
Recommendation 4 (New)	Class	Level
Centres treating complex abdominal aortic aneurysms should not have a yearly combined caseload of open and fenestrated/branched endovascular aortic repair of <20.	III	C
Recommendation 142 (New)	Class	Level
Patients with mycotic abdominal aortic aneurysms are recommended to be referred to high volume vascular surgical centres, for multidisciplinary management.	I	C
Recommendation 155 (Unchanged)	Class	Level
Referral to a multidisciplinary aortic team at a highly specialised centre is recommended to manage patients with an aortic disorder suspected of having an underlying genetic cause.	I	C

Also, **AGI** should be managed in high volume centres for multidisciplinary evaluation and treatment, *as recommended in the ESVS Clinical Practice Guidelines on the Management of Vascular Graft and Endograft Infections Guidelines (Class I, Level C)*

Surgical Volume and Centralization

7/29 (24%) centers >30 repair/year

Swedvasc 2022

130/501 (26%) centers >30 repair/year

Trenner et al. EJVES 2018

Training AAA

Recommendation 5 (New)

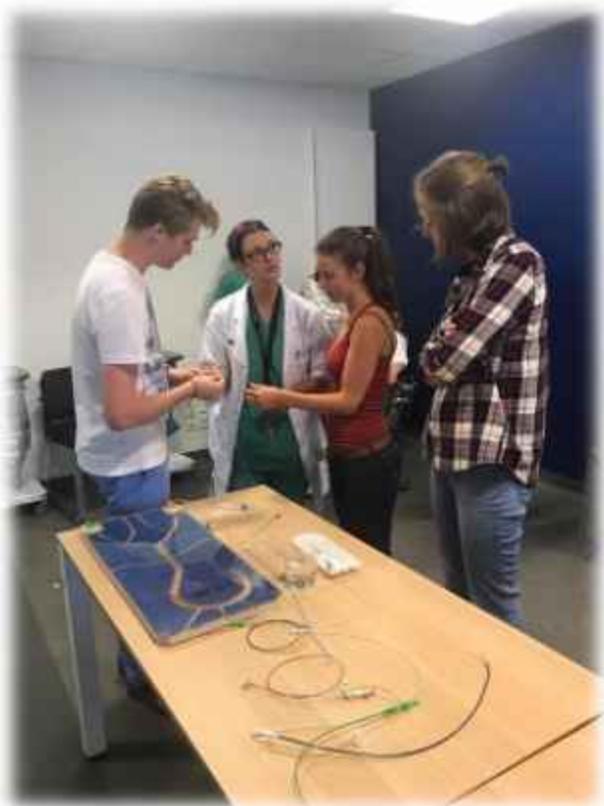
The vascular surgery training curriculum **should** include simulation based training in open and endovascular aortic repair.

Class

Level

I

B

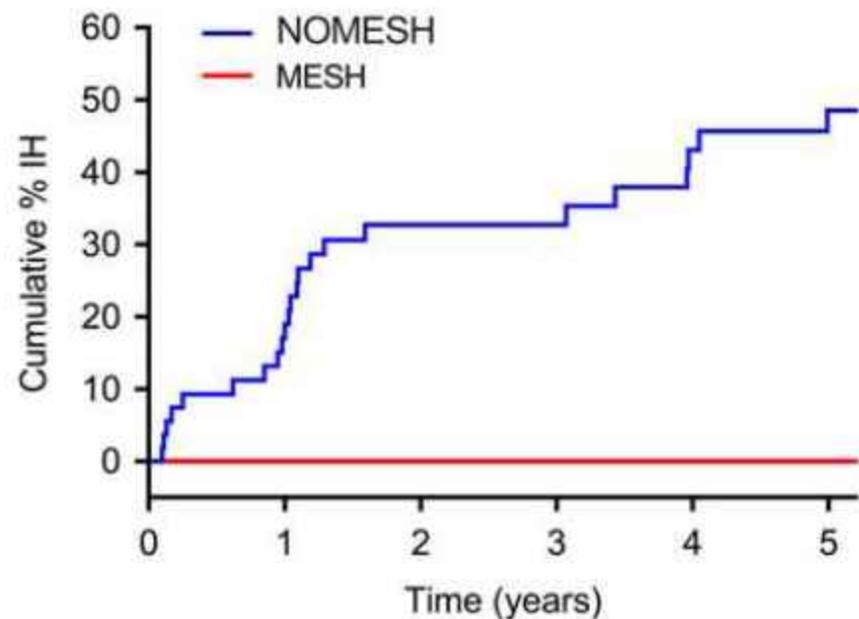


Elective Open Surgical Repair

Recommendation 49 (New)	Class	Level
For open abdominal aortic aneurysm repair, routine use of antimicrobial coated grafts to prevent aortic graft infection is not recommended .	III	B
Recommendation 50 (New)	Class	Level
For open abdominal aortic aneurysm repair, the choice of a midline vs. transverse or transperitoneal vs. retroperitoneal abdominal incision should be considered based on surgeon preference and patient factors.	IIa	B
Recommendation 51 (New)	Class	Level
Reconstruction of the left renal vein after its division during open abdominal aortic aneurysm repair may be considered if important collaterals have been sacrificed.	IIb	C
Recommendation 54 (Changed)	Class	Level
In open abdominal aortic aneurysm repair routine re-implantation of the inferior mesenteric artery is not indicated , but should be reserved for selected cases of suspected insufficient pelvic organ perfusion and the risk of colonic ischaemia.	III	C

Elective Open Surgical Repair – Closure

Cumulative Incidence of Incisional Hernia
The PRIMAAT Trial



N _{at risk}		0	1	2	3	4	5
	NOMESH	58	43	31	27	23	17
	MESH	55	52	44	38	37	30

Recommendation 55 (Changed)

For open abdominal aortic aneurysm repair, prophylactic use of mesh reinforcement of midline laparotomies **should be considered**.

Class

Ila

Level

A

Elective EVAR

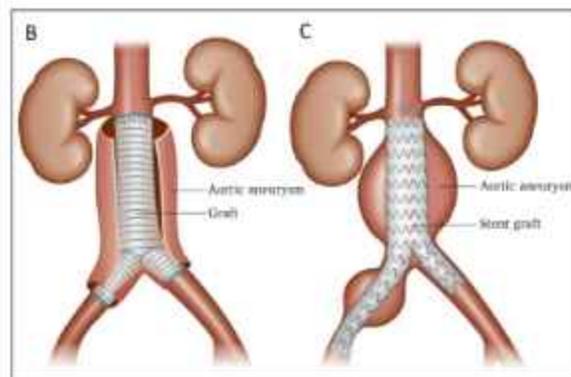
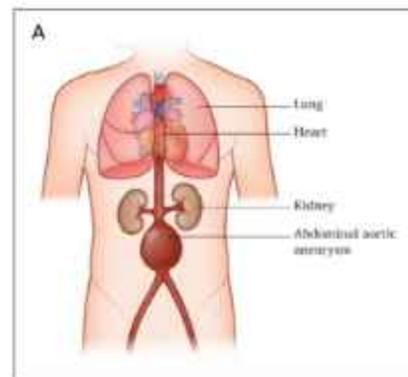
Recommendation 56 (New)	Class	Level
For endovascular abdominal aortic aneurysm repair, device selection should be considered based on aorto-iliac anatomy and the availability of unbiased long term durability data.	Ila	C
Recommendation 57 (New)	Class	Level
Endovascular abdominal aortic aneurysm repair outside the manufacturer's instruction for use is not recommended in the elective setting.	III	C
Recommendation 58 (Changed)	Class	Level
For newer generations of stent grafts for abdominal aortic aneurysm treatment based on existing platforms, such as low profile devices, long term follow up in prospective registries is recommended , to ensure device performance and procedural durability through 10 years .	I	C

Elective EVAR – Pre-emptive Embolisation

Recommendation 63 (New)	Class	Level
For patients undergoing endovascular abdominal aortic aneurysm repair, routine pre-emptive embolisation of accessory renal arteries is not indicated .	III	C
Recommendation 64 (New)	Class	Level
For patients undergoing endovascular repair of an abdominal aortic aneurysm, routine pre-emptive embolisation of the inferior mesenteric artery, lumbar arteries, and non-selective aneurysm sac embolisation is not indicated .	III	B

Open Surgical Repair or EVAR

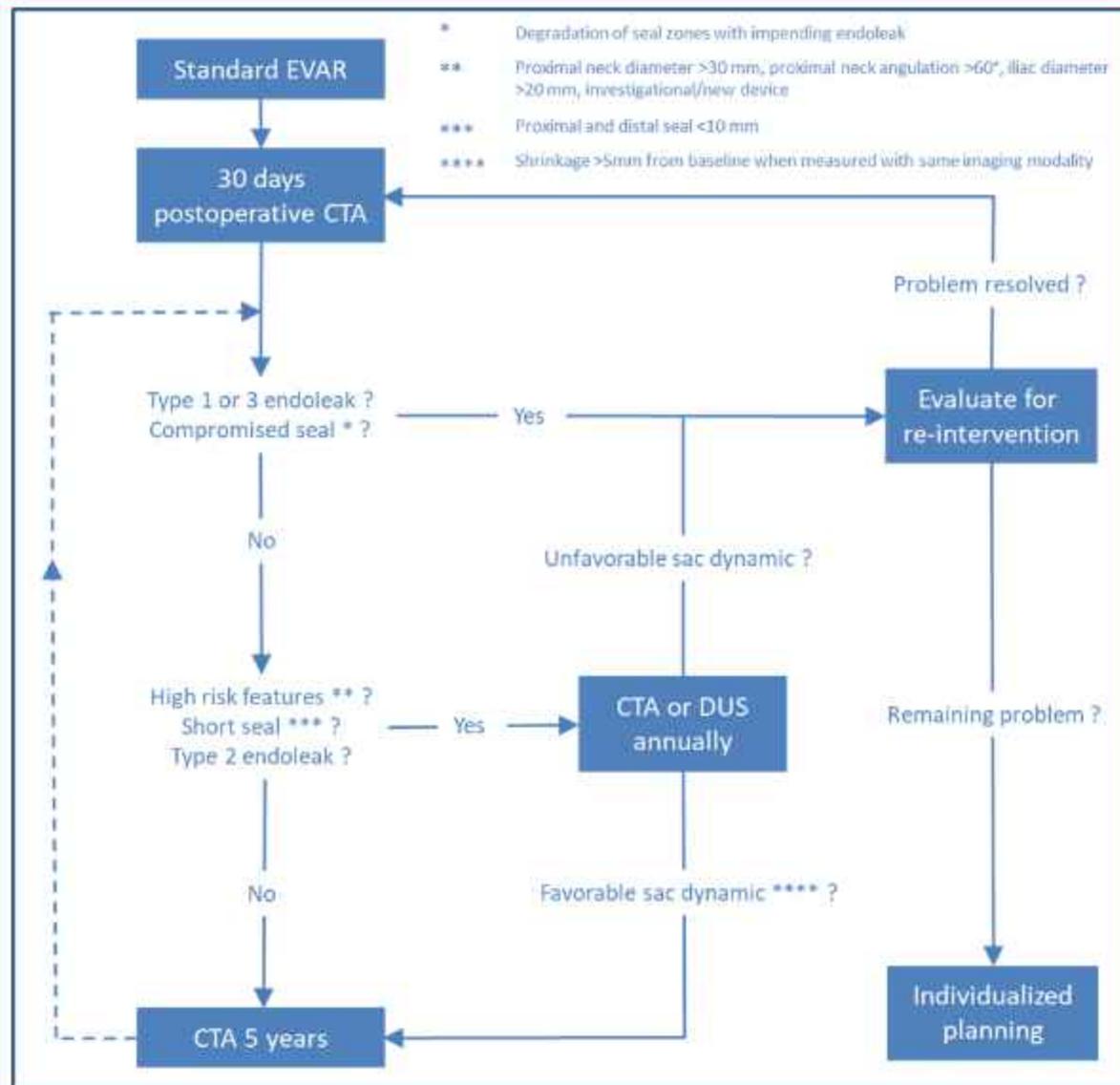
Recommendation 65 (Unchanged)	Class	Level
For most patients with suitable anatomy and reasonable life expectancy, endovascular repair should be considered the preferred treatment modality for elective abdominal aortic aneurysm repair.	IIa	B
Recommendation 66 (Unchanged)	Class	Level
For most patients with long life expectancy, open surgical repair should be considered as the preferred treatment modality for elective abdominal aortic aneurysm repair.	IIa	B



Ruptured AAA Repair

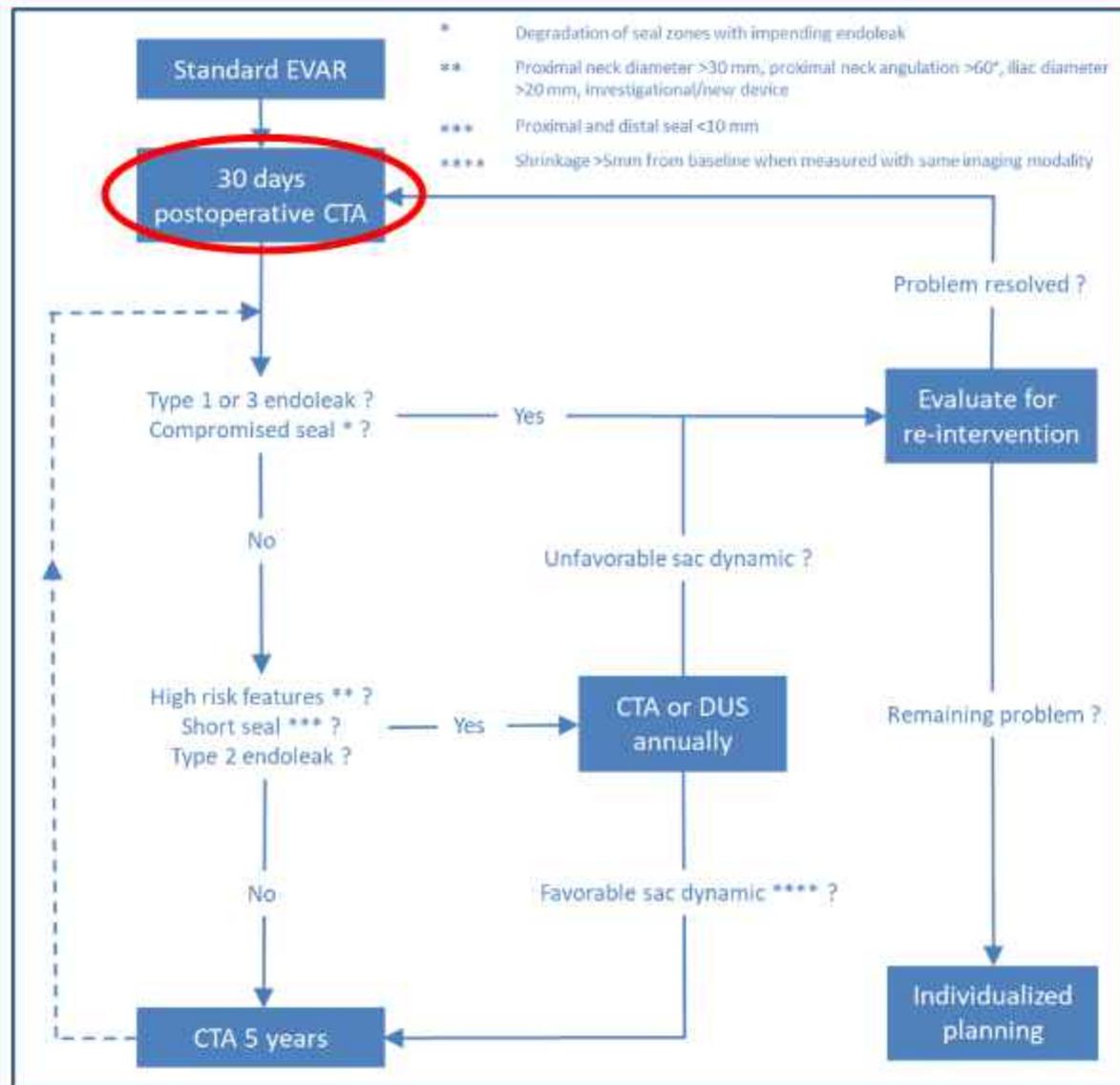
Recommendation 74 (Changed)	Class	Level
Haemodynamically unstable patients with a ruptured abdominal aortic aneurysm undergoing open or endovascular repair, may be considered for aortic balloon occlusion under fluoroscopy guidance to obtain proximal control.	IIb	C
Recommendation 76 (New)	Class	Level
Patients undergoing endovascular repair for a ruptured abdominal aortic aneurysm in whom imaging was performed during permissive hypotension, should be considered for stent graft oversizing of up to 30%.	IIa	C
Recommendation 80 (Changed)	Class	Level
For patients with a ruptured abdominal aortic aneurysm and suitable anatomy endovascular repair is recommended as the first line treatment option.	I	A

Follow-up after AAA Repair



New recommended follow up algorithm after standard EVAR

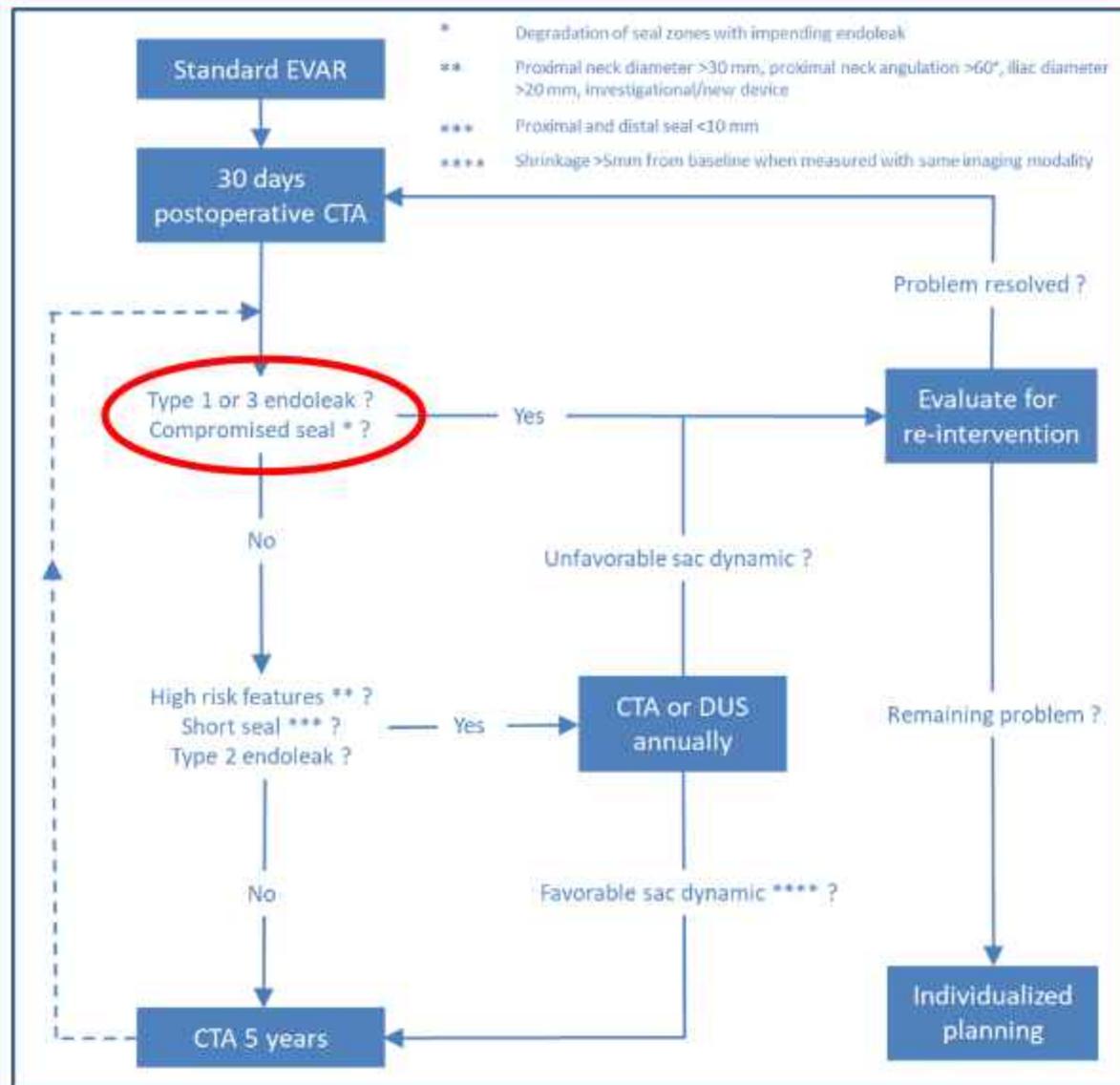
Follow-up after AAA Repair



Recommendation 113(Unchanged)	Class	Level
Patients who have undergone endovascular abdominal aortic aneurysm repair are recommended early post-operative imaging (within 30 days) using computed tomography angiography, to assess the presence of endoleak, component overlap and sealing zone length.	I	B

- **Low risk group** (no endoleak, anatomy within IFU, without high risk features (proximal neck diameter < 30 mm and angulation <60°, and iliac diameter < 20 mm), adequate overlap and seal of ≥ 10 mm proximal and distal stent graft apposition to arterial wall)
- **High risk group** (presence of T2EL, insufficient overlap or seal < 10 mm, anatomy outside IFU, large proximal neck (> 30 mm), ectatic iliac fixation zones (> 20 mm) or extreme angulation (> 60°))
- **EVAR failure group** (direct endoleak (Type 1 or 3 endoleak), obvious degradation of seal zones with impending endoleak, or aneurysm sac growth > 10 mm)

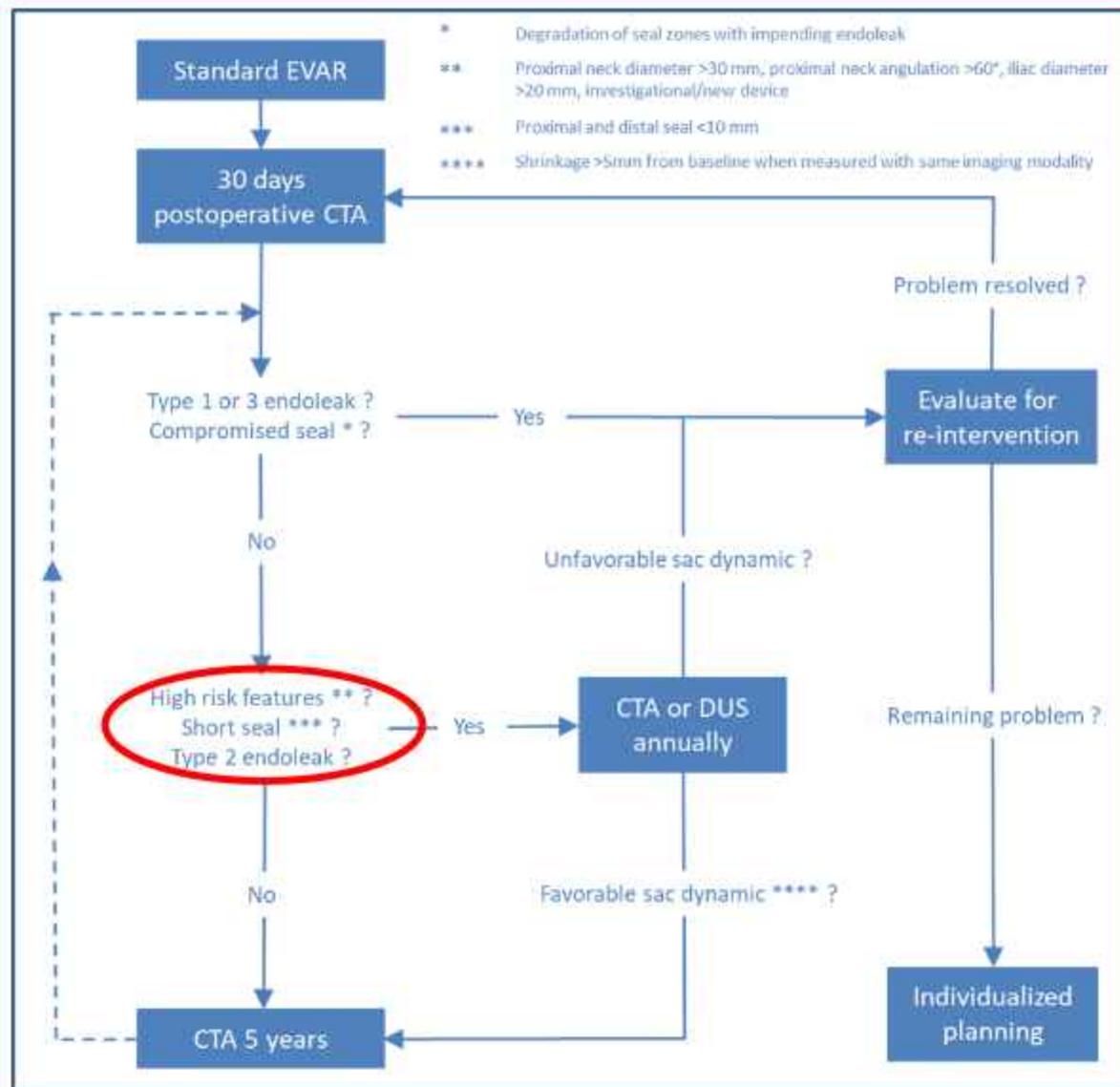
Follow-up after AAA Repair – Type 1 EL



Recommendation 104 (New)	Class	Level
Patients with compromised sealing zones * without visible endoleak after endovascular abdominal aortic aneurysm repair, may be considered for intervention to improve the seal, primarily by endovascular means.	IIb	C
Recommendation 105 (New)	Class	Level
For patients with a compromised proximal seal * after endovascular abdominal aortic aneurysm repair, proximal extension with fenestrated and branched devices should be considered in preference to other endovascular techniques.	IIa	C
Recommendation 106 (New)	Class	Level
For selected patients with a compromised proximal seal * after endovascular abdominal aortic aneurysm repair, elective open conversion may be considered as an alternative to complex endovascular interventions, provided the surgical risk is acceptable.	IIb	C

* inadequate seal (<10 mm) or progressive neck dilatation

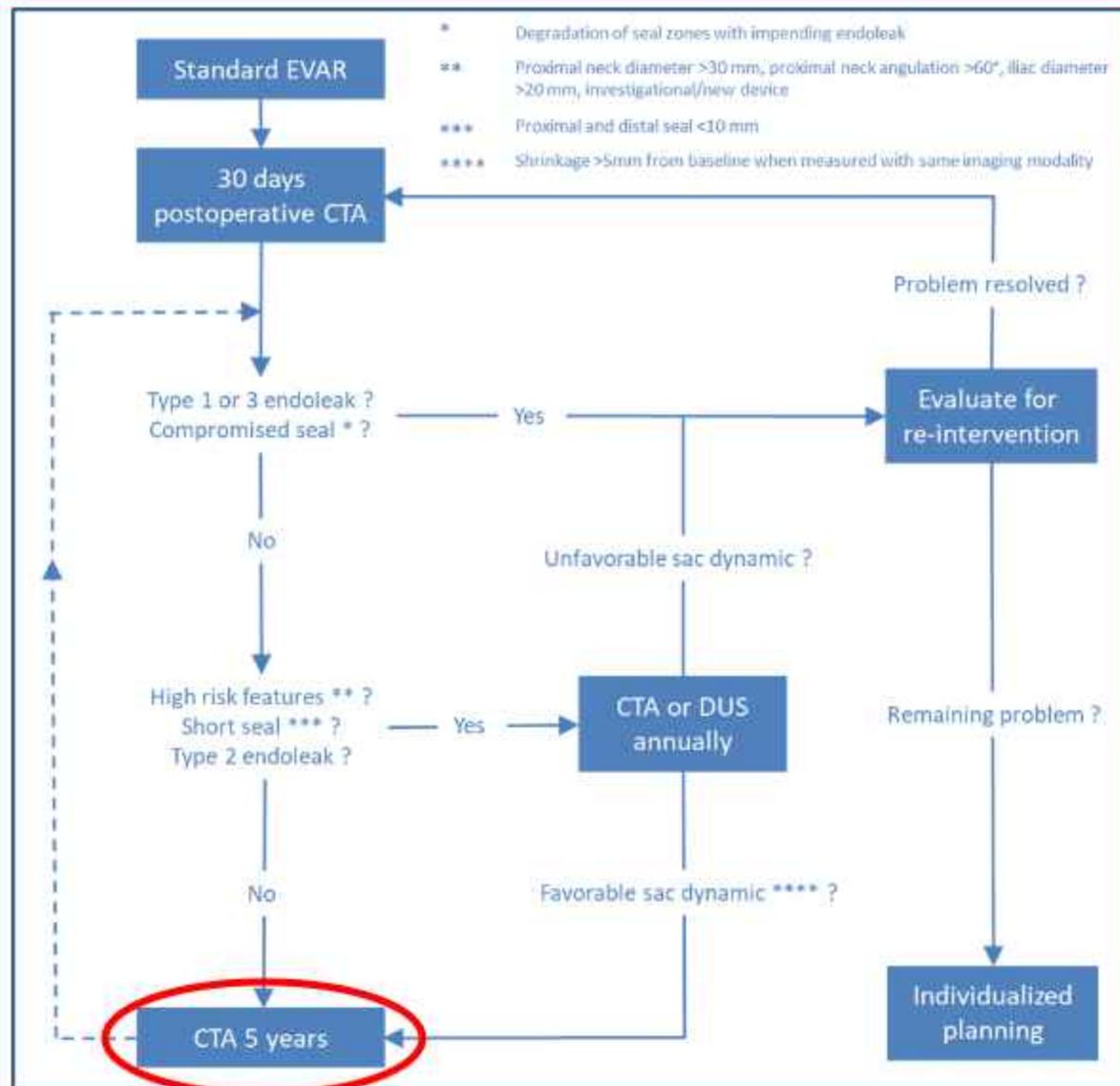
Follow-up after AAA Repair – Type 2 EL



Recommendation 107 (Changed)	Class	Level
Secondary intervention for a Type 2 endoleak after endovascular abdominal aortic aneurysm repair should only be considered in the presence of significant aneurysm sac growth (≥ 10 mm compared with baseline or with the smallest diameter during follow up using the same imaging modality and measurement method), primarily by endovascular means, provided alternative causes including Type 1 or 3 endoleaks have been excluded.	IIa	C

Recommendation 108 (New)	Class	Level
Patients with persistent aneurysm growth after endovascular attempt(s) to treat Type 2 endoleaks should be considered for elective open conversion with or without graft preservation.	IIa	C

Follow-up after AAA Repair – low risk

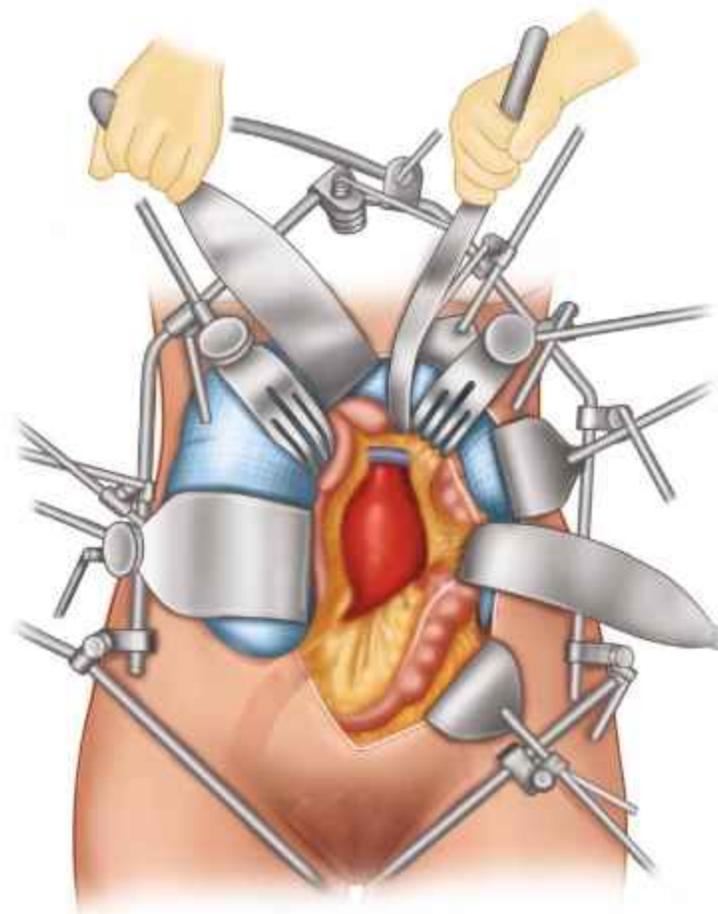
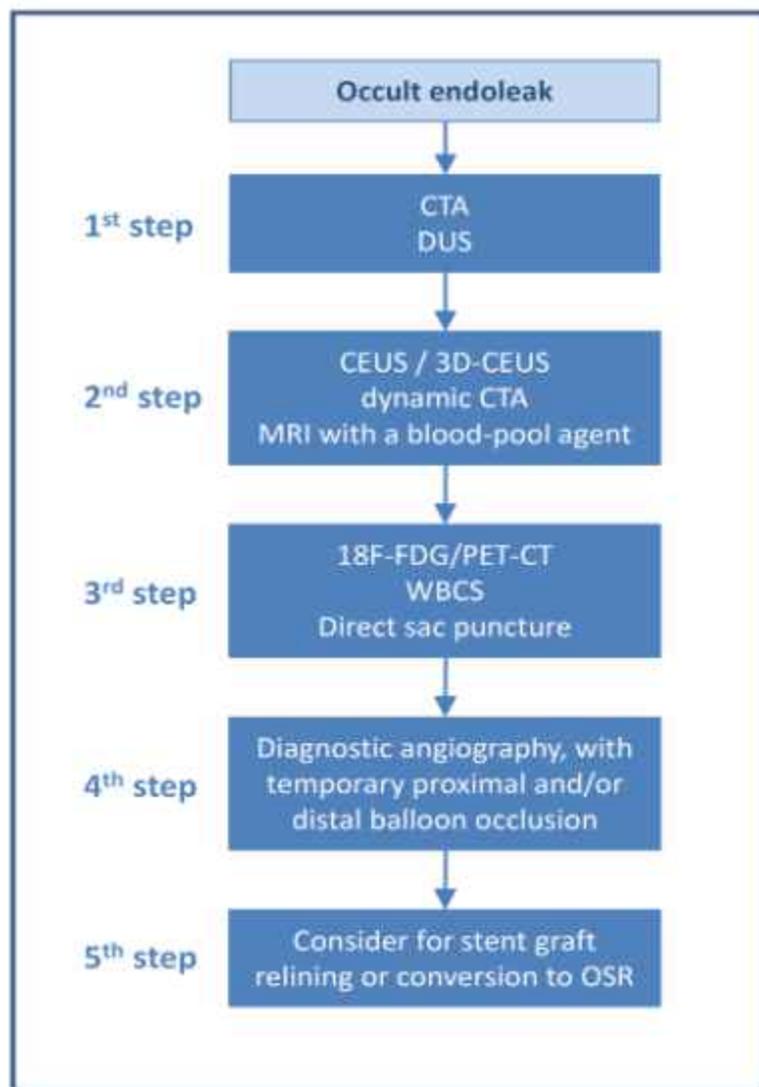


Recommendation 114 (Changed)	Class	Level
Patients who have undergone endovascular abdominal aortic aneurysm repair and have been stratified as low risk of complications * based on early post-operative computed tomography angiography, should be considered for low frequency imaging follow up during the first five years.	Ila	C

* no endoleak, anatomy within IFU, adequate overlap and seal of ≥ 10 mm proximal and distal stent graft apposition to arterial wall

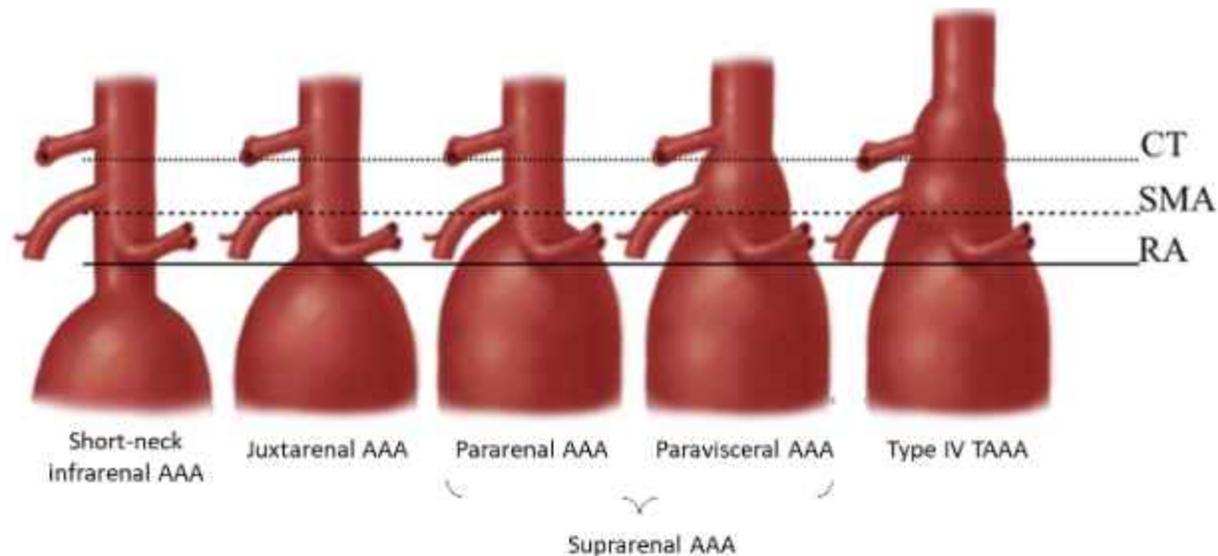
Recommendation 115 (New)	Class	Level
Patients who have undergone endovascular abdominal aortic aneurysm repair are recommended for long term imaging follow up (regardless of initial risk stratification), to detect late complications and identify late device failure and disease progression.	I	B

Diagnostic Step-up for Occult Undetermined Endoleak(s)



Management of Complex AAA – indication for repair

Recommendation 116 (Changed)	Class	Level
Patients with complex abdominal aortic aneurysms may be considered for elective repair at a diameter ≥ 55 mm in men and ≥ 50 mm in women, taking into account fitness for repair, aneurysm anatomy, and patient preferences.	IIb	C



Management of Complex AAA – elective repair

Recommendation 120 (Changed)	Class	Level
For patients with a complex abdominal aortic aneurysm and standard surgical risk, open or endovascular repair should be considered based on patient fitness, anatomy, and patient preference.	IIa	C

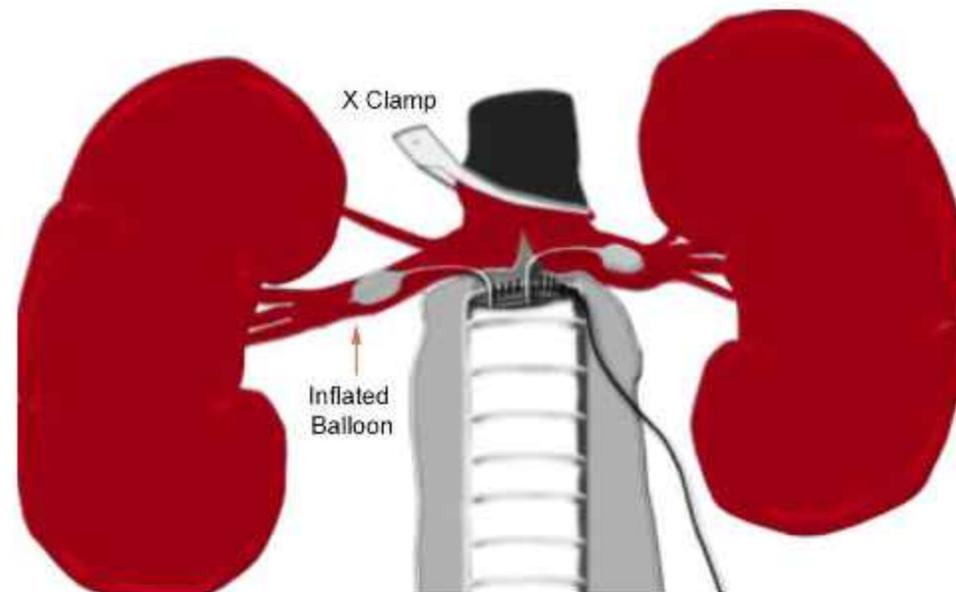
Recommendation 121 (Changed)	Class	Level
For patients with a complex abdominal aortic aneurysm and high surgical risk, endovascular repair with fenestrated and branched technologies should be considered as first line therapy.	IIa	C

Management of Complex AAA – elective repair

Recommendation 122 (Changed)	Class	Level
Endovascular repair for a complex abdominal aortic aneurysm, using parallel graft techniques should only be considered as an option in the emergency setting, or as a bailout, and ideally be restricted to ≤ 2 chimneys.	IIa	C
Recommendation 123 (Unchanged)	Class	Level
For patients with a complex abdominal aortic aneurysm, use of new techniques and concepts is not recommended in routine clinical practice, and should be limited to studies approved by research ethics committees, until adequately evaluated.	III	C

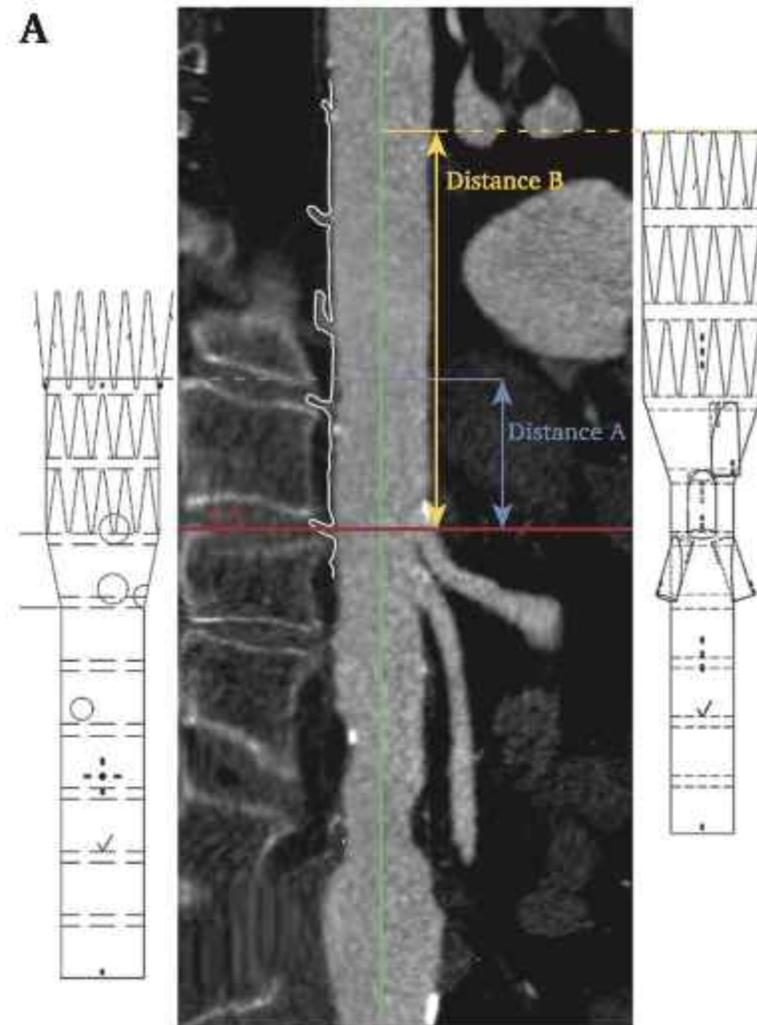
Management of Complex AAA – elective open repair

Recommendation 125 (Changed)	Class	Level
For patients undergoing open repair of a complex abdominal aortic aneurysm with a suprarenal <u>clamp time > 25 minutes</u> , cold renal perfusion should be considered .	IIa	C



Management of Complex AAA – elective endovascular repair

Recommendation 117 (New)	Class	Level
For patients undergoing endovascular repair of complex abdominal aortic aneurysms, consideration should be given to limiting the aortic coverage to reduce the risk of spinal cord ischaemia, however without compromising the proximal sealing zone.	IIa	C



Management of Complex AAA – urgent repair

Recommendation 129 (Changed)	Class	Level
For patients with a ruptured complex abdominal aortic aneurysm (or who are deemed urgent for any other reason), open surgical repair or endovascular repair (with off the shelf branched stent graft, physician modified endograft, in situ fenestrations, or parallel grafts) should be considered based on patient status, anatomy, and patient preferences.	IIa	C

Inflammatory AAA

Recommendation 145 (NEW)	Class	Level
When measuring the diameter of inflammatory abdominal aortic aneurysms to determine the indication for repair, the peri-aortic inflammation or wall oedema should not be included.	III	C



Shared Decision Making

Recommendation 159 (New)	Class	Level
Shared decision making should be facilitated during conversations around abdominal aortic aneurysm screening, surveillance and the management of large asymptomatic abdominal aortic aneurysms being considered for repair.	I	B

