Appendix A. Table of Evidence

Recommendation 13 (unchanged)				**Class**	**Level of evidence**
Pre-operative assessment of cardiac, pulmonary, and renal function is recommended before elective open or complex endovascular repair involving the descending thoracic aorta to allow for informed decision making and pre-operative optimisation.				I	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Girardi LN J Thorac Cardiovasc Surg 2014	Retrospective single centre study of prospectively gathered data 1997-2012	444 pts undergoing pre-op cardiac catheterisation OSR DTAA or TAAA	31 CABG (6.6%) left main CAD (*n* = 9) triple vessel CAD (*n* = 22) 44 PCI (>70% stenosis single or double vessel disease) 369 CAD-	PCI group: no aneurysm rupture in the interval of eight weeks between PCI and OSR of TAAA CABG group: no aneurysm rupture in the three month interval between CABG and OSR of TAAA No MIs, no stent or graft thrombosis, no return to OR for post-operative haemorrhage No significant differences between the groups with respect to mortality, MI or SCI.	
Coselli JS J Thorac Cardiovasc Surg 2018	Retrospective single centre (1991-2006) - and prospectively (2006-2016) gathered data - propensity matching	1 003 pts (622 after propensity matching) OSR TAAA type II	399 CKD+ (GFR< 60 ml/min/1.73 m2) 604 CKD-	Pts with CKD: Higher rate of adverse events (27 *vs.* 18.6% - *p*=.01), renal failure requiring dialysis (14.1 *vs.* 8.7% *p*=.03), cardiac complications (42.8 *vs.* 33.4% *p*=.009), life altering complications (18.1 *vs.* 9.6% *p*=.005) Multivariable modelling: CKD predicts adverse events (RRR	

				1.61; *p*=.01) and renal failure requiring haemodialysis (RRR 1.86; *p*=.02) and pts with CKD had lower 10 yr. age adjusted survival (23.0 vs 48.5% *p*< .001)
Girardi LN J Thorac Cardiovasc Surg 2017	Retrospective single centre of prospectively gathered data 1997-2015	711 pts OSR DTA/TAAA	159 FEV1 <=50% 552 FEV1 >50%	After propensity score matching: Operative mortality 11.4% *vs.* 6.0%; *p*=.10, in hospital MAE 33.1% *vs*. 19.5% *p*=.008
Orozco-Sevilla V J Thorac Cardiovasc Surg 2024	Prospective single centre study	2 368 pts OSR elective TAAA	1 723 COPD+ 633 no COPD-	Pulmonary complications: 38.4% COPD+ *vs.* 30% COPD—; *p*<.001 Operative mortality: 7.9 *vs.* 3.8%; *p*<.001 Adverse events: 14.9% *vs*. 9.8%; *p*= .001
Coselli JS	Retrospective single centre (1986-2006) - and	3 309 pts	914 TAAA I 1 066 TAAA II	Peri-operative mortality: TAAA extent: 9.5% II; 8.8% III; I 5.9%; 5.4% IV

J Thorac Cardiovasc Surg 2016	prospectively (2006-2014) gathered data	OSR TAAA (2/3 degenerative and 1/3 dissection)	660 TAAA III 669 TAAA IV	AE (operative death, permanent stroke, paraplegia, paraparesis, renal failure requiring haemodialysis): II 19% - IV 10%, *p*<.001 Paraplegia: II 4.7%, III 4.4%, I 1.3%, IV 0.9% Survival with life altering complication (permanent paraplegia, paraparesis, renal failure or stroke): I 4.4%, II 9.5%, III 6.3%, IV 4.5% *p*<.001
Brown CR J Thorac Cardiovasc Surg 2020	Retrospective study of Medicare database (2000-2014)	24 772 pts TEVAR for DTAA	2 957 CKD+ (747 with ESRD/HD) 23 374 CKD-	30d survival: no CKD 92%, CKD I/II 94%; CKD III 90%, CKD IV 87%, ESRD/HD 83% One yr. survival: no CKD 78%; CKD I/II 77%; CKD III 67%; CKD IV 58%; ESRD/HD 48% Five yr. survival: no CKD 48%; CKD I/II 42%; CKD III 35%; CKD IV 20%; ESRD/HD 15% Multivariable Cox regression: CKD III (HR 1.45; CI 1.36-1.45; *p*<.001); CKD IV (HR 1.97; CI 1.77-2.18; *p*<.001); ESRD/HD (HR 2.46; CI 2.20-2.75; *p*<.001) associated with decreased survival

CI = confidence interval; LSA = left subclavian artery; DTA = Descending thoracic aorta; RR = risk ratio; TEVAR = thoracic endovascular aortic repair; OSR = Open Surgical Repair; CKD = Chronic Kidney Disease; TAAA = thoraco-abdominal aortic aneurysm; GFR = glomerular filtration rate; GOLD = Global initiative for chronic Obstructive Lung Disease; ESRD = end stage renal disease; CABG = Coronary Artery Bypass Grafting; MAE = major adverse; HD = haemodialysis

Recommendation 15 (new)				**Class**	**Level of evidence**
Multidisciplinary assessment of patient frailty should be considered in candidates for elective descending thoracic aortic repair.				IIa	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Flanagan CP J Vasc Surg 2021	Retrospective, single centre of prospectively collected data 2010 – 2019	256 pts FBEVAR	10 totally dependent * 69 partially dependent ** 176 independent	Two year mortality: 40% (totally dependent) *vs.* 33% (partially dependent) *vs.* 11% (independent)	
Kärkkäinen JM J Vasc Surg 2021	Retrospective single centre (2007-2013) and prospectively (2013 – 2019) collected data	504 pts Elective FBEVAR for TAAA or PRAAA	33 high risk (ASA IV + LPMA $\leq$350 cm2HU) 181 intermediate risk (ASA III + LPMA $\leq$350 cm^2HU) 290 low risk (ASA II + LPMA >350 cm^2HU)	90 day mortality: 1.7% low, 7.2% medium, 30.3% high risk patient groups; *p*<.001 Post-operative MAE (30 d or in hospital death, AKI, MI, resp failure, paraplegia, stroke, bowel ischaemia): 16.2% *vs.* 23.8% *vs.* 33.3%; *p*=.02 Three year survival rate: 80% *vs.* 70% *vs.* 35%; *p*<.001	
Paajanen P J Vasc Surg 2022	Retrospective single centre study of prospectively collected data 2007 - 2019	592 pts FBEVAR	83 High risk (mFI-11>0.5) 199 Medium risk (mFI11 0.3-0.5) 310 Low risk (mFI11<0.3)	90 day mortality: 13% high risk vs 4% medium risk vs 3% low risk group; *p*<.01 MAE: 27% *vs.* 18% *vs.* 19%; *p*=.23 Estimated survival at one year: 91% *vs.* 88% *vs.* 78%; P<.001	

* Totally dependent (any impairment in activities of daily living or residing in a skilled nursing facility)

** Partially dependent (any impairment in instrumental activities of daily living)

ASA = American Society of Anaesthesiologists physical status; LPMA = lean psoas muscle area; mFI11 = 11 item modified frailty index; FB EVAR = fenestrated and branched EVAR (endovascular aortic

repair); MAE = major adverse events

Recommendation 23 (changed)				**Class**	**Level of evidence**
Protocolised strategies* for the prevention, early detection, and management of spinal cord ischaemia are recommended for patients undergoing descending thoracic and thoraco-abdominal aortic repair.				I	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Dijkstra ML Eur J Vasc Endovasc Surg, 2018	Systematic review of cohort studies	7 168 pts from 43 studies Endovascular TAAA repair		Use of selective spinal fluid drainage in high risk patients seems justified. Peri-operative hypotension should be avoided and treated where possible.	
Aucoin VJ J Vasc Surg, 2021	Retrospective study of VQI database (2014-2019)	3 406 pts Elective TEVAR/cEVAR	Prophylactic *vs.* therapeutic CSF drainage	Overall SCI rate: 2.3% SCI outcome: permanent paraplegia at discharge was 79% in therapeutic group *vs.* 54% in prophylactic group (*p*=.04) and survival was 50% *vs.* 71% (*p*=.05).	
Tenorio ER Ann Surg, 2022	Prospective single centre study (213-2018)	232 pts Endovascular TAAA repair		A standardized strategy to prevent SCI, including maintaining perfusion pressure and haemoglobin levels, CSF drainage, neuromonitoring, and minimising coverage, was associated with low incidence of the spinal cord ischaemia, with 1% permanent paraplegia.	
Sickels AD J Vasc Surg, 2025	Retrospective study 2015-2022	402 pts FBFEVAR	Pre- and post-SCI prevention protocol	SCI: 15.9% in pre-protocol patients *vs.* 3.0% in post-protocol patients (*p*<.001). In high risk patients, the pre- and post-protocol cohort SCI incidence was 23.2% *vs.* 5.0%, respectively (*p*<.001).	

* Staging the procedure, maintaining a high BP and haemoglobin ≥10 g/dL, preservation or restoration of collaterals, cerebrospinal fluid drainage (CSFD), and neuromonitoring, as appropriate.

Recommendation 24 (new)				**Class**	**Level of evidence**
Staged repair should be considered for patients undergoing extensive thoracic and thoraco-abdominal endovascular aortic repair.				IIa	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Kasprzak PM Eur J Vasc Endovasc Surg, 2014	Retrospective trial	83 pts Endovascular TAAA repair	40 temporary aneurysm sac perfusion 43 non-perfusion	Severe SCI or paraplegia in 13% Lower SCI rate in the temporary aneurysm sac perfusion group vs the non-perfusion group (5% *vs.* 21%; *p*=.03), especially in Crawford I-III aneurysms (3% *vs*. 29%; *p*=.01).	
Juszczak MT Eur J Vasc Endovasc Surg 2019	Retrospective single centre study (2008-2017)	187 pts Elective FBEVAR for TAAA or JRAAA with > 40 mm supracoeliac sealing zone	167 staged repair without prophylactic CSF drain 20 non-staged repair with prophylactic CSF drain	SCI: 20% in non-staged with prophylactic CSF drain *vs.* 1.2% in staged with no prophylactic CSF drain; *p*=.001	
Dias-Neto M J Vasc Surg 2023	Retrospective multicentre study (2006-2021)	1 947 pts from 24 centres FBEVAR for extent I-III TAAA	1 008 multistage repair 939 single stage repair	Permanent paraplegia: 4.3% in multistage *vs.* 10% in single-stage repairs (*p*<.001). After adjustment with a propensity score, multistage approach (*vs.* single stage) was associated with lower 30 day or in hospital death and or permanent paraplegia (odds ratio, 0.466; *p*=.006) and higher patient survival at one year (86.9% *vs.* 79.6%) and three years (72.7% *vs.* 64.2%; HR 0.714; *p*=.029)	

Recommendation 25 (changed)				**Class**	**Level of evidence**
Prophylactic cerebrospinal fluid drainage is recommended for patients undergoing open thoracic or thoraco-abdominal aortic repair.				I	A
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Coselli JS, J Vasc Surg 2002	RCT	145 pts OSR extent I-II TAAA	76 with prophylactic CSF drain 69 without prophylactic CSF drain	prophylactic CSF drainage reduced permanent SCI from 13% to 3%, an 80% relative risk reduction	
Khan SN Cochrane Database Syst Rev, 2012	Cochrane review and meta-analysis of RCTs	287 pts from three RCTs OSR extent I-II TAAA	Prophylactic CSF drain *vs.* no prophylactic CSF drain	Meta-analysis showed an OR for SCI with prophylactic CSF drain of 0.48 (95% CI 0.25 to 0.92).	

Recommendation 34 (new)				**Class**	**Level of evidence**
Percutaneous access should be considered the preferred method for common femoral artery access in patients undergoing thoracic endovascular aortic repair.				IIa	A
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Antoniou GA Eur J Vasc Endovasc Surg, 2021	Systematic review and meta-analysis of RCTs	368 pts (530 access sites) from four RCTs EVAR	percutaneous *vs.* surgical access of the common femoral artery	Seroma or lymphorrhoea: significantly less frequent after percutaneous EVAR compared with cutdown EVAR (0% *vs.* 3%, OR 0.18, 95% CI 0.04-0.83). Procedure time: significantly shorter for percutaneous EVAR compared with cutdown EVAR (MD -11.53 minutes; 95% CI - 15.71--7.34). No significant difference in access site complications, infection, post-operative bleeding or haematoma, access related arterial injury, femoral artery occlusion, pseudoaneurysm, peri-operative death, or hospital length of stay.	
Vierhout BP Eur J Vasc Endovasc Surg, 2017	Systematic review and meta-analysis of four RCTs and 13 observational studies	7 889 access sites EVAR, TEVAR, or TAVR	2 939 percutaneous access 4 950 surgical access	Percutaneous access associated with fewer post-operative seromas (OR 0.15, 95% CI 0.06-0.35), less wound dehiscence (OR 0.14, 95% CI 0.03-0.78), and fewer surgical site infections (OR 0.38, 95% CI 0.23-0.63) but more post-operative pseudoaneurysms (OR 3.83, 95% CI 1.55-9.44).	

CI = confidence interval; EVAR = endovascular aneurysm repair; MD = mean difference; NR = not reported; OR = odds ratio; RCT = randomised controlled trial; TAVR = transcatheter aortic valve replacement; TEVAR = thoracic endovascular aortic repair

Recommendation 35 (new)				**Class**	**Level of evidence**
Ultrasound guidance is recommended for percutaneous common femoral artery access in thoracic endovascular aortic repair.				I	A
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Li J Front Cardiovasc Med, 2023	Systematic review and meta-analysis of nine RCTs	2 361 pts	1 619 ultrasound guidance 1 644 non-ultrasound guidance	Success rates at first attempt: 80% with ultrasound guidance *vs.* 54% without (OR 3.14, 95% CI 2.30-4.28). Rates of haematoma: 1.4% *vs.* 3.8% (OR 0.41, 95% CI 0.17-1.00).	
d'Entremont MA, EuroIntervention, 2024	Systematic review and individual participant data meta-analysis of four RCTs	2 441 pts Coronary interventions	1 208 with ultrasound guidance 1 233 without ultrasound guidance	Major vascular complications or major bleeding less common with ultrasound guided femoral puncture (OR 0.61, 95% CI 0.39-0.94).	
Meijers TA, EuroIntervention, 2024	RCT	544 pts Large bore femoral access for complex coronary interventions	274 with ultrasound guidance 270 with fluoroscopy guidance	First pass puncture success rate was 92% for ultrasound guided access *vs.* 85% for fluoroscopy guided access (p=.02). No difference in clinically relevant bleeding or vascular access site complications (p=0.32).	

Recommendation 37 (new)				**Class**	**Level of evidence**
Routine thoracic endovascular aortic repair is not indicated for uncomplicated acute type B aortic dissections outside clinical trials.				IIIa	B
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Brunkwall J Eur J Vasc Endovasc Surg, 2014	Industry sponsored RCT	61 pts Uncomplicated acute TBAD	30 TEVAR + BMT 31 BMT alone	No difference in dissection related mortality rate at one year	
Nienaber CA Circulation, 2009	Industry sponsored RCT	140 pts Uncomplicated sub-acute TBAD	72 TEVAR + BMT 68 BMT alone	No difference in two year survival rate: 88.9% BMT + TEVAR *vs.* 95.6% BMT alone; *p*=.15	
Nienaber CA Circ Cardiovasc Interv, 2013	See above	Five year outcomes of the same study	See above	Non-significant 8.2% absolute reduction in five year all cause mortality for the BMT + TEVAR cohort A landmark analysis of years two to five suggested that TEVAR significantly reduced aortic related death but did not improve overall survival compared with medical therapy alone	

Recommendation 40 (changed)				**Class**	**Level of evidence**
Patients with complicated* acute type B aortic dissection are recommended for immediate thoracic endovascular aortic repair to cover the primary entry tear.				I	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Fattori R JACC Cardiovasc Interv, 2008	Prospective registry (IRAD)	571 pts Acute TBAD	390 Medical treatment alone 59 OSR 66 TEVAR	After propensity and multivariable adjustment, OSR was associated with increased risk of in hospital death compared with endovascular treatment (33.9% *vs.* 10.6%, OR 3.41; *p*=.05)	
Steuer J Eur J Vasc Endovasc Surg, 2011	Retrospective single centre (1999-2009)	60 pts Acute complicated TBAD	-	30 day outcome: two (3%) deaths, one (2%) paraplegia and three (5%) strokes were observed. Five year outcome: 87% survival and 65% freedom from re-intervention	
Fattori R J Am Coll Cardiol, 2013	Prospective registry (IRAD)	1 129 pts Acute TBAD	853 Medical treatment alone 276 TEVAR (61.7% complicated)	In hospital death: 10.9% *vs.* 8.7%, *p*=0.273) One-year mortality: 8.1% *vs.* 9.8%, *p*=.604. Five year Kaplan-Meier estimated survival: 29.0% *vs.* 15.5%, *p*=.018	

Recommendation 47 (unchanged)				**Class**	**Level of evidence**
Patients with uncomplicated* penetrating aortic ulcer or intramural haematoma of the descending thoracic aorta are recommended for conservative management, including best medical therapy and surveillance with serial cross sectional imaging.				I	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Nathan DP J Vasc Surg, 2012	Retrospective single Centre (2003-2009)	315 pts PAU	265 Conservative 30 TEVAR 10 EVAR 10 OSR	Primary indications for early intervention: Saccular Aneurysm (*n*=26), Rupture (*n*=16), Persistent symptoms (*n*=8) Symptomatic PAU (*vs.* asymptomatic PAU) more likely to progress (42.9% *vs.* 16.7% *p*=.029), and require repair (36.2% *vs.* 7.8%; *p*<.001) Close surveillance advised.	
Salim S J Vasc Surg, 2020	Retrospective single centre (2007-2019)	43 pts PAU	29 Conservative 13 Endovascular 1 OSR	4/29 (13.8%) conservatively managed eventually required surgical treatment after mean 50 months The overall long term mortality rate was 30% after mean follow up 48 months, with no significant difference between the conservatively and surgically managed groups (*p*=.98). No aortic related deaths were documented during follow up in those managed conservatively.	

Evangelista A Eur J Cardiothorac Surg, 2015	Review	925 pts Type B IMH	731 Conservative 108 OSR 86 Endovascular	30 day mortality: 3.9% Three year aortic event related mortality rate: 5.4% *vs.* 23.2% *vs.* 7.1%. Uncomplicated type B IMH: low mortality rate in acute phase and can be managed medically. Follow up imaging recommended at seven days, three and six months and annually thereafter Complicated IMH: endovascular treatment is preferred

Recommendation 50 (changed)				**Class**	**Level of evidence**
Beta blockers, angiotensin converting enzyme inhibitors, angiotensin receptor blockers, and or calcium channel blockers are recommended for long term antihypertensive medical treatment in patients with chronic type B aortic dissection.				I	B
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Genoni M Eur J Cardiothorac Surg, 2001	Single centre retrospective Study	71 pts Medical treatment of TBAD	51 beta blockers 20 other antihypertensive drugs	20/71 (28%) required surgical treatment during follow up: 10/51 (20%) in beta blocker group *vs.* 9/20 (45%) in other antihypertensive group (*p*=.001) Long term treatment with β blockers reduces progression of aortic dilatation, incidence of subsequent hospital admissions, incidence of late dissection related aortic procedures, and cost of treatment.	
Suzuki T Am J Cardiol, 2012	Multicentre prospective registry (IRAD)	1 301 pts Long term follow up of patients with TAAD and TBAD	Different medical treatment regimes	Beta blockers associated with improved survival in those with TAAD undergoing surgery (OR 0.47, *p*=.02) Calcium channel blockers associated with improved survival in patients with TBAD (OR 0.55, *p*=.01).	
Jonker FH Ann Thorac Surg, 2012	Multi-centre prospective registry (IRAD)	191 pts Long term follow up after TBAD	Different medical treatment regimens	Calcium channel blockers associated with decreased aortic expansion during follow up (regression coefficient, -3.8; 95% CI, 6.2 to -1.3)	

Chen SW JAMA Netw Open, 2021	Population based retrospective cohort study (National Health Insurance Research Database in Taiwan)	6 978 pts Long term follow up of patients with aortic dissection	3 492 β blocker 1 729 ACEI or ARB 1 757 other antihypertension drug (control group)	All cause mortality rate lower in the ACEI/ARB group (HR, 0.79; 95%CI, 0.71-0.89) and the beta blocker group (HR, 0.82; 95%CI, 0.73-0.91) *vs.* control group. Hospital readmission lower in the ACEI/ARB group (HR, 0.92; 95%CI, 0.84-0.997) and beta blocker group (HR, 0.87; 95%CI, 0.81-0.94) *vs.* control group.
Smedberg C Open Heart, 2022	Population based prospective registry	3 046 pts Long term follow up of patients with TAAD and TBAD	Different medical treatment regimes	Among surgically managed patients, beta blockers (HR 0.58, *p*=.038) and ARBs (HR 0.58, *p*=.012) associated with higher long term survival. In medically managed patients, calcium channel blockers (HR 0.70, *p*=.001)) and ACE inhibitors (HR 0.80, *p*p= 0.014) associated with higher long term survival.

Recommendation 51 (new)				**Class**	**Level of evidence**
Patients with type B aortic dissection should be considered for long term statin therapy.				IIa	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Cheng J J Endovasc Ther, 2024	Retrospective single centre study	645 pts Follow up after TEVAR for acute TBAD	330 statins 315 non-statins	Statins associated with decreased risk of all cause death [HR 0.47, *p*=.040] and aorta related adverse events [HR 0.45, *p*=.012] during long term follow up after TEVAR	
Smedberg C Open Heart, 2022	Population based prospective registry	3 046 pts Long term follow up of patients with TAAD and TBAD	Different medical treatment regimes	In medically managed patients, statins associated with higher long term survival (HR 0.65, *p*=.013) No association between statins and long term survival in surgically managed patients (HR 0.82, *p*=.230)	

Recommendation 54 (changed)				**Class**	**Level of evidence**
Thoracic endovascular aortic repair should be considered as the primary treatment option for patients with chronic type B aortic dissection and aneurysm formation confined to the thoracic aorta.				IIa	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Conrad MF Ann Surg, 2010	Registry study (Medicare)	2 701 pts Chronic post-dissection DTA repair	TEVAR vs OSR	Peri-operative mortality: 9% after TEVAR *vs.* 21% after OSR ($p<.001$)	

Recommendation 56 (new)				**Class**	**Level of evidence**
Endovascular repair with fenestrated and branched technologies should be considered first line therapy in patients with chronic type B aortic dissection and aneurysm formation involving the thoraco-abdominal aorta.				IIa	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Oikonomou K Eur J Vasc Endovasc Surg, 2019	Retrospective two-centres study	71 pts Chronic post-dissection TAAA treated with FBEVAR	-	Short term outcome: technical success 95.8%, in hospital mortality 5.6%, SCI 4.2%. Two year outcome: survival 80.7%, freedom from re-intervention 63.0%, complete false lumen thrombosis 85.4%, target vessel occlusion 3.1%, aneurysm sac diameter stable or decreased in 100%, no ruptures	
Tenorio ER J Vasc Surg, 2020	Retrospective multicentre study	50 pts Chronic post-dissection TAAA treated with FBEVAR	-	Short term outcome: technical success 100%, 30 day mortality 2%, SCI 6%. Two year outcome: survival 84%, freedom from re-intervention 58%, complete false lumen thrombosis 72%	
Abdelhalim MA J Vasc Surg, 2023	Retrospective study (16 centres)	246 pts Chronic post-dissection extent I-III TAAA treated with FBEVAR	-	Short term outcome: technical success 96%, 30 day mortality rate 3%, permanent paraplegia 2%. Five year outcome: survival 65%, freedom from aortic related death 93%, freedom from re-intervention 44%.	
Conrad MF Ann Surg, 2010	Registry study (Medicare)	2 701 pts Chronic post-dissection DTA repair	TEVAR *vs.* OSR	Peri-operative mortality rate: 9% after TEVAR *vs.* 21% after OSR (p<.001)	

Recommendation 58 (changed)				**Class**	**Level of evidence**
Open surgical repair may be considered in selected patients* at low surgical risk with chronic type B aortic dissection and thoraco-abdominal aorta aneurysm formation.				IIb	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Tanaka A J Thorac Cardiovasc Surg, 2021	Retrospective Study	427 pts Chronic post-dissection DTAA or TAAA treated with OSR	-	30 day mortality 8.4%, paraplegia and paraparesis 5.2%. At 10 years: freedom from any aortic procedures 85%, aortic procedure free survival 45%. Patients at low surgical risk (defined as absence of low eGFR, redo aortic surgery, and COPD) showed better peri-operative outcomes	
Alfonsi J Eur J Cardiothorac Surg, 2018	Retrospective single centre Study	217 pts Chronic post-dissection TAAA treated with OSR	-	Early mortality 5.9%, SCI 5.5%. Ten year survival 71.4%, freedom from death and re-operation 68.2%	
Preventza O Eur J Cardiothorac Surg, 2018	Retrospective single centre study	466 pts Chronic post-dissection extent I and III TAAA treated with OSR	-	Peri-operative mortality 6%, persistent spinal cord deficit 2.6% Six year survival 74.4%.	
Gombert A Eur J Vasc Endovasc Surg, 2022	Retrospective single centre study	255 pts TAAA (58% post-dissection) treated with OSR	-	In hospital mortality rate 16%, temporary renal replacement therapy 28%, SCI 6%.	

Recommendation 60 (new)				**Class**	**Level of evidence**
Patients with a small descending thoracic or thoraco-abdominal aortic aneurysm who are deemed fit for repair are recommended for surveillance with serial* cross sectional imaging to monitor growth.				I	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Sharples L Eur Heart J, 2022	Prospective study of UK National Health Service (NHS) (2014-2018)	886 pts New or existing arch or DTAA of ≥4 cm diameter, followed up until death, intervention, withdrawal, or July 2019.	Serial imaging	Significant association between aneurysm size and all cause deaths (HR 1.9 per cm) and aneurysm related deaths (HR 2.2 per cm) The predicted one year aneurysm related event probabilities for aneurysms of 6 cm, 7 cm, and 8 cm were 3.5%, 7.1% and 13.8% respectively Each 1 cm increase in the maximum diameter within a patient more than doubled the overall risk of death (HR 2.0) and aneurysm related death (HR 2.4)	

Recommendation 61 (unchanged)				**Class**	**Level of evidence**
Patients with descending thoracic or thoraco-abdominal aortic aneurysms and an aortic diameter ≥ 60 mm should be considered for repair, taking into account fitness, aneurysm anatomy, and patient preferences.				IIa	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Sharples L Eur Heart J, 2022	Prospective study of UK National Health Service (NHS) (2014-2018)	886 pts Arch or DTAA of ≥4 cm diameter, followed up until death, intervention, withdrawal, or July 2019.	Serial imaging	Significant association between aneurysm size and all cause deaths (HR 1.9 per cm) and aneurysm related deaths (HR 2.2 per cm) The predicted one year aneurysm related event probabilities for aneurysms of 6 cm, 7 cm, and 8 cm were 3.5%, 7.1% and 13.8% respectively	
Zafar MA J Thorac Cardiovasc Surg, 2021	Retrospective single centre study	907 pts DTAA and TAAA (>3 cm)	Serial imaging	Median diameter of DTAA before dissection, operation, aortic death, and rupture was 4.1 cm, 5.8 cm, 6.0 cm, and 6.6 cm, respectively. complications (rupture, dissection, and death) increase dramatically at two hinge points, 60 mm (p=.014) and 65 mm (p<.001).	
Davies RR Ann Thorac Surg, 2002	Prospective	721 pts DTAA	Serial imaging	Aortic size was a very strong predictor of rupture, dissection, and death: For DTAA > 6 cm in diameter, annual rupture rate was 3.7%, rupture or dissection 6.9% per year, death 11.8%, and death,	

				rupture, or dissection 15.6%. For DTAA > 6.0 cm, OR for rupture was increased 27 fold (*p*=.0023).
Kim JB Circulation, 2015	Retrospective single centre study	257 pts DTAA or TAAA	Serial imaging	Estimated risks of definite aortic events (dissection, rupture, death): 5.5% at aortic diameters 50 mm, 7.2% at 55 mm, 9.3% at 60 mm, and 15.4% at 70 mm

Recommendation 62 (unchanged)				**Class**	**Level of evidence**
A lower aortic diameter threshold (≥ 55 mm) for repair may be considered in selected patients with descending thoracic or thoraco-abdominal aortic aneurysms.				IIb	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Zafar MA J Thorac Cardiovasc Surg, 2021	Retrospective single centre study	907 pts DTAA and TAAA (>3 cm)	Serial imaging	Complications showed a six fold increase at an aortic height index of 4.2 or greater compared with an aortic height index of 3.0 to 3.5 (p<.05).	
Chen JF Ann Thorac Surg, 2021	Retrospective single centre study	907 pts DTAA and TAAA (>3 cm)	Serial imaging	Mean growth rate 0.17 cm per year in men and 0.25 cm per year in women (p<.001). Dissection, rupture, or aortic death or the combination of the three occurred at double the rate for women compared with men (5.8% *vs.* 2.3% per year for the combined endpoint). The probability of fatal complications (rupture and death) increased sharply at 5.75 cm in both sexes. Between 4.5 and 5.75 cm, there was another hinge point of higher probability of fatal complications among women.	
Pouncey AL Br J Surg, 2024	Prospective cohort study	886 arch and DTAA referred to NHS hospital in England	Followed from 2014 to 2022	Women had significantly worse survival without intervention (log rank test, p<.001). All cause mortality rate remained greater for women after adjustment for diameter (HR 1.65 (95% CI 1.35-2.02); p<.001), but	

				was attenuated after adjustment for aneurysm size index (HR 1.11 (95% CI 0.89-1.38); *p*=.359). Similar results were found for all follow up, with or without intervention, and findings were consistent for DTAA alone.

Recommendation 64 (changed)				**Class**	**Level of evidence**
Thoracic endovascular aortic repair is recommended as the first line surgical treatment option in patients with descending thoracic aortic aneurysms.				I	B
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Chiu P J Am Coll Cardiol, 2019	Retrospective registry (Medicare) study, with propensity score analysis	3 705 pts Intact DTAA	1 235 OSR *vs.* 2 470 TEVAR	180 day mortality rate: OSR 23.8% (95% CI 21.4%-26.1%) *vs.* TEVAR 10.2% (95% CI 9.0%-11.4%) Peri-operative mortality rate was greater for OSR: high volume centre Odds ratio 1.97 and low volume centre Odds ratio 3.62	
Harky A Ann Vasc Surg, 2019	Meta-analysis	14 580 pts from 13 studies DTAA	10 672 OSR vs 3 908 TEVAR	OSR: younger (mean of 65.1 years *vs*. 70.0 years, *p*=.0009), and more often elective repairs (83.4% *vs.* 81%, *p*=.36). TEVAR: higher rate of chronic renal disease (12.98% *vs.* 5.24%, *p*<.0001), more advanced chronic lung disease (30.96% *vs.* 21.66%, *p*<.0001), and higher rate of ischaemic heart disease (9.13% *vs.* 3.99%, *p*<.0001). After OSR: higher rate of paraplegia (*p*=.007), renal failure (*p*=.01) and cardiac complications (*p*<.0001) was higher in the open repair group. After TEVAR: higher rate of vascular complications (5.29% *vs.* 1.17%, *p*=.002), and operative mortality (4.4% *vs.* 3.2%, *p*=.005), shorter duration of ICU and total hospital stay (4.5 *vs.* 8.5 days, *p*=.002 and 5.7	

				vs. 9.5 days, *p*=.0004). No difference in one and five year mortality rates (22.19%, *vs.* 24.04%, *p*=.59, and 44.26% *vs.* 37.37%, *p*=.49)
Abraha I, Cochrane Database Syst Rev, 2016	Cochrane database systematic review	DTAA	OSR vs TEVAR	No RCTs found. Non-randomised studies suggest TEVAR associated with lower early mortality and complication rates such as paraplegia.

Recommendation 65 (changed)				**Class**	**Level of evidence**
Endovascular repair with fenestrated and branched technologies should be considered as the first line surgical treatment option in patients with thoraco-abdominal aortic aneurysms.				IIa	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Oderich GS Ann Surg, 2021	Prospective Single centre study	297 pts TAAA treated with F/BEVAR	-	30 day mortality 1.5% for Extent IV TAAA and 0.6% for extent I-III TAAA. Paraplegia 2% and new onset dialysis 2%. Five year freedom from aortic related death 98%	
Dias-Neto M Ann Surg, 2023	Retrospective multicentre Study	2 603 pts TAAA treated with FBEVAR	-	30 day mortality 6.5% (5% for elective cases) Paraplegia 4%.	
Jobim F J Cardiovasc Surg (Torino), 2024	Review	6 492 pts TAAA	-	Early mortality rate 4.9%. Spinal cord injury (permanent and temporary) 8% One year survival 89.3%.	
Finnesgard EJ J Vasc Surg, 2025	Retrospective multicentre study	2 377 pts TAAA and complex AAA treated with F/BEVAR	-	Adjusted 30 day survival 99.6% (IQR, 99.3%-99.8%) and major AE occurred in 10%. Freedom from aorta related death after FBEVAR was 98.7% at one year and 96.1% at five years.	

Recommendation 66 (changed)				**Class**	**Level of evidence**
Open surgical repair may be considered in selected patients at low surgical risk* with descending thoracic or thoraco-abdominal aortic aneurysms.				IIb	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Cambiaghi M J Cardiovasc Surg (Torino), 2024	Meta-analysis	13 200 pts from 34 studies TAAA treated with OSR	-	Pooled operative mortality rate 7.9%, SCI rate 8.1%, pulmonary failure 25.2% and permanent dialysis 5.1%	
Rinaldi E J Cardiovasc Surg (Torino), 2025	Retrospective single centre study	1 211 pts TAAA treated with OSR	-	30 day mortality rate 9.7%, respiratory failure 28.6%, renal failure 5.6%, SCI 9.1%	
Zeigler S JTCVS Open, 2025	Retrospective single centre study	2 517 pts TAAA treated with OSR		Operative mortality rate 6.4% and early adverse event 12.8%	

Recommendation 67 (new)				**Class**	**Level of evidence**
If coverage of the coeliac artery is required to achieve an adequate seal during endovascular repair for descending thoracic aortic repair, revascularisation should be considered if collateral flow from the superior mesenteric artery is insufficient, preferably by endovascular techniques.				IIa	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Hanna L Eur J Vasc Endovasc Surg, 2022	Meta-analysis	236 pts from 15 studies TEVAR with CA coverage	-	Pooled visceral ischaemia rate 13%, SCI 5%, 30 day or in hospital mortality rate 4%, endoleak 21%, re-intervention 13%	
King RW Ann Vasc Surg, 2020	Registry study (VQI)	628 pts	44 with CA occlusion 584 without CA occlusion	CA occlusion associated with higher 30 day mortality rate (11% *vs.* 4%, *p*=.039), bowel ischaemia (9% *vs.* 2%, *p*=.026), and composite end point (30 day death, spinal cord ischaemia, and bowel ischaemia) (23% *vs.* 9%, *p*=.008) Multivariable analysis: CA occlusion was predictive of 30 day death (odds ratio [OR] = 3.9, *p*=.04) and the composite endpoint (OR = 3.0, *p*=.03)	
Mezzetto L J Endovasc Ther, 2023	Meta-analysis	178 pts from 13 studies With CA coverage	-	The majority of articles reported the preliminary confirmation of visceral collateral pathway before CA coverage (111 of 178 patients [62%]) Visceral complications 15% (splenic infarction, SMA embolisation, shock liver, cholecystitis, and multiorgan failure), SCI 8%, any	

				endoleak 12%, type Ib endoleak 5%, death 9%

Recommendation 68 (new)				**Class**	**Level of evidence**
In endovascular thoraco-abdominal aortic repair, fenestrations may be considered preferred over branches for the renal arteries when the endograft is adjacent to the aortic wall at the level of the renal arteries.				IIb	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Martin-Gonzalez T Eur J Vasc Endovasc Surg, 2016	Retrospective multicentre study	449 pts TAAA treated with FBEVAR	Fenestration vs branches	Renal occlusion rate significantly higher following BEVAR than FEVAR (9.6% vs. 2.3%; *p*<.01) Two year freedom for renal occlusion 90.4% following BEVAR *vs.* 97.1% FEVAR (*p*<.01).	
Panuccio G Eur J Vasc Endovasc Surg, 2015	Retrospective single centre study	150 pts F/BEVAR treated	Fenestration *vs.* branches	Branches (*vs.* fenestrations) association with secondary intervention (hazard ratio [HR] 3.5, *p*=.02) and overall target vessel instability (HR 2.8, *p*<.01)	
Katsargyris A Eur J Vasc Endovasc Surg, 2023	Retrospective single centre study	636 pts Pararenal AAA and TAAA treated with FBEVAR	Fenestration vs branches	Eight year freedom from TVI 93.2% for fenestrations *vs.* 82.7% for branches (*p*<.001). Renal artery patency statistically significantly lower for those targeted with branches compared with those targeted with fenestrations (*p*=.001). No difference in patency shown for the visceral arteries targeted with fenestrations *vs.* those targeted with branches.	

Recommendation 71 (changed)				**Class**	**Level of evidence**
Distal aortic perfusion is recommended during open surgical repair for thoracic and thoraco-abdominal aortic aneurysms to maintain end organ perfusion and reduce the risk of ischaemic complications.				I	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Kouchoukos NT Ann Thorac Surg, 2019	Retrospective single centre study	285 pts Open TAAA repair with cardiopulmonary bypass and hypothermic circulatory arrest	-	30 day mortality rate 7.4%, paralysis or paraplegia 5.3%, stroke 4.2%, renal failure 6.2%	
Fehrenbacher JW J Thorac Cardiovasc Surg, 2010	Retrospective single centre study	343 Open DTAA or TAAA repair with cardiopulmonary bypass and hypothermic circulatory arrest	-	Hospital mortality rate 5.0%, stroke 4.4%, paraplegia or paraparesis 3.2%, renal failure 3.5%	

Recommendation 72 (new)				**Class**	**Level of evidence**
Renal perfusion using cold crystalloid solutions, such as histidine–tryptophan–ketoglutarate (HTK) solution, should be considered during open surgical repair of thoracic and thoraco-abdominal aortic aneurysms to minimise ischaemia–reperfusion injury.				IIa	B
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Kahlberg A J Thorac Cardiovasc Surg, 2023	RCT	90 TAAA	Custodiol *vs.* Ringer's lactate solution	Post-operative AKI: Custodiol *vs.* Ringer (48.9% *vs.* 75.6%; *p*=.02).	
Tshomba Y J Vasc Surg, 2014	Prospective non-randomized comparative study with propensity score matching	111 TAAA	Custodiol *vs.* Ringer's lactate solution	Freedom from AKI: Custodiol *vs.* Ringer (38.1% *vs.* 9.5%; *p*=.002)	

Recommendation 73 (new)				**Class**	**Level of evidence**
Viscoelastic testing* to assess real time clot formation and stability should be considered during open surgical repair of thoracic and thoraco-abdominal aortic aneurysms to guide haemostatic management.				IIa	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Monaco F Eur J Vasc Endovasc Surg, 2019	Retrospective single centre study, with propensity score matching	547 Open TAAA repair	77 matched ROTEM guided transfusion *vs.* 77 matched conventional coagulation tests	ROTEM associated with fewer red blood cells units (3.5 *vs.* 4.0, *p*=.026), lower volume of fresh frozen plasma (286 *vs.* 2,050, *p*<.001), and fewer pulmonary complications (44% *vs.* 83%; *p*=.01)	

Recommendation 81 (new)				**Class**	**Level of evidence**
Thoracic endovascular aortic repair is recommended as the preferred treatment modality for ruptured descending thoracic aortic aneurysm.				I	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Jonker FH J Vasc Surg, 2010	Meta-analysis	228 pts from 28 studies rDTAA repair	TEVAR *vs.* OSR	30 day mortality rate: 18.9% *vs.* OSR 33.3%, *p*=.02) MI: 3.5% *vs.* 11.1%, *p*=.05) No difference in stroke and paraplegia	
Kilic A J Thorac Cardiovasc Surg, 2014	Retrospective registry (USA Nationwide Inpatient Sample) study	2 788 pts rDTAA repair	TEVAR *vs.* OSR	Operative mortality rate 21.5% *vs.* 36.6%; *p*<.001	
Geisbüsch S Eur J Vasc Endovasc Surg, 2019	Retrospective registry (the research data centres of the German Federal Statistical Office) study	5 848 pts rDTAA repair	TEVAR *vs.* OSR	In hospital death 22.3% *vs.* 42.9%	
Yamaguchi T Eur J Vasc Endovasc Surg, 2019	Retrospective registry (Japanese Registry of all Cardiac and Vascular Diseases Diagnostic Procedure Combination) study	604 pts (propensity score matched) rDTAA repair	TEVAR *vs.* OSR	In hospital death 22.5% *vs.* OSR 29.8% *p*<.001, hospitalisation (days) 22.5 *vs.* OSR 32; *p*<.001, medical costs (Million Yen) 6.47 *vs.* OSR 7.28; *p*<.001, Barthel Index at discharge 81.1 *vs.* OSR 79.9; *p*=.71	

Ultee KHJ J Vasc Surg, 2017	Retrospective registry (National Inpatient Sample database) study	12 399 pts rDTAA	Nonoperative management *n*=7 968 TEVAR *n*=1 622 OSR *n*=2 808	In hospital death: TEVAR 22% *vs.* OS 33%; *p*<.001 OSR associated with two fold higher mortality rate compared with TEVAR (OR 2.0), cardiac complications 31% *vs.* 17% (*p*<.001), paraplegia 6% *vs.* 4% (*p* =.031), respiratory complications 43% *vs.* 33% (*p*<.001), wound dehiscence 4% *vs.* 0.9% (*p*<.001), post-operative infection 4% *vs.* 0.6% (*p*<.001), bleeding complications 18% *vs.* 14% (*p*=.015)

Recommendation 88 (new)				**Class**	**Level of evidence**
Non-operative management, with blood pressure control and follow up imaging to assess lesion stability, is recommended for ESVS grade 1 blunt thoracic aortic injury without concomitant traumatic brain injury.				I	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Soong TK J Vasc Surg, 2019	Meta-analysis of 35 observational studies	2 897 pts BTAI managed nonoperatively	-	Pooled prevalence of all cause in-patient death: 6.8% in SVS grade I, 0% in SVS grade II, 29.2% in SVS grade III, and 87.4% in SVS grade IV.	
Jacob-Brassard J J Vasc Surg, 2019	Meta-analysis of 74 observational studies	8 606 pts BTAI managed nonoperatively	-	SVS grade I/II: in Hospital death 8.8%, aortic related death 0,65%, aortic injury improvement or healing 40%, injury progression was 3.4%	
Yadavalli SD J Vasc Surg, 2023	Retrospective registry (VQI) study	1 311 pts BTAI undergoing TEVAR	-	SVS grade 1 injury treated with TEVAR had a high rate of spinal cord ischaemia (2.8%)	
Golestani S J Am Coll Surg, 2024	Retrospective registry (Aortic Trauma Foundation Registry) study	269 pts BTAI	Non-operative management *vs.* TEVAR	Overall mortality rate 8% *vs.* 18%, *p*=.009. Aortic related death 0.5% *vs.* 4% (*p*=.06). No difference in hospital and ICU length of stay and ventilator days	
De Freitas S Ann Vasc Surg, 2024	Meta-analysis of 13 studies	204 pts SVS grade II BTAI managed nonoperatively	-	All cause death 10.4%, aorta related death 2.9%, and early aortic intervention 3.3%.	

Recommendation 90 (changed)				**Class**	**Level of evidence**
Delayed thoracic endovascular aortic repair (>24 hours) should be considered for ESVS grade 2 blunt traumatic aortic injury without high risk features*.				IIa	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Soong TK J Vasc Surg, 2019	Meta-analysis of 35 observational studies	2 897 pts BTAI managed non-operatively	-	Pooled prevalence of all cause inpatient death: 6.8% in SVS grade I, 0% in SVS grade II, 29.2% in SVS grade III, and 87.4% in SVS grade IV.	
Jacob-Brassard J J Vasc Surg, 2019	Meta-analysis of 74 observational studies	8 606 pts BTAI managed non-operatively	-	SVS grade III and IV: aortic related death 18%	
Fox N J Trauma Nurs, 2015	Meta-analysis of seven observational studies	953 BTAI	Immediate *vs.* delayed treatment	Mortality rate (21% *vs.* 9%, RR 2.07), paraplegia (5.5% *vs.* 0.6%, RR 5.90), stroke (9% *vs.* 7%, RR of 1.36)	
Romjin AC Ann Surg, 2023	Retrospective cohort study (American College of Surgeons Trauma Quality Improvement Program)	1 339 pts BTAI	Early *vs.* delayed TEVAR (propensity score matched)	In hospital mortality rate (16% *vs.* 4.9%, RR: 3.3; *p*=.004), length of ICU stay (7.0 *vs.* 10 days; *p*<.001), acute respiratory distress syndrome (7.6% *vs.* 2.1%, RR: 3.7; *p*=.043)	
Marcaccio CL J Vasc Surg, 2018	Retrospective cohort study of administrative data	507 BTAI	Early *vs.* delayed TEVAR	Mortality rate 11.9% *vs.* 5.4% (odds ratio 2.36; *p*=.042). After adjustment for age, ISS, and admission physiology (adjusted odds ratio, 2.39; *p*=.047).	

Yadavalli SD J Vasc Surg, 2024	Retrospective registry (VQI) study	1 016 BTAI undergoing TEVAR	Elective *vs.* urgent or emergency TEVAR	No association between TEVAR timing and peri-operative death (3.9% *vs.* 6.6%; odds ratio 1.1; *p*=.90) or five year mortality rate (5.8% *vs.* 12%; hazard ratio 0.95; *p*>.9) Elective repair associated with lower post-operative stroke (1.0% *vs.* 2.1%; OR 0.12; *p*=.044), less failure of extubation immediately after surgery (39% *vs.* 65%; OR 0.18; *p*<.001) and post-operative pneumonia (4.9% *vs.* 11%; OR 0.34; *p*=.031)
Starnes BW J Vasc Surg, 2012	Retrospective single centre study	140 pts BTAI	-	Size of the peri-aortic haematoma at the level of the aortic arch significantly correlated with death from BTAI, with an average of 20.3 mm in those that died from their aortic injury *vs.* 7.7 mm in those that did not (*p*<.001). Patients with a 15 mm arch haematoma were significantly more likely to die from their BTAI than those with a smaller haematoma (*p*=.011).

Recommendation 91 (changed)				**Class**	**Level of evidence**
Urgent thoracic endovascular aortic repair (<24 hours) is recommended for ESVS grade 2 blunt traumatic aortic injury presenting with high risk features*.				I	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Soong TK J Vasc Surg 2019	Meta-analysis of 35 observational studies	2 897 pts BTAI managed non-operatively	-	Pooled prevalence of all cause inpatient mortality rate: 6.8% in SVS grade I, 0% in SVS grade II, 29.2% in SVS grade III, and 87.4% in SVS grade IV.	
Jacob-Brassard J J Vasc Surg 2019	Meta-analysis of 74 observational studies	8 606 pts BTAI managed non-operatively	-	SVS grade III and IV: aortic related death 18%	
Fox N J Trauma Nurs 2015	Meta-analysis of 7 observational studies	953 BTAI	Immediate *vs.* delayed treatment	Mortality (21% *vs.* 9%, RR 2.07), paraplegia (5.5% *vs.* 0.6%, RR 5.90), stroke (9% *vs.* 7%, RR of 1.36) Patients at a high risk of aortic rupture; Grade 3 and 4 injuries, clinical or radiographic evidence of pseudocoarctation.	
Romjin AC Ann Surg 2023	Retrospective cohort study (American College of Surgeons Trauma Quality Improvement Program)	1 339 pts BTAI	Early *vs.* delayed TEVAR (propensity score matched)	In hospital mortality (16% *vs.* 4.9%, RR: 3.3; *p*=.004), length of ICU stay (7.0 *vs.* 10 days; *p*<.001), acute respiratory distress syndrome (7.6% *vs.* 2.1%, RR: 3.7; *p*=.043)	
Yadavalli SD J Vasc Surg, 2024	Retrospective registry (VQI) study	1 016 BTAI undergoing TEVAR	Elective *vs.* urgent or emergency TEVAR	No association between TEVAR timing and peri-operative death (3.9% *vs.* 6.6%; odds ratio 1.1; *p*=.90) or five year mortality rate (5.8% *vs.* 12%; hazard ratio 0.95; *p*>.9) Elective repair associated with lower post-operative stroke (1.0% *vs.*	

				2.1%; OR 0.12; *p*=.044), less failure of extubation immediately after surgery (39% *vs.* 65%; OR 0.18; *p*<.001) and post-operative pneumonia (4.9% *vs.* 11%; OR 0.34; *p*=.031)
Starnes BW J Vasc Surg 2012	Retrospective single centre study	140 pts BTAI	-	Size of the peri-aortic haematoma at the level of the aortic arch significantly correlated with death from BTAI, with an average of 2.03 cm in those that died from their aortic injury vs 0.77 cm in those that did not (*p*<.001). Patients with a 15 mm arch haematoma were significantly more likely to die from their BTAI than those with a smaller haematoma (*p*=.011).

Recommendation 92 (unchanged)				**Class**	**Level of evidence**
Immediate thoracic endovascular aortic repair is recommended for ESVS grade 3 blunt thoracic aortic injury.				I	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Soong TK J Vasc Surg 2019	Meta-analysis of 35 observational studies	2 897 pts BTAI managed non-operatively	-	Pooled prevalence of all cause in-patient death: 6.8% in SVS grade I, 0% in SVS grade II, 29.2% in SVS grade III, and 87.4% in SVS grade IV.	
Jacob-Brassard J J Vasc Surg 2019	Meta-analysis of 74 observational studies	8 606 pts BTAI managed non-operatively	-	SVS grade III and IV: aortic related death 18%	
Fox N J Trauma Nurs 2015	Meta-analysis of 7 observational studies	953 BTAI	Immediate *vs.* delayed treatment	Death (21% *vs.* 9%, RR 2.07), paraplegia (5.5% *vs.* 0.6%, RR 5.90), stroke (9% *vs.* 7%, RR of 1.36) Patient at a high risk of aortic rupture; Grade 3 and 4 injuries, clinical or radiographic evidence of pseudocoarctation.	

Recommendation 93 (unchanged)				**Class**	**Level of evidence**
Thoracic endovascular aortic repair is recommended as the first line treatment for blunt thoracic aortic injury.				I	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
van der Zee CP J Cardiovasc Surg (Torino) 2019	Meta-analysis	1 882 pts from 74 studies BTAI treated with TEVAR	-	Primary technical success 98.4%, 30 day or in hospital death 7.5% (which correlated with trauma severity as assessed by the Injury Severity Score), endograft related early death 0.8%, paraplegia 0.4%, stroke 1.5%. After a mean follow up of 3.0 years, major stent graft related complications, including significant endoleak, endograft collapse, or graft infection requiring conversion to OSR with explantation, occurred in 6.9% of patients, with a 1% procedure related death	
Demetriades D J Trauma 2008	Comparison between two prospective multicentre studies (AAST1 and AAST2)	467 pts BTAI treated with TEVAR or OSR	AAST1 with 100% OSR *vs.* AAST1 with 35% OSR and 65% TEVAR	Overall mortality rate decreased significantly from 22.0% to 13.0% (p=.02). Incidence of procedure related paraplegia decreased from 8.7% to 1.6% (p=.001).	
Tang GL J Vasc Surg 2008	Meta-analysis	699 pts from 33 retrospective studies BTAI treated with TEVAR or OSR	TEVAR *vs.* OSR	Mortality rate (7.6% *vs.* 15.2%, p=.0076), paraplegia (0% *vs.* 5.6%, p<.0001) and stroke (0.85% *vs.* 5.3%, p=.0028).	

Gennai S J Vasc Surg 2023	Meta-analysis	389 pts BTAI treated with TEVAR surviving 30 days	-	Late re-intervention was 2.1% with 0.1% occurring after five years: bird beak 38.7%, left arm claudication 3.1%, in-stent thrombosis 1.9%, endoleak 0.5%. Infolding, occlusion, and migration were reported in 2 of 389, 1 of 389, and 0 of 389 patients, respectively. Overall late survival was 95.6% and only one patient accounted for aortic related death.
Takagi H J Thorac Cardiovasc Surg 2008	Meta-analysis	565 pts from 17 retrospective studies BTAI treated with TEVAR or OSR	TEVAR *vs.* OSR	TEVAR associated with a 62% reduction in mortality relative to OSR (7.5% *vs.* 24.1%; odds ratio, 0.38; $p<.01$)

Mill V Eur J Vasc Endovasc Surg 2025	Retrospective multicentre study	95 pts BTAI treated with TEVAR	-	30 day mortality rate 16%, 40% of these caused by traumatic brain injury and 33% by aortic related causes. 15 year survival 57%. Aortic re-intervention procedures (re-stenting, coiling, or explantation) were performed in 16%. All complications that required aortic re-intervention were diagnosed within eighteen months of the index procedure, and half presented with symptoms.

Recommendation 95 (new)				**Class**	**Level of evidence**
Moderate stent graft oversizing should be considered in emergency endovascular repair of blunt thoracic aortic injury when pre-operative imaging was obtained during hypotension.				IIa	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Muhs BE J Vasc Surg, 2007	Observational, retrospective single centre case control study	10 pts BTAI treated with TEVAR	Endograft collapse *vs.* no collapse	Distal sealing zone aortic diameter 18.9 mm *vs.* 22.7 mm and minimum aortic diameter within the endograft of 18.6 mm *vs.* 22.4 mm predicted collapse (p<.05)	
Jonker FH J Vasc Surg, 2010	Observational retrospective cohort	43 pts BTAI treated with TEVAR	-	Mean aortic diameter significantly larger at control CT examinations compared with the initial CT examinations while haemodynamically unstable	
García Reyes ME Ann Vasc Surg, 2018	Observational, prospective cohort study	34 pts BTAI treated with TEVAR	-	Patients with complications had significantly higher proximal oversizing (23%) than the group with no complications (17%) (p=.0007).	

Recommendation 118 (new)				**Class**	**Level of evidence**
Long term post-operative surveillance is recommended for patients treated for inflammatory aortitis, given the high risk of delayed complications and disease progression.				I	C
Reference	**Design**	**Population**	**Comparison**	**Relevant findings**	
Espitia O J Am Coll Cardiol 2023	Retrospective multicentre study	217 pts Surgically treated non- infected thoracic aortitis	-	10 year cumulative incidence of vascular complication 82.1% and second vascular procedure 42.6%	