Cervicale arteriële dissecties - een update

Sanne Zinkstok, neuroloog Tergooi MC

Nascholing Nederlandse Neurovasculaire Werkgroep

19 januari 2024

tergooimc

Disclosures

Potentiële belangenverstrengeling	Geen
Voor bijeenkomst mogelijk relevante relaties met bedrijven	Bedrijfsnamen
• Sponsoring of onderzoeksgeld • Honorarium of andere financiële vergoeding • Aandeelhouder • Andere relatie, namelijk	Geen Geen Geen Secretaris Nederlandse Neurovasculaire Werkgroep

Inhoud

- Achtergrond
- Acute behandeling
  - Intraveneuze trombolyse
  - Endovasculaire behandeling
- Secundaire preventie

ESO richtlijn 2021

Guideline

EUROPEAN STROKE JOURNAL

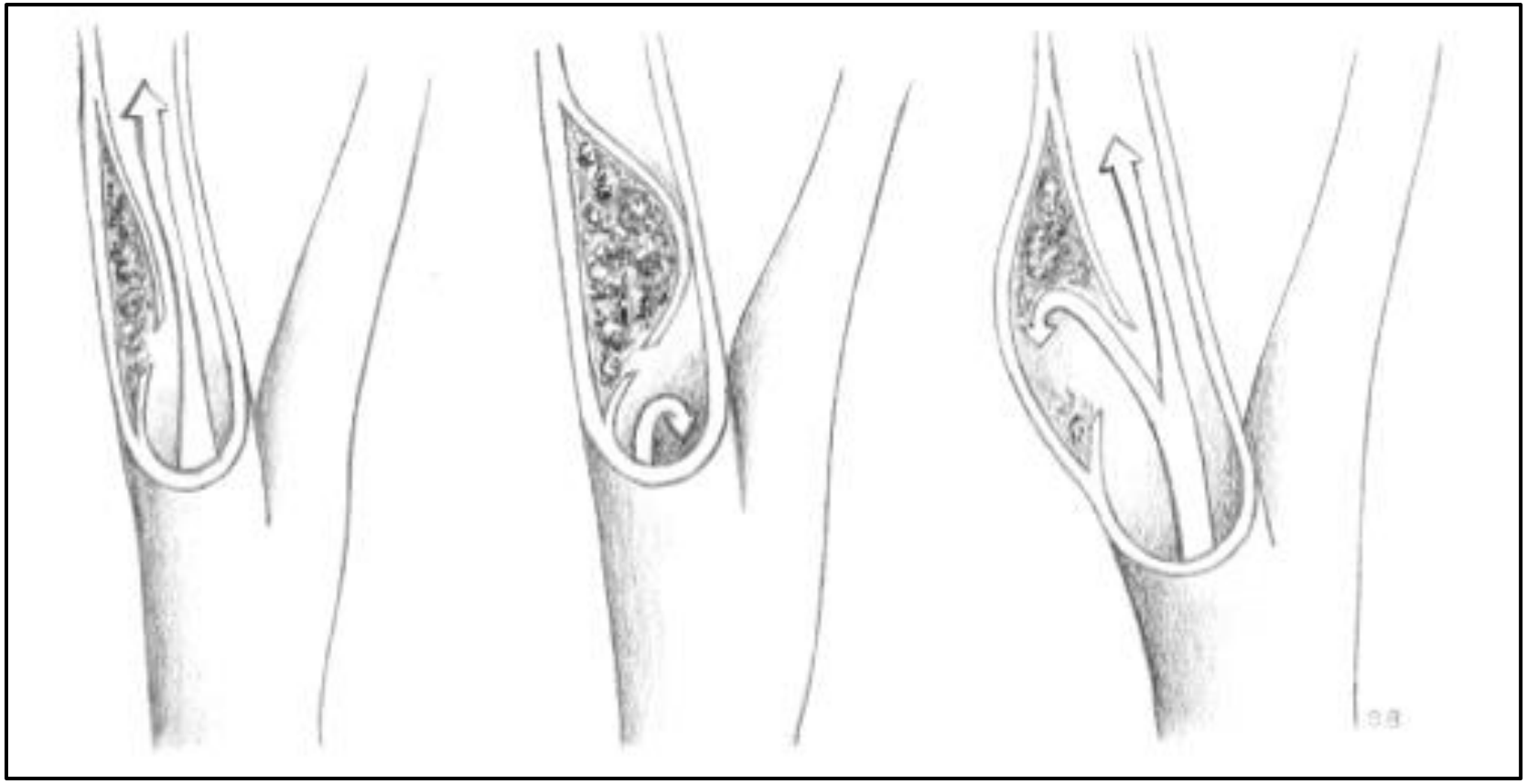
European Stroke Journal
2021, Vol. 6(3) XXXIX–LXXXVIII

DOI: 10.1177/23969873211046475
journals.sagepub.com/home/eso
SAGE

ESO guideline for the management of extracranial and intracranial artery dissection

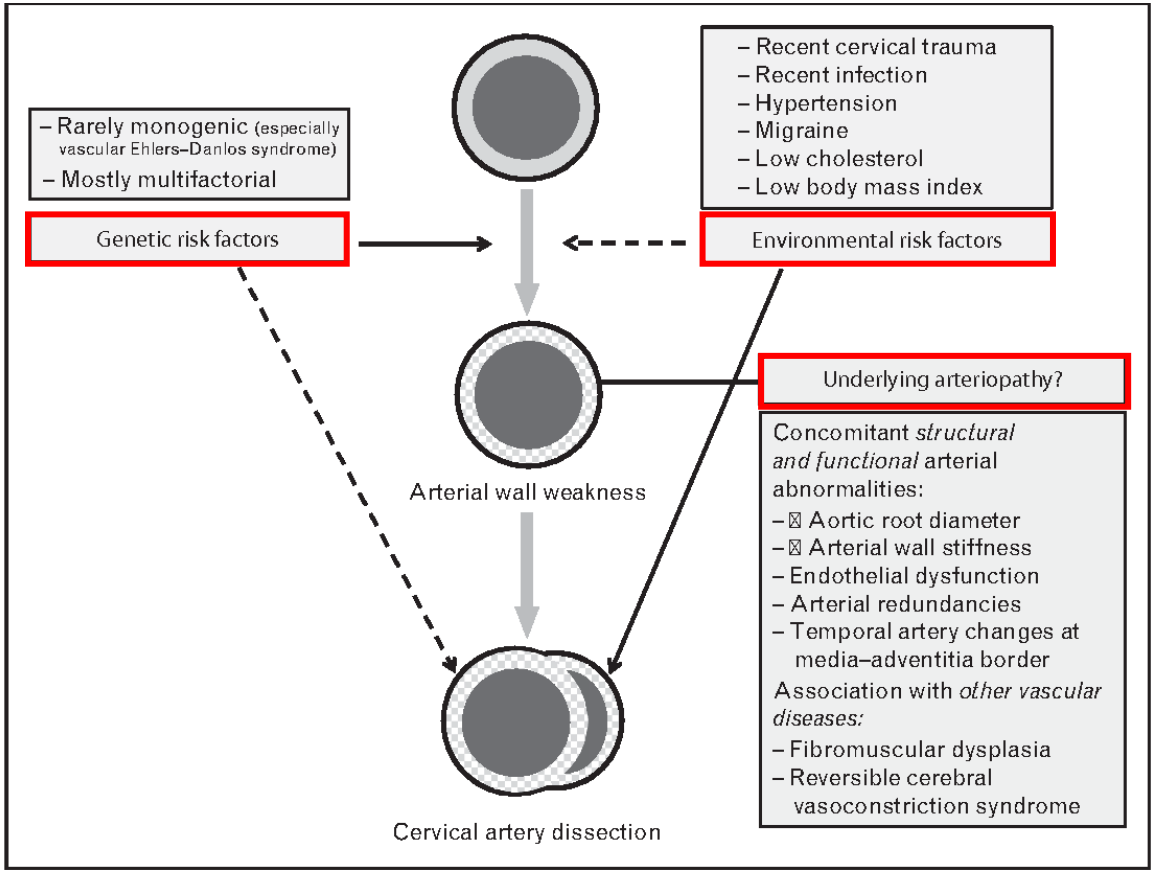
Stephanie Debette[1,2], Mikael Mazighi[3,4,5,6,7], Philippe Bijlenga[8], Alessandro Pezzini[9], Masatoshi Koga[10], Anna Bersano[11], Janika Kõrv[12,13], Julien Haemmerli[8], Isabella Canavero[11], Piotr Tekiela[14], Kaori Miwa[10], David J Seiffge[15], Sabrina Schilling[16], Avtar Lal[16], Marcel Arnold[15], Hugh S Markus[17], Stefan T Engelter[18,19] and Jennifer J Majersik[14]

Pathofysiologie CAD



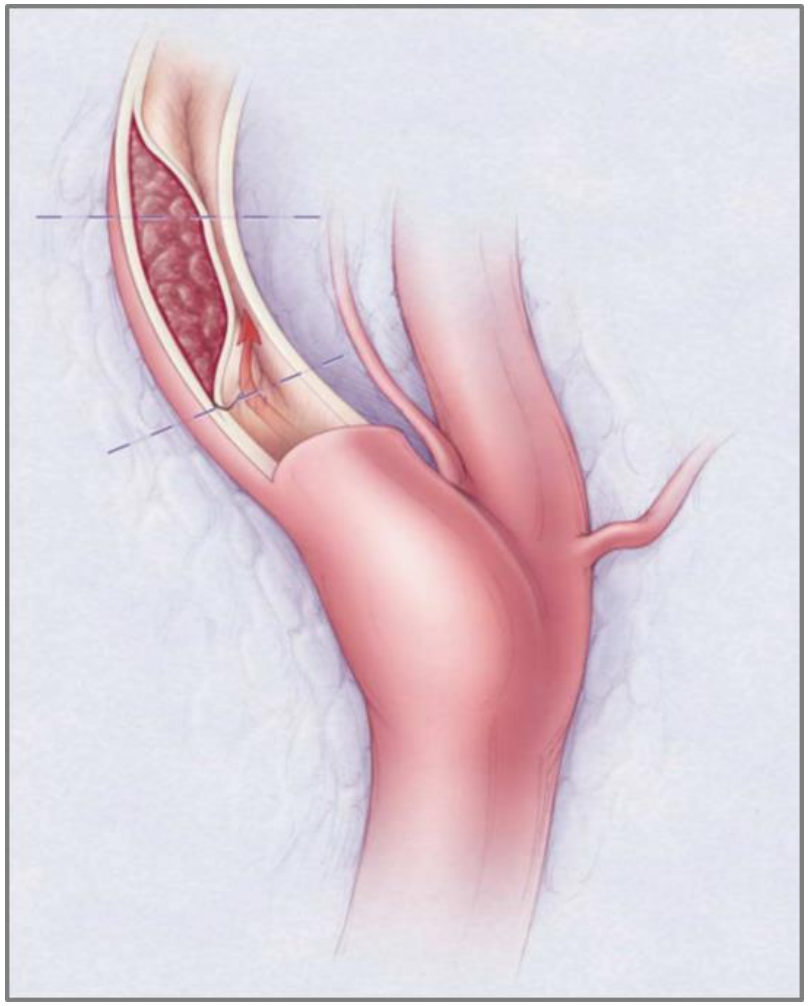
Steinsiepe, 2014

Etiologie



Debette, 2014

Epidemiologie



2,6/100.000

♀ < ♂

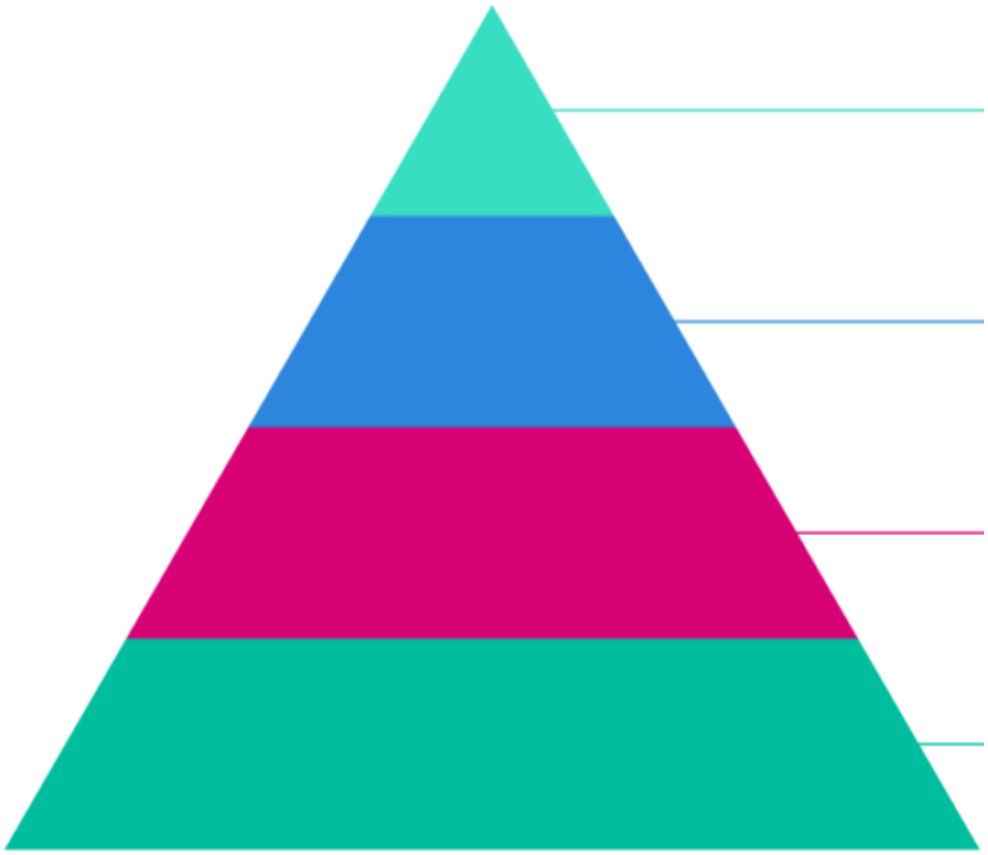
mediaan 45 jr

ICA : VA = 3:2

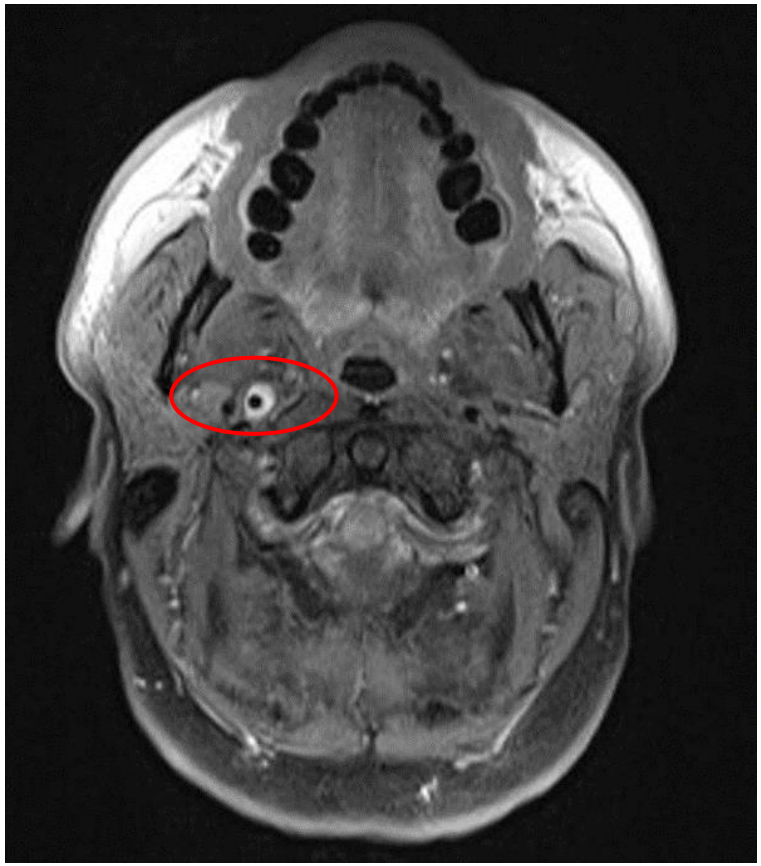
multipel in 15%

Lee, 2006
Blum, 2015

Epidemiologie



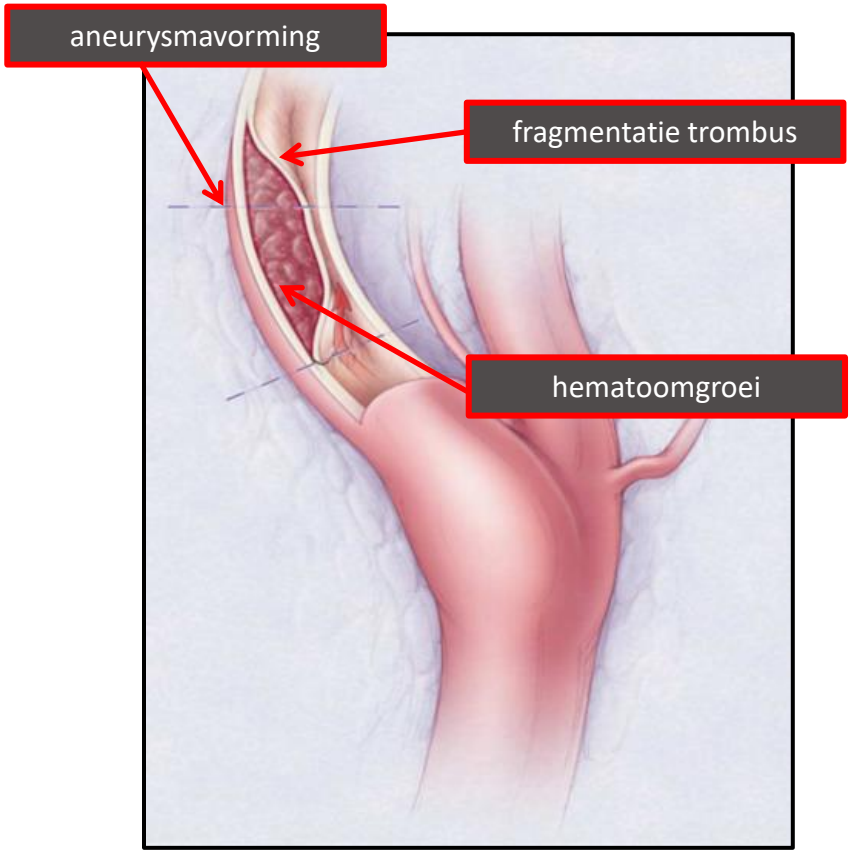
Beeldvorming



Acute behandeling CAD

Intraveneuze trombolyse (IVT)

Potentiele risico's



alleen retrospectieve data

IVT - veiligheid

	N	SICH	%	mortaliteit	%
Zinkstok (2011)	121	3/121	3,3 (1,0 - 8,5)	8/120	6,7 (2,2 - 11,1)
Qureshi (2011)	488	-	6,9	-	11,2
Tsivgoulis (2015)	234	-	2,0 (0,0 - 5,0)	-	4,0 (0,0 - 8,0)
Lin (2016)	174	0/152	0,0	5/152	3,3

IVT - effectiviteit

	CAD IVT		
	N	mRS 0-1	% (95% BI)
Zinkstok (2011)	121	40/120	41,0 (25,5-42,2)
Qureshi (2011)	488	-	30,4
Tsivgoulis (2015)	234	26/83	31,3
Lin (2016)	174	50/150	33,3

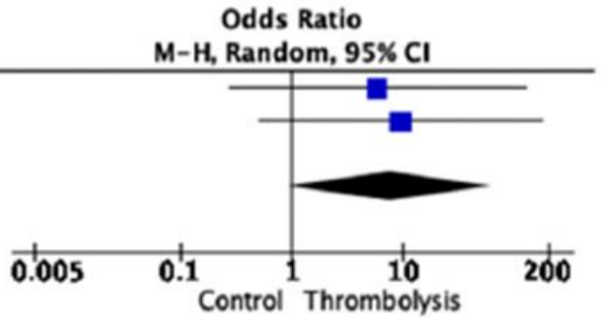
IVT vs no IVT - effectiviteit

SICH

(b)

Study or Subgroup	Thrombolysis Events	Total	Control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Bernardo 2019	2	38	0	43	47.9%	5.96 [0.28, 128.12]
Engelter 2012	4	64	0	64	52.1%	9.60 [0.51, 181.99]
Total (95% CI)		102		107	100.0%	7.64 [0.91, 63.86]
Total events	6		0			

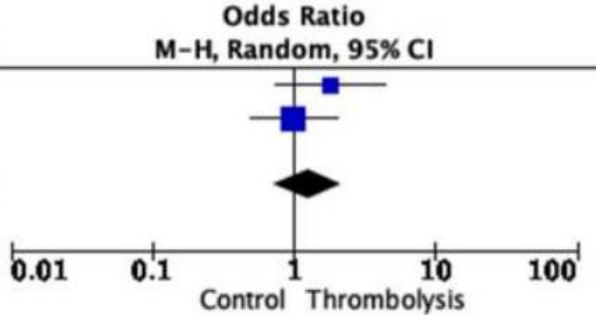
Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.05$, df = 1 (P = 0.83); $I^2 = 0\%$
Test for overall effect: Z = 1.88 (P = 0.06)



mRS 0-2

Study or Subgroup	Thrombolysis Events	Total	Control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Bernardo 2019	26	38	24	44	37.5%	1.81 [0.73, 4.47]
Engelter 2012	35	64	35	64	62.5%	1.00 [0.50, 2.01]
Total (95% CI)		102		108	100.0%	1.25 [0.71, 2.19]
Total events	61		59			

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 1.03$, df = 1 (P = 0.31); $I^2 = 3\%$
Test for overall effect: Z = 0.77 (P = 0.44)



Debette, 2021

IVT - aanbeveling

- Pas bij patiënten met een herseninfarct door CAD IVT met alteplase toe < 4, 5 uur (bewijsgraad: laag)

Endovasculaire behandeling (EVT)

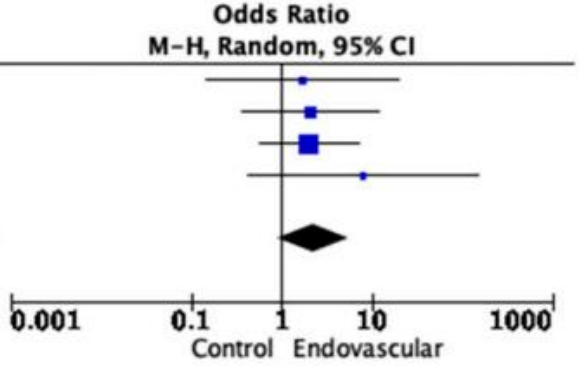
- alleen retrospectieve data
- trombectomie
- bridging
- stent

EVT vs no EVT

SICH

Study or Subgroup	Endovascular Events	Total	Control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Bernardo 2019	1	24	2	81	13.7%	1.72 [0.15, 19.80]
LI 2018	4	48	2	48	26.8%	2.09 [0.36, 12.00]
Marnat 2020	7	65	4	71	50.1%	2.02 [0.56, 7.25]
Traenka 2018	5	38	0	24	9.4%	8.04 [0.42, 152.41]
Total (95% CI)		175		224	100.0%	2.27 [0.92, 5.61]
Total events	17		8			

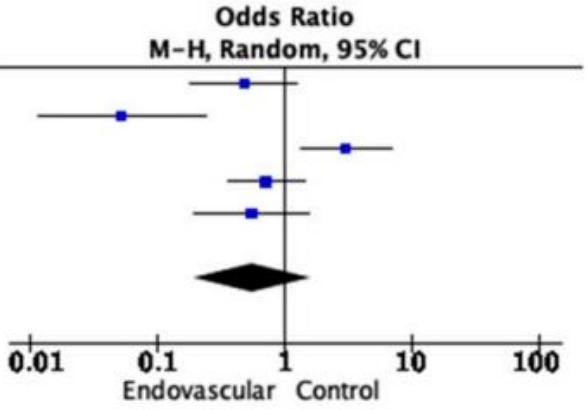
Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.83$, df = 3 ($P = 0.84$); $I^2 = 0\%$
Test for overall effect: $Z = 1.78$ ($P = 0.08$)



mRS 0-2

Study or Subgroup	Endovascular Events	Total	Control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Bernardo 2019	9	21	50	82	20.3%	0.48 [0.18, 1.27]
Jensen 2017	2	20	93	137	16.3%	0.05 [0.01, 0.24]
LI 2018	32	48	19	48	21.3%	3.05 [1.33, 7.03]
Marnat 2020	35	65	44	71	22.3%	0.72 [0.36, 1.42]
Traenka 2018	15	38	13	24	19.8%	0.55 [0.20, 1.55]
Total (95% CI)		192		362	100.0%	0.56 [0.19, 1.59]
Total events	93		219			

Heterogeneity: $Tau^2 = 1.17$; $Chi^2 = 24.40$, df = 4 ($P < 0.0001$); $I^2 = 84\%$
Test for overall effect: $Z = 1.09$ ($P = 0.27$)



Debette, 2021

SICH EVT – CAD vs no CAD

	CAD EVT		No CAD EVT		
	N	**SICH**	**N**	**SICH**	**p of OR (95% BI)**
Marnat (2016)	20	1/20 (5,0)	201	9/201 (4,5)	0,49
Jensen (2017)	24	1/24 (4,2)	421	27/421 (6,4)	-
Compagne (2019)	74	4/74 (5,4)	92	10/92 (10,9)	1.72 (0.84–3.50)
Karam (2021)	43	3/43 (7,0)	86	4/86 (4,7)	1,54 (0,33-2,79)

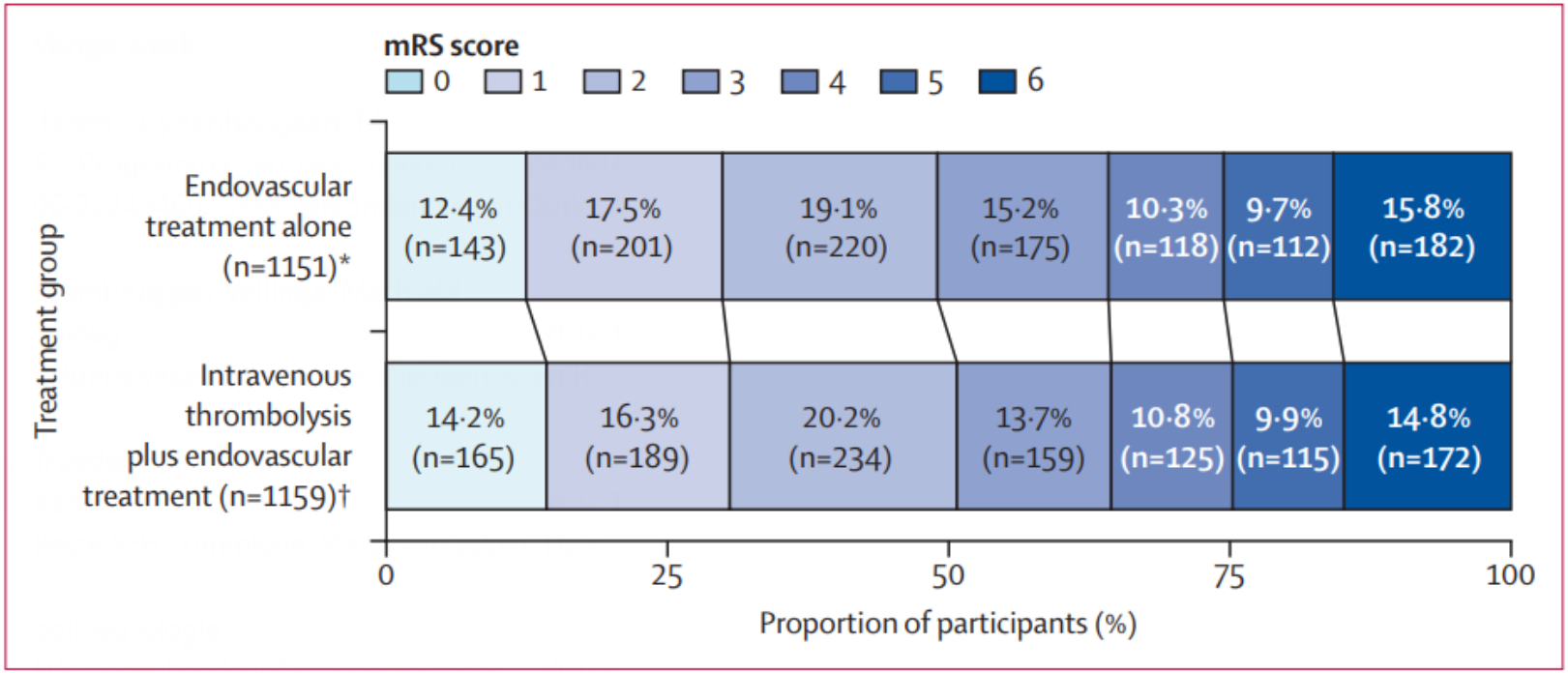
Outcome EVT – CAD vs no CAD

	CAD EVT		No CAD EVT		
	N	**mRS 0-2**	**N**	**mRS 0-2**	**p of OR (95% BI)**
Marnat (2016)	20	14/20 (70,0)	201	92/183 (50,3)	0,09
Jensen (2017)	24	13/20 (65,0)	421	145/270 (53,7)	0,58 (0,30-5,00)
Compagne (2019)	74	36/70 (51,4)	92	27/90 (30,0)	1,72 (0.84–3.50)
Karam (2021)	43	24/43 (55,8)	86	43/86 (50,0)	1,26 (0,61-2,64)

EVT aanbeveling

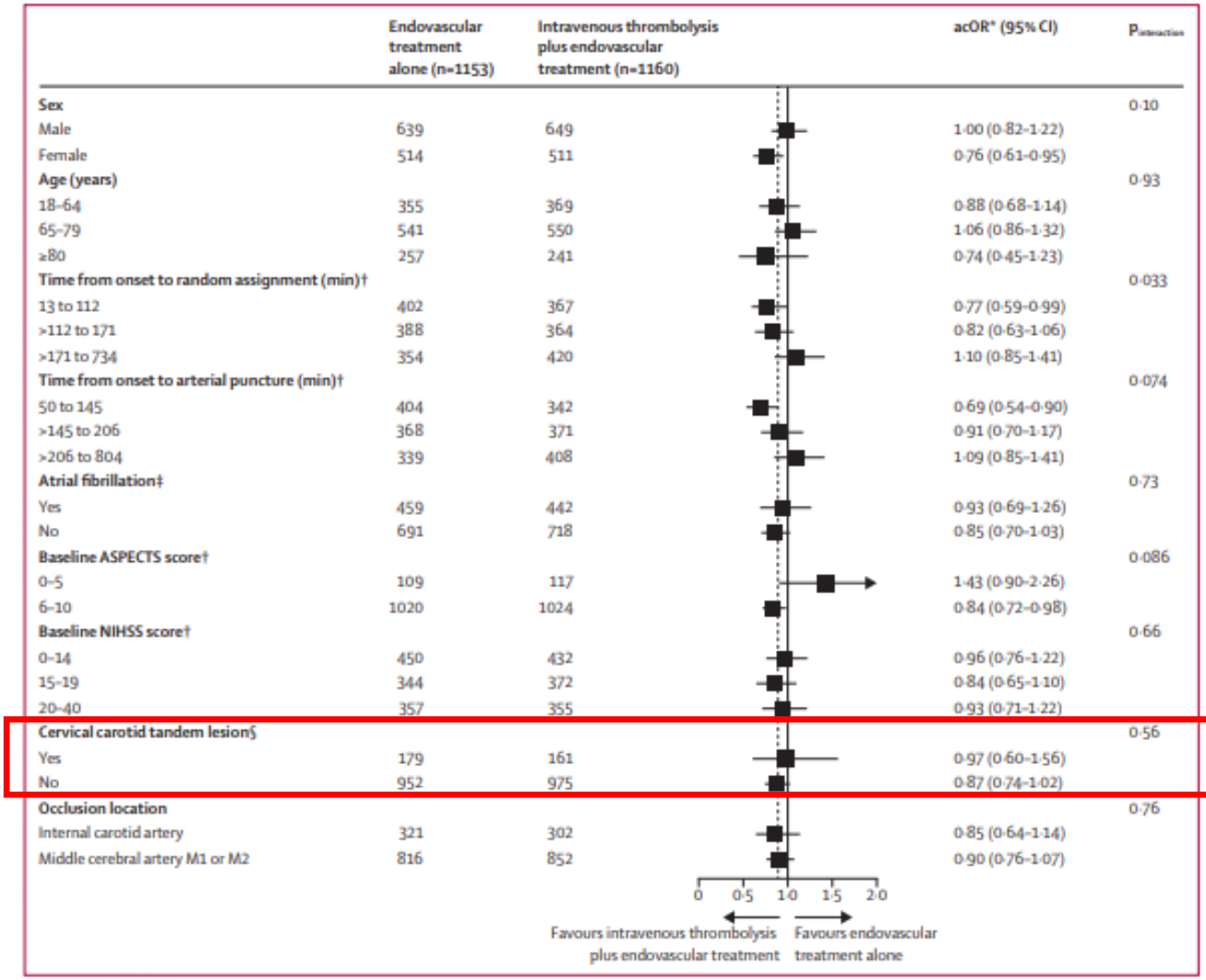
- Pas bij CAD patiënten met een proximale occlusie van de voorste circulatie mechanische trombectomie toe (bewijsgraad: zeer laag)

Alleen EVT vs bridging



Majoie, 2023

Bridging bij tandem occlusie



	Endovascular treatment alone (n=1153)	Intravenous thrombolysis plus endovascular treatment (n=1160)	acOR* (95% CI)	$P_{interaction}$
Sex				0·10
Male	639	649	1·00 (0·82–1·22)	
Female	514	511	0·76 (0·61–0·95)	
Age (years)				0·93
18–64	355	369	0·88 (0·68–1·14)	
65–79	541	550	1·06 (0·86–1·32)	
≥80	257	241	0·74 (0·45–1·23)	
Time from onset to random assignment (min)†				0·033
13 to 112	402	367	0·77 (0·59–0·99)	
>112 to 171	388	364	0·82 (0·63–1·06)	
>171 to 734	354	420	1·10 (0·85–1·41)	
Time from onset to arterial puncture (min)†				0·074
50 to 145	404	342	0·69 (0·54–0·90)	
>145 to 206	368	371	0·91 (0·70–1·17)	
>206 to 804	339	408	1·09 (0·85–1·41)	
Atrial fibrillation‡				0·73
Yes	459	442	0·93 (0·69–1·26)	
No	691	718	0·85 (0·70–1·03)	
Baseline ASPECTS score†				0·086
0–5	109	117	1·43 (0·90–2·26)	
6–10	1020	1024	0·84 (0·72–0·98)	
Baseline NIHSS score†				0·66
0–14	450	432	0·96 (0·76–1·22)	
15–19	344	372	0·84 (0·65–1·10)	
20–40	357	355	0·93 (0·71–1·22)	
Cervical carotid tandem lesion§				0·56
Yes	179	161	0·97 (0·60–1·56)	
No	952	975	0·87 (0·74–1·02)	
Occlusion location				0·76
Internal carotid artery	321	302	0·85 (0·64–1·14)	
Middle cerebral artery M1 or M2	816	852	0·90 (0·76–1·07)	

Majoie, 2023

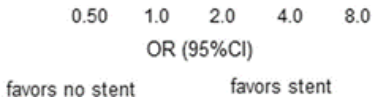
Bridging in CAD - ETIS & TITAN

Outcome	Intravenous thrombolysis		Unadjusted		Adjusted††	
	No (n=50)	Yes (n=94)	Effect size (95% CI)	*P*	Effect size (95% CI)	*P*
Angiographic outcomes						
Successful reperfusion	32/50 (64.0)	78/94 (83.0)	2.74 (1.24 to 6.04)*	0.012	2.63 (1.12 to 6.15)*	0.025
First pass effect	14/50 (28.0)	33/94 (35.1)	1.39 (0.65 to 2.95)*	0.39	1.31 (0.87 to 1.42)*	0.33
Groin puncture to reperfusion (min)†	70 (40 to 87)†	72 (50 to 89)†	0.07 (–0.18 to 0.32)§	0.56	0.11 (–0.14 to 0.35)§	0.38
Number of passes	2 (1 to 3)†	2 (1 to 3)†	1.10 (0.57 to 2.10)‖	0.78	1.38 (0.70 to 2.68)‖	0.35
Procedural complications‡‡	9/50 (18.0)¶	9/94 (9.6)¶	0.48 (0.17 to 1.31)*	0.15	0.46 (0.15 to 1.33)*	0.15
Clinical outcomes						
90-day favorable outcome	22/46 (47.8)	57/91 (62.6)	1.83 (0.89 to 3.75)*	0.099	1.69 (0.80 to 3.54)*	0.16
90-day excellent outcome	6/46 (13.0)	36/91 (39.6)	4.36 (1.67 to 11.34)*	0.003	4.23 (1.60 to 11.18)*	0.004
90-day mortality	6/46 (13.0)	4/91 (4.4)	0.32 (0.08 to 1.12)*	0.079	0.43 (0.11 to 1.63)*	0.21
24-hour change in NIHSS	0.2 (–2.2 to 2.7)**	3.2 (1.4 to 5.0)**	2.9 (–0.1 to–5.9)††	0.056	3.6 (0.6 to 4.6)††	0.018
24-hour change in ASPECTS	1.8 (1.2 to 2.4)‖	1.1 (0.6 to 1.5)‖	–0.8 (–1.5 to –0.1)**	0.028	–0.8 (–1.6 to –0.03)**	0.040
Day-1 patency of extracranial ICA	14/37 (37.8)	23/58 (39.7)	1.08 (0.46 to 2.52)*	0.86	0.69 (0.26 to 1.79)*	0.44
Any ICH	24/39 (61.5)	29/70 (41.4)	0.44 (0.19 to 0.99)*	0.046	0.41 (0.17 to 0.96)*	0.042
Parenchyma hematoma	7/39 (18.0)	6/70 (8.6)	0.43 (0.13 to 1.38)*	0.16	0.38 (0.11 to 1.29)*	0.14
sICH	7/47 (14.8)	4/94 (4.3)	0.25 (0.07 to 0.92)*	0.036	0.21 (0.05 to 0.80)*	0.021

Marnat, 2021

Carotid Stenting - ETIS & TITAN

	No stent (n=262)	Stent (n=341)	IPTW adjusted* OR (95%CI)	p-value	p-het
Overall	118/262 (45.0)	194/341 (57.0)	1.09 (1.01 to 1.19)	0.036	



Anadani, 2021

Carotid Stenting - ETIS & TITAN

Characteristics	Extracranial CAS		Unadjusted*		Adjusted†	
	No (n=71)	Yes (n=65)	OR (95% CI)	*P* value	OR (95% CI)	*P* value
Angiographic outcomes						
mTICI 2b/3	48 (67.6)	58 (89.2)	3.97 (1.57 to 10.05)	0.004	2.24 (1.33 to 3.77)	0.002
mTICI 3	17 (23.9)	22 (33.9)	1.63 (0.77 to 3.45)	0.20	2.20 (1.70 to 3.22)	0.25
Procedural complications	10 (14.1)	6 (9.2)	0.62 (0.21 to 1.81)	0.38	0.74 (0.42 to 1.31)	0.30
Patency of extracranial carotid artery	37 (52.0)	52 (80.2)	3.79 (1.52 to 9.45)	0.005	1.82 (1.14 to 2.91)	0.013
Clinical outcomes						
90-day favorable outcome‡	44 (61.4)	35 (54.3)	0.75 (0.37 to 1.49)	0.41	0.84 (00.58 to 1.22)	0.36
90-day mortality	4 (5.8)	5 (8.0)	1.42 (0.36 to 5.56)	0.62	1.00 (0.48 to 2.09)	0.99
24 h change in NIHSS, mean (95% CI)§	−2.3 (−4.1 to −0.5)	−2.7 (−4.9 to −0.5)	−0.40 (−3.25 to 2.46)‖	0.78	−0.68 (−3.61 to 2.24)¶	0.65
Hemorrhagic complications						
sICH	4 (5.6)	7 (10.8)	2.02 (0.56 to 7.25)	0.28	1.59 (0.79 to 3.17)	0.19

Marnat, 2020

Secundaire preventie

Wat schrijft u voor als secundaire preventie bij CAD?

A) clopidogrel

B) ASA

C) DOAC

D) LMWH / vitamine K antagonist

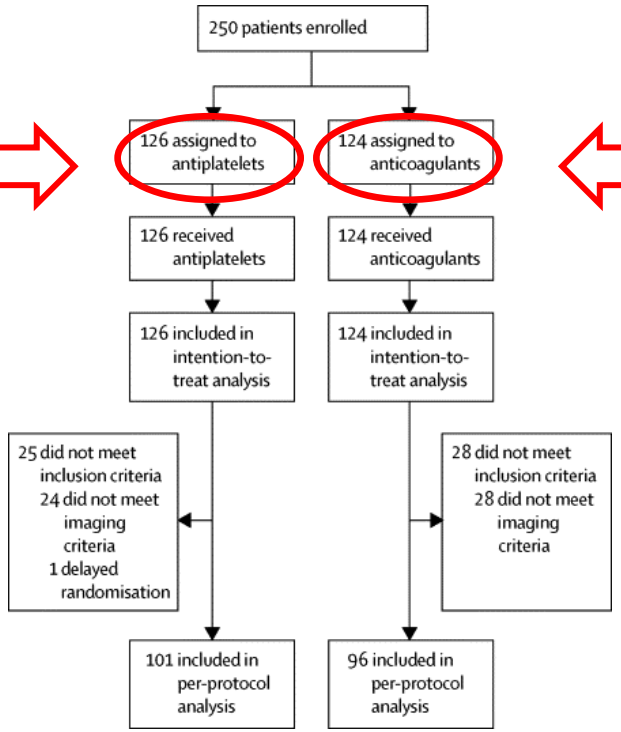
Secundaire preventie: CADISS

Antiplatelet treatment compared with anticoagulation treatment for cervical artery dissection (CADISS): a randomised trial

The CADISS trial investigators*

ASA, dipy en/of clopidogrel

(LMW)H → warfarine



Markus, 2015

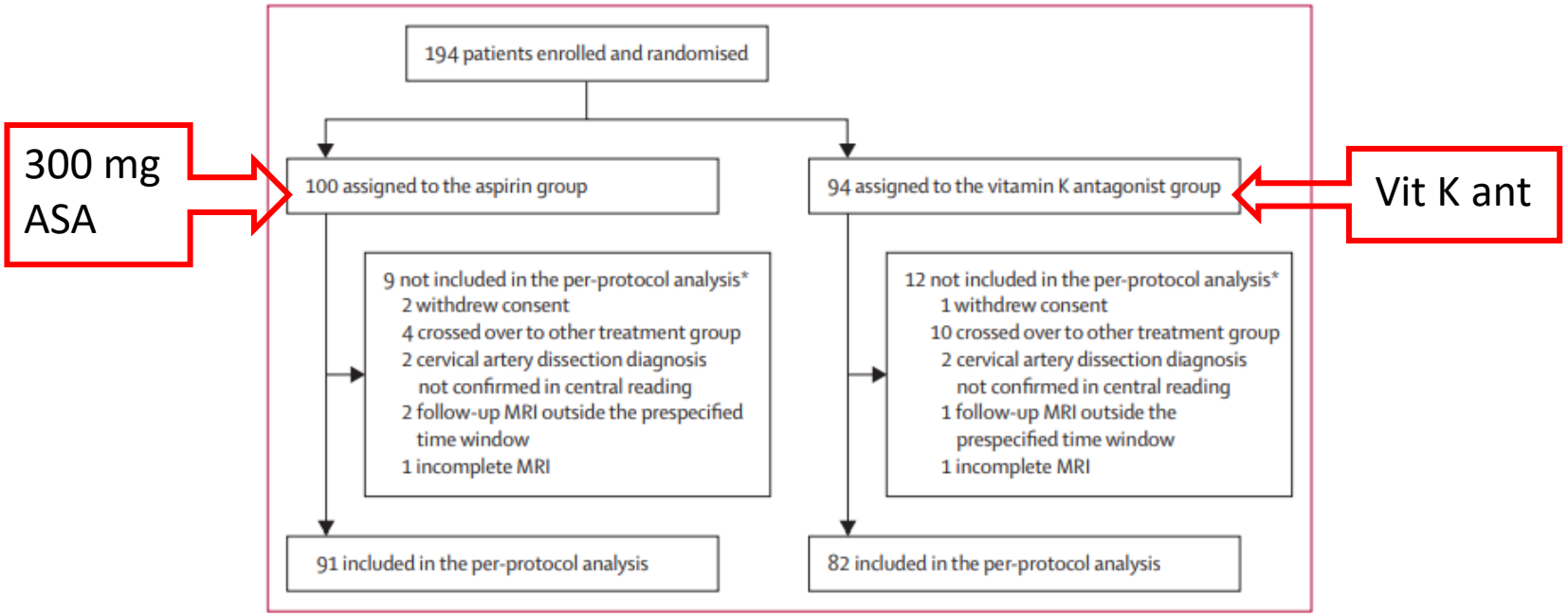
Uitkomsten CADISS – 3 maanden

	Intention-to-treat population				Per-protocol population			
	Antiplatelet group (n=126)	Anticoagulant group (n=124)	OR (95% CI)*	p value	Antiplatelet group (n=101)	Anticoagulant group (n=96)	OR (95% CI)*	p value
Ipsilateral stroke or death	3 (2%)	1 (1%)	0·335 (0·006–4·233)	0·63	3 (3%)	1 (1%)	0·346 (0·006–4·390)	0·66
Secondary endpoints								
Any stroke or death	3 (2%)	1 (1%)	0·335 (0·006–4·233)	0·63	3 (3%)	1 (1%)	0·346 (0·006–4·390)	0·66
Any stroke, death, or major bleed	3 (3%)	2 (2%)	0·673 (0·055–5·983)	1·00	3 (3%)	2 (2%)	0·696 (0·057–6·220)	1·00
Any stroke	3 (2%)	1 (1%)	0·335 (0·006–4·233)	0·63	3 (3%)	1 (1%)	0·346 (0·006–4·390)	0·66
Ipsilateral stroke, TIA, or death	4 (3%)	5 (4%)	1·280 (0·268–6·614)	0·98	4 (4%)	4 (4%)	1·054 (0·190–5·835)	1·00
Any stroke or TIA	5 (4%)	5 (4%)	1·017 (0·228–4·540)	1·00	5 (5%)	4 (4%)	0·836 (0·161–4·015)	1·00
Major bleeding	0 (0%)	1 (1%)	..	..	0 (0%)	1 (1%)	..	..
Death	0 (0%)	0 (0%)	..	..	0 (0%)	0 (0%)	..	..

Markus, 2015

Secundaire preventie: TREAT-CAD

Aspirin versus anticoagulation in cervical artery dissection (TREAT-CAD): an open-label, randomised, non-inferiority trial



Engelter, 2021

Uitkomsten TREAT CAD

	Per-protocol population (n=173)		Full analysis set population (n=194)	
	Aspirin group (n=91)	Vitamin K antagonist group (n=82)	Aspirin group (n=100)*	Vitamin K antagonist group (n=94)†
Primary endpoint				
Composite of clinical outcomes and MRI outcomes	21 (23%)	12 (15%)	22 (23%)	12 (13%)
Clinical outcomes	7 (8%)	1 (1%)	7 (7%)	1 (1%)
Ischaemic stroke	7 (8%)‡	0	7 (7%)‡	0
Major extracranial haemorrhage	0	1 (1%)	0	1 (1%)
Symptomatic intracranial haemorrhage	0	0	0	0
Death	0	0	0	0
MRI outcomes (all)	20 (22%)	11 (13%)	21 (22%)	11 (12%)
New acute ischaemic brain lesion	9 (10%)	6 (7%)	10 (10%)	6 (6%)
New haemorrhagic brain lesion	9 (10%)	4 (5%)	9 (9%)	4 (4%)
New acute ischaemic and haemorrhagic lesion	2 (2%)	1 (1%)	2 (2%)	1 (1%)
MRI outcomes without symptoms	14 (15%)	11 (13%)	15 (15%)	11 (12%)
New acute ischaemic brain lesion	3 (3%)	6 (7%)	4 (4%)	6 (6%)
New haemorrhagic brain lesion	9 (10%)	4 (5%)	9 (9%)	4 (4%)
New acute ischaemic and new haemorrhagic lesion	2 (2%)	1 (1%)	2 (2%)	1 (1%)
Secondary endpoints				
Recurrent dissection	3 (3%)	2 (2%)	3 (3%)§	2 (2%)¶
Increase of vessel wall haematoma	1 (1%)	1 (1%)	1 (1%)§	5 (5%)¶
Transient ischaemic attack	0	2 (2%)	0§	2 (2%)¶
Excellent functional outcome (mRS score 0–1 at 3 months)	70 (77%)	62 (77%)¶	78 (79%)¶	72 (78%)‖
Independence in activities of daily living (mRS score 0–2 at 3 months)	88 (97%)	80 (99%)¶	96 (97%)¶	90 (98%)‖

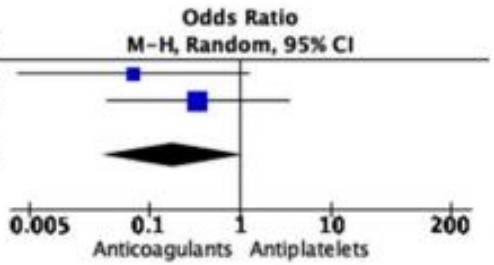
Engelter, 2021

TAR vs VKA – meta-analyse

Recidief stroke

Study or Subgroup	Anticoagulants Events	Total	Antiplatelets Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Engelter 2021	0	82	7	91	38.6%	0.07 [0.00, 1.21]
Markus 2019	1	96	3	101	61.4%	0.34 [0.04, 3.36]
Total (95% CI)		178		192	100.0%	0.18 [0.03, 1.10]
Total events	1		10			

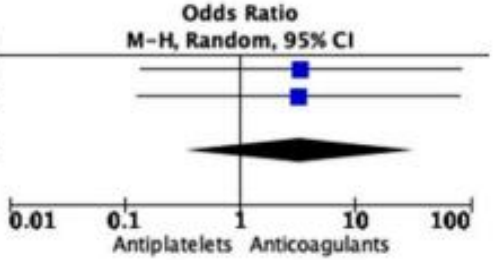
Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.80$, $df = 1$ ($P = 0.37$); $I^2 = 0\%$
Test for overall effect: $Z = 1.85$ ($P = 0.06$)



SICH

Study or Subgroup	Anticoagulants Events	Total	Antiplatelets Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Engelter 2021	1	82	0	91	50.0%	3.37 [0.14, 83.83]
Markus 2019	1	96	0	101	50.0%	3.19 [0.13, 79.23]
Total (95% CI)		178		192	100.0%	3.28 [0.34, 31.80]
Total events	2		0			

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.00$, $df = 1$ ($P = 0.98$); $I^2 = 0\%$
Test for overall effect: $Z = 1.02$ ($P = 0.31$)



Debette, 2021

Sec preventie - aanbeveling

- Schrijf bij een symptomatische CAD plaatjesremmers of anticoagulantia voor
  - Mate van bewijs: gemiddeld

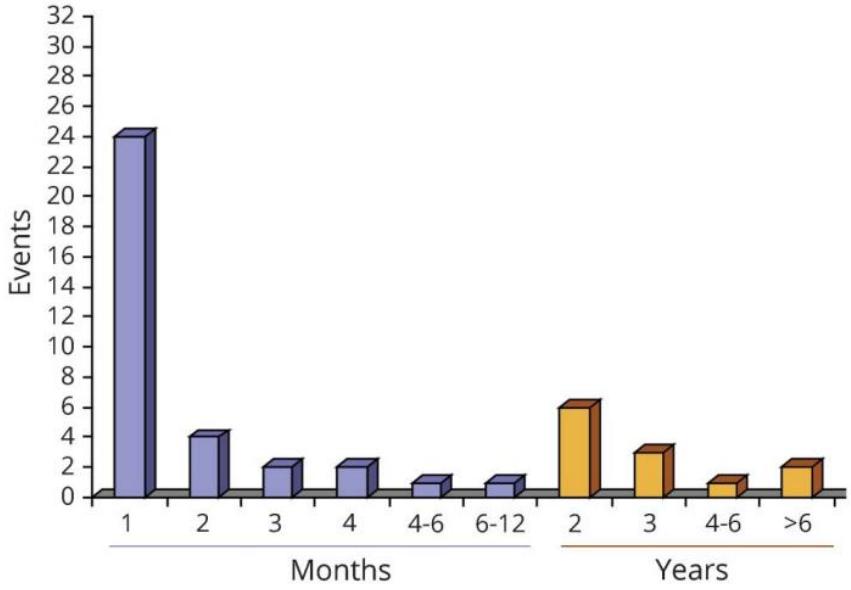
Secundaire preventie: DOAC?

Variable	NOAC (n = 39)	AC (n = 70)	AP (n = 40)	Total (n = 149)	p value
Demographics					
Female sex	22 (56.4)	49 (70.0)	23 (57.5)	94 (63.1)	0.257
Age, years	42.3±12.1	41.4±15.0	48.1±13.2	43.4±14.0	0.042
Migraine	7 (17.9)	13 (18.6)	6 (15.0)	26 (17.4)	0.889
Hypertension	10 (25.6)	13 (18.6)	8 (20.0)	31 (20.8)	0.677
Diabetes	1 (2.6)	1 (1.4)	1 (2.5)	3 (2.0)	0.892
Hyperlipidemia	6 (15.4)	7 (10.0)	3 (7.5)	16 (10.7)	0.508
Prior stroke	0 (0.0)	3 (4.3)	0 (0.0)	3 (2.0)	0.178
Atrial fibrillation	0 (0.0)	2 (2.9)	1 (2.0)	3 (2.0)	0.576
Coronary artery disease	0 (0.0)	1 (1.4)	3 (7.5)	4 (2.7)	0.080
Presentation					
Headache	26 (66.7)	35 (50.0)	17 (42.5)	78 (52.3)	0.086
Neck pain	21 (34.4)	26 (37.1)	14 (35.0)	61 (40.9)	0.158
Ischemic symptoms	25 (64.1)	38 (54.3)	18 (45.0)	81 (54.4)	0.234
Explicit trauma	18 (46.2)	33 (47.1)	18 (45.0)	69 (46.3)	0.977
Clinical events on follow-up					
All hemorrhagic complications	2 (5.1)	11 (15.7)	2 (5.0)	15 (10.1)	0.369
Major hemorrhagic complications	0 (0.0)	8 (11.4)	1 (2.5)	9 (6.0)	0.034
Heartburn or peptic ulcer disease	1 (2.6)	1 (1.4)	2 (5.0)	4 (2.7)	0.810
Recurrent stroke	2 (5.1)	1 (1.4)	1 (2.5)	4 (2.7)	0.822
Imaging findings on follow-up					
Change in stenosis					
Resolved	11 (31.4)	23 (37.7)	14 (48.3)	48 (38.4)	0.090
Improved	10 (28.6)	17 (27.9)	4 (13.8)	31 (24.8)	
No change	11 (31.4)	21 (34.4)	11 (37.9)	43 (34.4)	
Worsened	3 (8.6)	0 (0.0)	0 (0.0)	3 (2.4)	

Caprio, 2014

Langetermijn follow-up

	First CeAD events (n = 238)
Ischemic stroke	164 (68.9)
TIA	25 (10.5)
Purely local symptoms	49 (20.6)
Asymptomatic	0

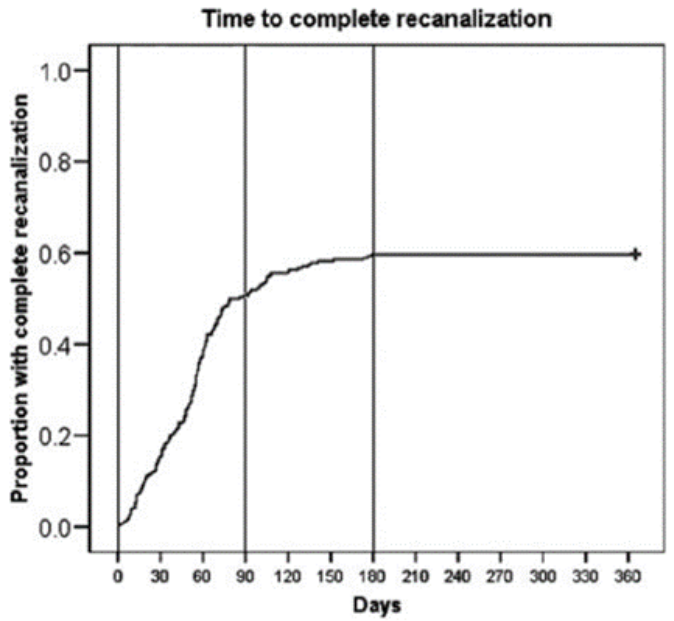


Kloss, 2018

Secundaire preventie: duur?

Angiografische data na 3 mnd (n=181)

- 61 (34%) geen afwijkingen
- 64 (35%) onregelmatigheid of stenose
- 45 (25%) occlusie
- 29 (16%) dissectie-aneurysma



Markus, 2019
Nedeltchev, 2009

Sec preventie - aanbeveling

- Expert opinion:

Continueer secundaire preventie na een CAD in geval van een residu stenose of aneurysma

Ahmed, 2017

TNN NEUROFARMACOTHERAPIE 69

tergooimc

Acutefasebehandeling en secundaire preventie van cervicale arteriële dissectie

Non-invasive medical treatment of cervical artery dissection

drs. A.H.P. Schalkwijk[1,4], dr. S. Akoudad[2,4], dr. G.J.R. Luijckx[2,4], dr. M. Uyttenboogaart[2,3,4]

Boodschappen

- Behandel een herseninfarct door een CAD in de acute fase als ieder ander herseninfarct
- Schrijf na een CAD plaatjesremming of antistolling voor
- Late recidieven komen voor maar zijn zelden ernstig

szinkstok@tergooi.nl

Pseudo-aneurysmata in CADISS

	In 248 patients with follow-up imaging at 3 months					
	Baseline			3 months		
DA	All	ICA	VA	All	ICA	VA
Yes	24 (9.7)	13 (11.3)	11 (8.3)	36 (14.5)	21 (18.3)	15 (11.3)
No	224 (90.3)	102 (88.7)	122 (91.7)	212 (85.5)	94 (81.7)	118 (88.7)

Risico stroke : 1/48 (2,1%) met DA versus 7/216 (3,2%) zonder DA

Larsson, 2017