

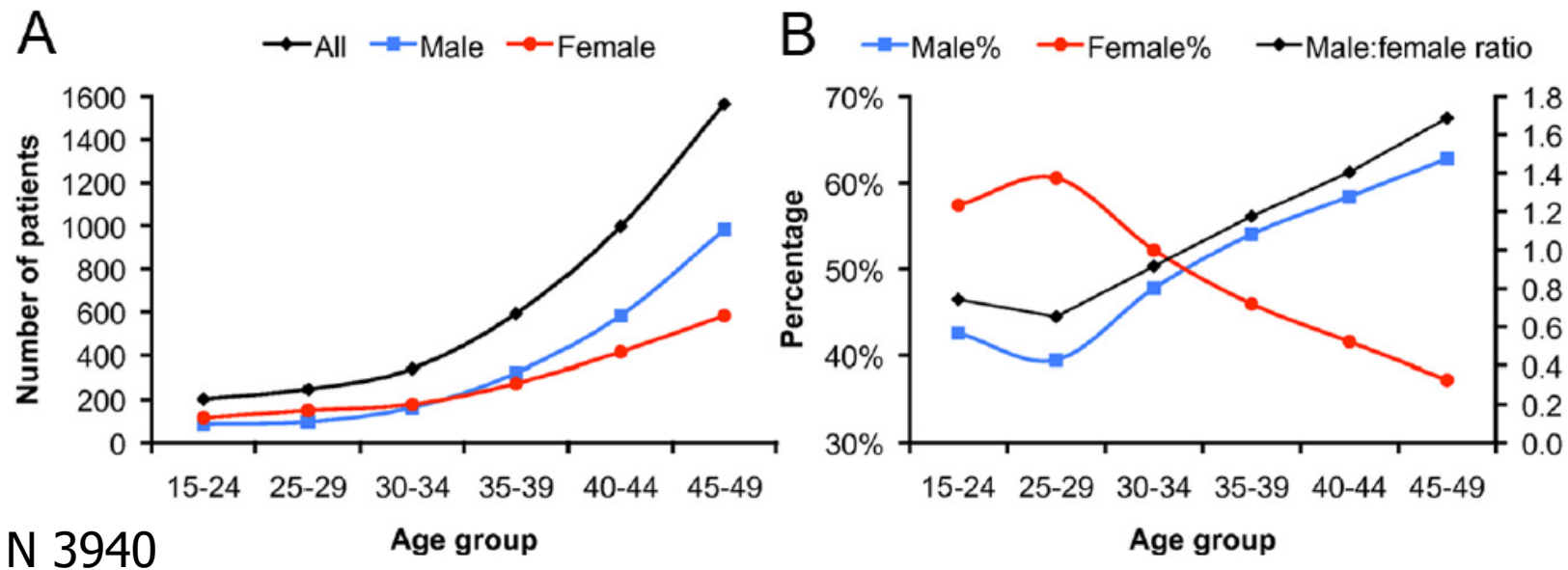


Jauno amžiaus insultas: diagnostikos algoritmas

Kristina Ryliškienė

Jaunas insultas: epidemiologija

- 10% iš viso išeminio insulto asmenų yra <50 m.
- Europoje dažnis 10/100 000 per metus (PY)
 - 2,4 20-24 m.
 - 4,5 30-34 m.
 - 32,9 45-49 m.
- Jaunas insultas dažnėja (daugėja tradicinių veiksnių)



Putala J, et al. Analysis of 1008 consecutive patients aged 15 to 49 with first-ever ischemic stroke: the Helsinki young stroke registry. *Stroke* 2009; 40(4): 1195–203. Putala J, et al. Demographic and geographic vascular risk factor differences in European young adults with ischemic stroke. *Stroke* 2012; 43: 2624–38. Kissela B, et al. Age at stroke: temporal trends in stroke incidence in a large, viracial population. *Neurology* 2012; 79: 1781–7. Maaijwee N, et al. Ischaemic stroke in young adults: risk factors and longterm consequences. *Nat Rev Neurol* 2014; 10: 315–25.

Kriptogeninis insultas

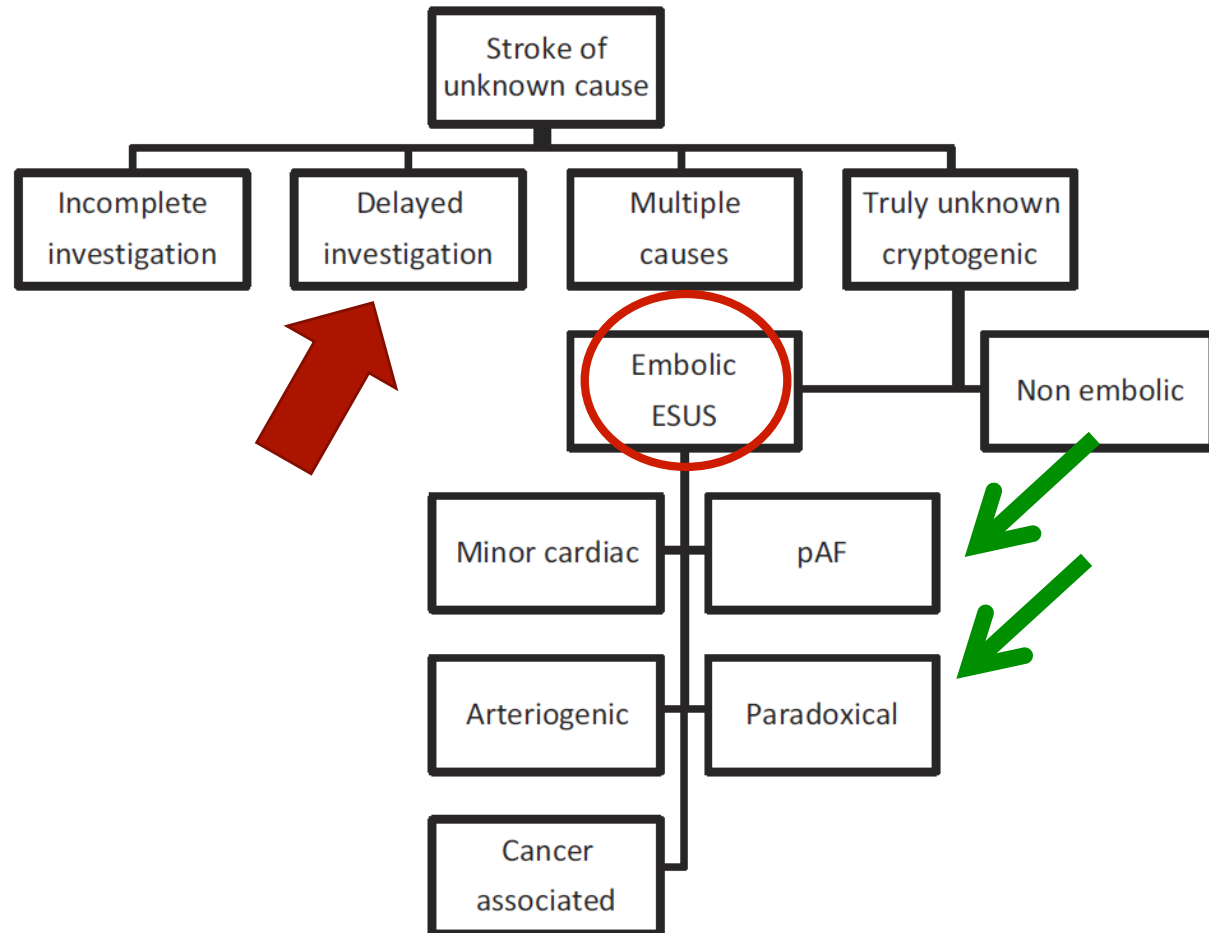
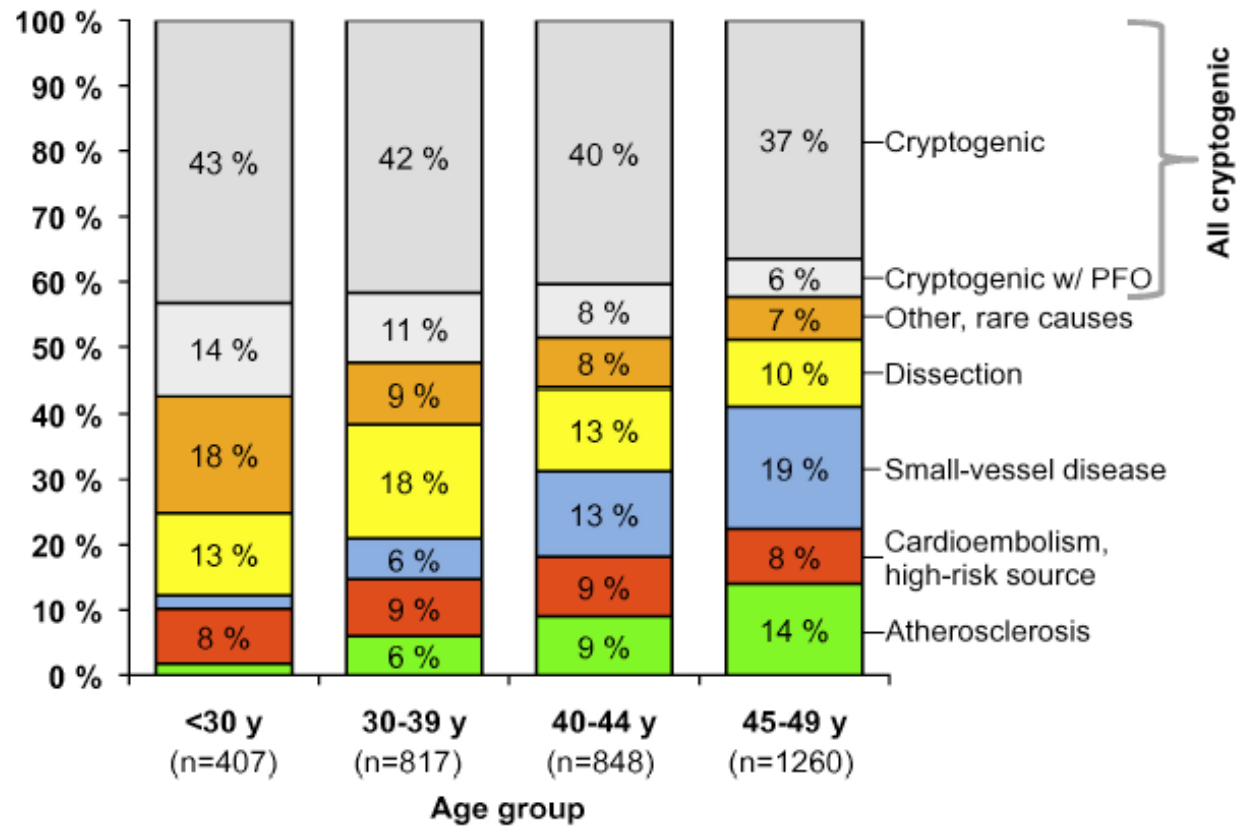


Figure 1 Stroke of unknown cause and embolic stroke of undetermined source. pAF, paroxysmal atrial fibrillation; ESUS, embolic stroke of undetermined source.

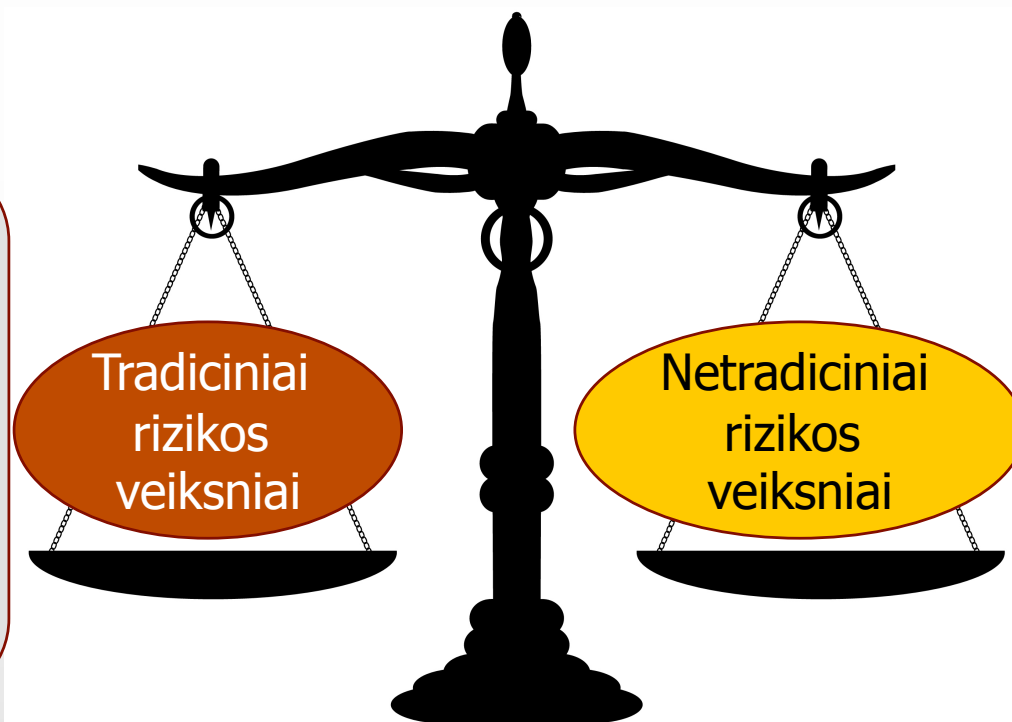
Figure 1. Proportion of etiologic subtypes in the 15 Cities Young Stroke Study (adapted from Yesilot-Barlas et al. Eur J Neurol 2013).



Jaunas insultas

- Ilgalaikis mirtingumas lyginant su sveikais bendraamžiais 4-10 k. didesnis, labiausiai siejamas su tradiciniais modifikuojamais kardiovaskulinės rizikos veiksniais
- Dažnesni nei vyresniems netradiciniai rizikos veiksniai, apie juos maža duomenų, neaiški jų reikšmė – II prevencija antiagregantais nepakankamai efektyvi

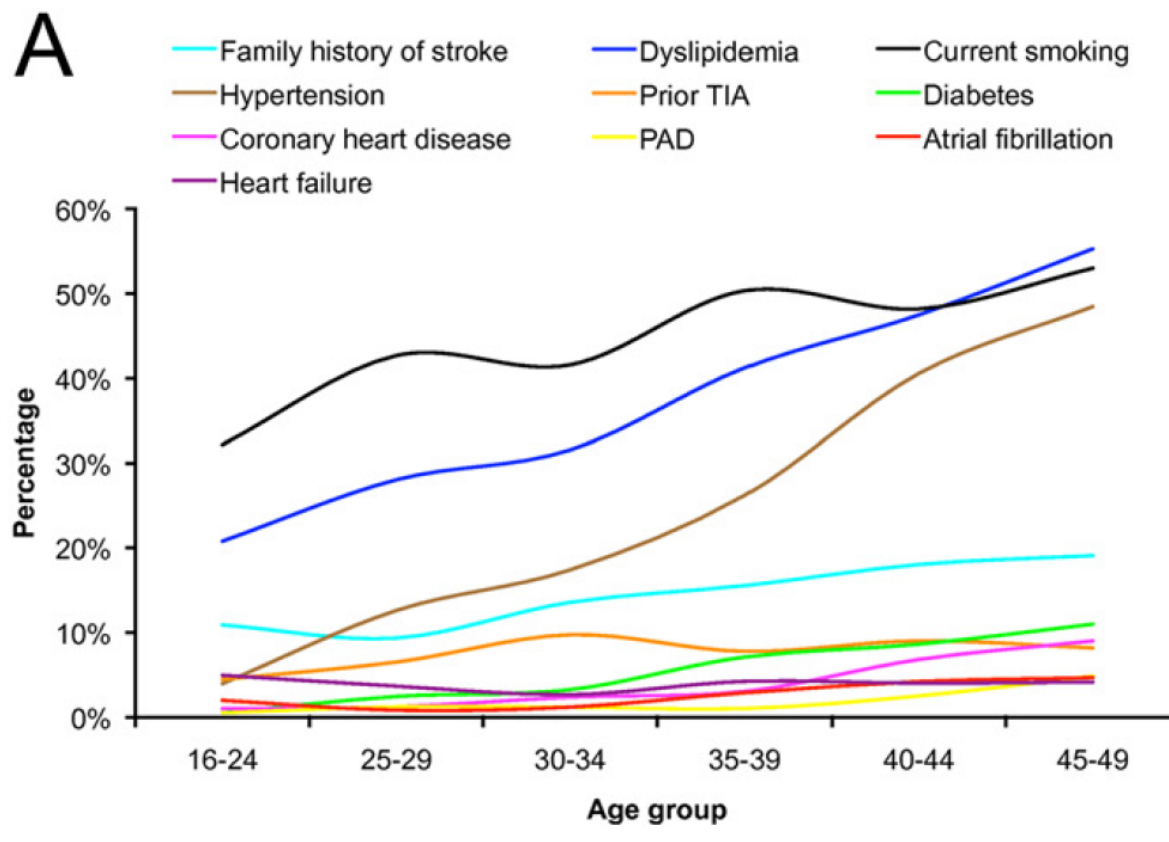
- Dažni, nepelnytai ignoruojami
- Turi ryšį su mirtingumu, negalia
- Yra II profilaktikos rekomendacijos



- Retesni nei tradiciniai
- Ryšys su insultu silpnas
- II profilaktika neturi tvirtų rekomendacijų

Neurology 2012; 79: 1781-7. Rutten-Jacobs L, et al. Long term mortality after stroke among adults aged 18-50 years. JAMA 2013; 309: 1136-44. Waje-Andreassen U, et al. Ischaemic stroke at a young age is a serious event - final results of a population-based long term follow-up in Western Norway. Eur J Neurol 2013; 20: 818-23. Maaijwee N, et al. Ischaemic stroke in young adults: risk factors and longterm consequences. Nat Rev Neurol 2014; 10: 315-25.

Tradicionių rizikos veiksnių paplitimas



- 1-10 cig/d OR 2,2
- >40 cig/d OR 9,1

Putaala J, et al. Demographic and geographic vascular risk factor differences in European young adults with ischemic stroke. Stroke 2012; 43: 2624-28. Ferro J, et al. Aetiological diagnosis of ischaemic stroke in young adults. Lancet Neurol 2010; 9: 1085-96.

Dažniausi netradiciniai jauno amžiaus insulto rizikos veiksniai

Table 1 | Top five most prevalent 'rare' risk factors for stroke in young* Western populations

Risk factor	TOAST classification [‡]	Prevalence in young patients with stroke [§]	Strength of association	Highest level of evidence
Migraine ^{99–103¶}	Unknown cause	20–24%	Pooled effect estimate ~2.0 ¹⁰⁴	A1, association proven for migraine with aura only
Illicit drug use ^{105–109}	Other (rare) causes	9–20%	OR 2.0 for cocaine; ¹⁰⁵ OR 2.3 for cannabis; ^{108#} no significant association for amphetamines ¹⁰⁵	A2 for cocaine; B for amphetamines, cannabis and heroin
Patent foramen ovale ^{110–113}	Possible cardiac embolism; low-risk source	24%, up to 50% in stroke, classified as cryptogenic	HR ~1.5 (nonsignificant) ¹¹¹	A2, contrasting with evidence from B-level studies
Oral contraceptives ^{102,114–119}	Other (rare) cause/unknown	10–40%	Summary OR 2.1 ¹¹⁵	B
Pregnancy/ puerperium ^{120–124}	Other (rare) cause/unknown	7.5% in women	Relative risk 8.7 during puerperium, not during pregnancy ¹²²	A2, conflicting results

*Under 50 years of age. [‡]TOAST classification, according to Ay *et al.* (2005).¹⁶ [§]Sum of all prevalences exceeds 100%, because data were extracted from different study populations. In addition, conditions are not mutually exclusive in an individual patient. ^{||}Levels of evidence: A1, systematic review, based on at least two independent A2-level studies; A2, prospective cohort study of sufficient sample size and duration of follow-up, adequately adjusted for confounding and selective follow-up sufficiently excluded; B, prospective cohort study, not meeting the criteria of A2, or retrospective cohort study, or case-control study; C, noncomparative study; D, expert opinion. [¶]Note that migrainous stroke is very rare;⁴³ however, reports on the role of migraine as a risk factor for stroke are abundant. [#]Not significant after correction for tobacco use.

Maaijwee N, *et al.* Ischaemic stroke in young adults: risk factors and longterm consequences. *Nat Rev Neurol* 2014; 10: 315-25.

Didelės rizikos AOA

AAN 2004 m.:
+ pasikartojantis
cerebrovaskulinis įvykis



- (1) History
 - (a) Sedentary period prior to onset
 - (b) Valsalva at onset
 - (c) Absence of common stroke risk factors
- (2) Anatomy
 - (a) Atrial septal aneurysm
 - (b) Large PFO size
 - (c) Prominent eustachian valve
- (3) Physiology
 - (a) Shunt at rest
 - (b) Spontaneous Doppler flow
 - (c) Many bubbles cross on contrast injection
- (4) Neuroimaging and laboratory testing
 - (a) Embolic stroke topography
 - (b) Hypercoagulable state

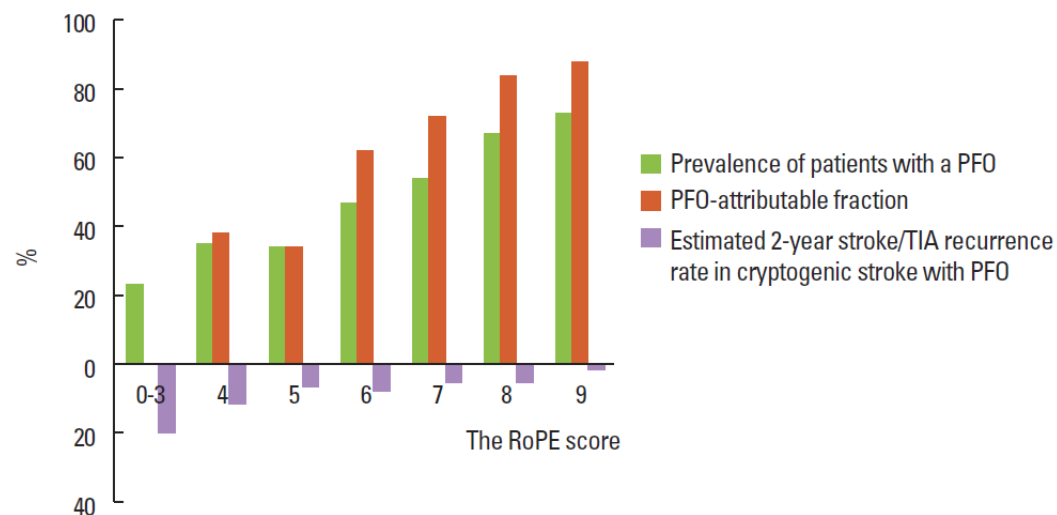
An index to identify stroke-related vs incidental patent foramen ovale in cryptogenic stroke

David M. Kent

Neurology® 2013;81:619-625

Table 4 RoPE score calculator

Characteristic	Points	RoPE score
No history of hypertension	1	
No history of diabetes	1	
No history of stroke or TIA	1	
Nonsmoker	1	
Cortical infarct on imaging	1	
Age, y		
18-29	5	
30-39	4	
40-49	3	
50-59	2	
60-69	1	
≥70	0	
Total score (sum of individual points)		
Maximum score (a patient <30 y with no hypertension, no diabetes, no history of stroke or TIA, nonsmoker, and cortical infarct)		10
Minimum score (a patient ≥70 y with hypertension, diabetes, prior stroke, current smoker, and no cortical infarct)		0



Abbreviation: RoPE = Risk of Paradoxical Embolism.

Bang O, et al. Patent foramen ovale and stroke – current status. J Stroke 2015; 17: 229-37.

Narkotinių medžiagų vartojimas

- 200 mln. = 4,8% populiacijos < 65 m.
- 25 mln. “*problem users*” – perdozavimo, savižudybių, AIDS, smurto rizika
- Dažnis tarp jauno insulto ligonių – mažai duomenų:
 - JAV 1998 m. 12,1% iš 422 ligonių 15-44 m., vienintelė priežastis 4,7%, dažniausiai vartojamas kokainas; dažniausiai vyrai, juodaodžiai, gausiai rūkantys, 25-39 m., retai + PAH ir CD
 - Suomija 2009 m. 1,3% iš 1008 18-49 m., dažniausiai <45 m., vienodai vyrai ir moterys
 - Pietų Australija 2011 m. 16% iš 326 15-50 m., 71% buvo kanapių vartotojai

Sloan M, et al. Illicit drug-associated ischemic stroke in the Baltimore-Washington young Stroke Study. Neurology 1998; 50: 1688-93. Putaala J, et al. Analysis of 1008 consecutive patients aged 15 to 49 with first-ever ischemic stroke. Stroke 2009; 40: 1195-203. Phillips M, et al. Ischemic stroke among young people aged 15-50 years in Adelaide, South Australia. MJA 2011; 195: 610-4.

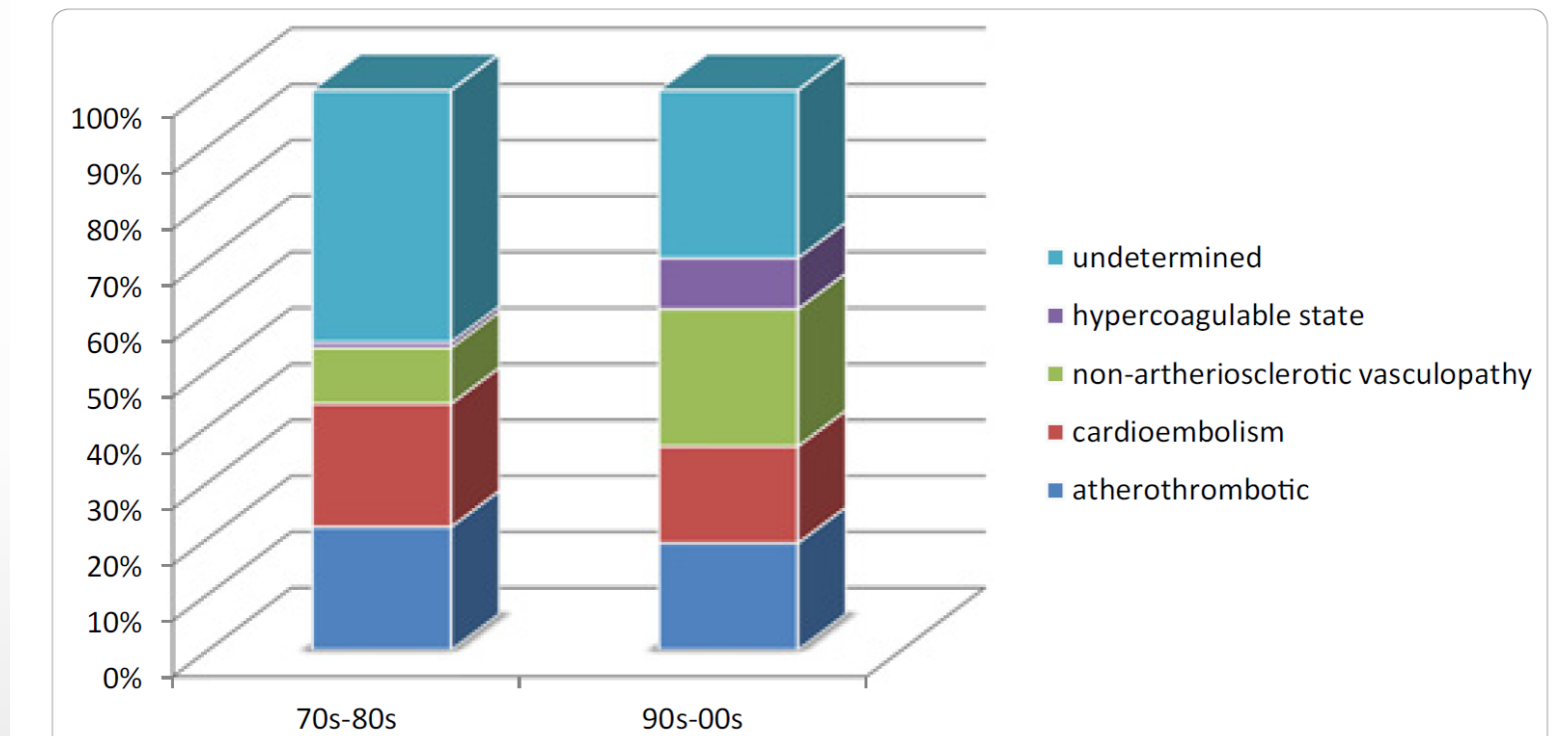
Narkotinių medžiagų vartojimo augimas

Substance Use by Age In Stroke Patients Across Study Periods

Age (years)	Current smoker			Street drug abuse		
	1993-94	1999	2005	1993-94	1999	2005
18 - 35	15 (38%)	17 (44%)	17 (36%)	5 (12%)	6 (15%)	13 (28%)
35-44	26 (41%)	45 (48%)	66 (55%)	2 (3%)	15 (16%)	24 (20%)*
45-54	88 (43%)	125 (47%)	162 (53%)	6 (2%)	18 (7%)	59 (19%)**

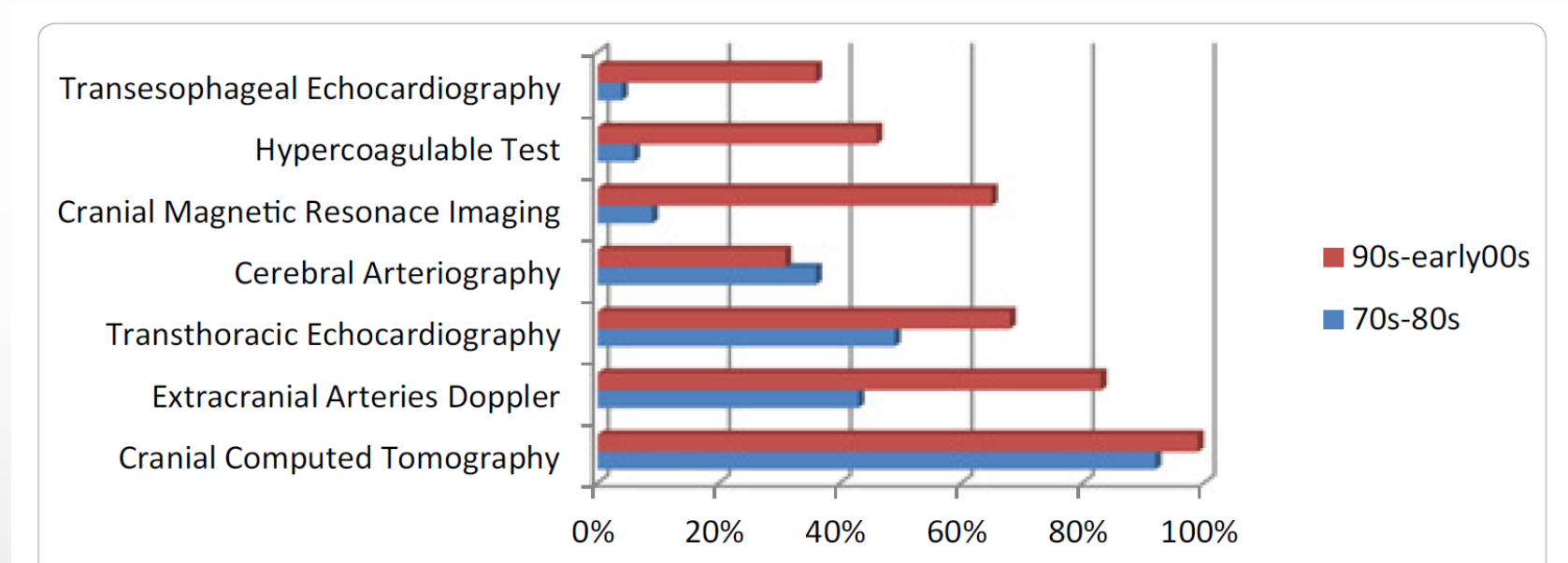
Rosa F, et al. Trends in substance abuse preceding stroke among young adults: a population-based study. *Stroke* 2012 ; 43: 3179-83.

Kriptogeninis insultas: dažnio kitimo tendencijos



Varona J. Diagnostic work-up and etiology in ischemic stroke in young adults" before and now. *J Neurol Neuropsychol* 2012; 3: 1-4

Kriptogeninis insultas: ištyrimo gausėjimas



Varona J. Diagnostic work-up and etiology in ischemic stroke in young adults" before and now. *J Neurol Neuropsychol* 2012; 3: 1-4

Accuracy of Transcranial Doppler for the Diagnosis of Intracardiac Right-to-Left Shunt

A Bivariate Meta-Analysis of Prospective Studies

kTKD yra geriausias tyrimo
metodas, skirtas pradiniam šunto
nustatymui klinikiniam darbe ir
epidemiologiniuose tyrimuose
= atrankos tyrimas

ncijuoti

kTKD vs TEE 97% jautrumas > specifiškumas
intrakardinius nuostatus

TEE vs kateterizacija

TCD vs kateterizacija 98% jautrumas, 94% specifiškumas

TEE (–) brangu, ilgai trunka, nepatogu ligoniui, VM dažniausiai nėra pakankamas

EKG / 24 val. Holter monitoravimas / >24 val. / kiti PV paieškos būdai

Type of monitoring	Setting	Invasive vs. noninvasive	Duration	Rate of detection of atrial fibrillation, % <small>20,21,23,27,28</small>
Admission ECG	Inpatient	Noninvasive	N/A	2.7
Inpatient continuous telemetry	Inpatient	Noninvasive	3-5 d	5.5-7.6
Holter monitor	Outpatient	Noninvasive	24 h	3.2-4.8
			48 h	6.4
			7 d	12.5
Mobile continuous outpatient telemetry	Outpatient	Noninvasive	21-30 d	16-25
Implantable loop recorders	Outpatient	Invasive	6 mo	9
			36 mo	30

Understanding diagnosis and treatment of cryptogenic stroke. AHA. ASA healthcare professional guide diagnosis, treatment, case studies. 2015

Diagnosticinis našumas

JAV 2005-10 m. universitetinės ligoninės insulto skyrius N215

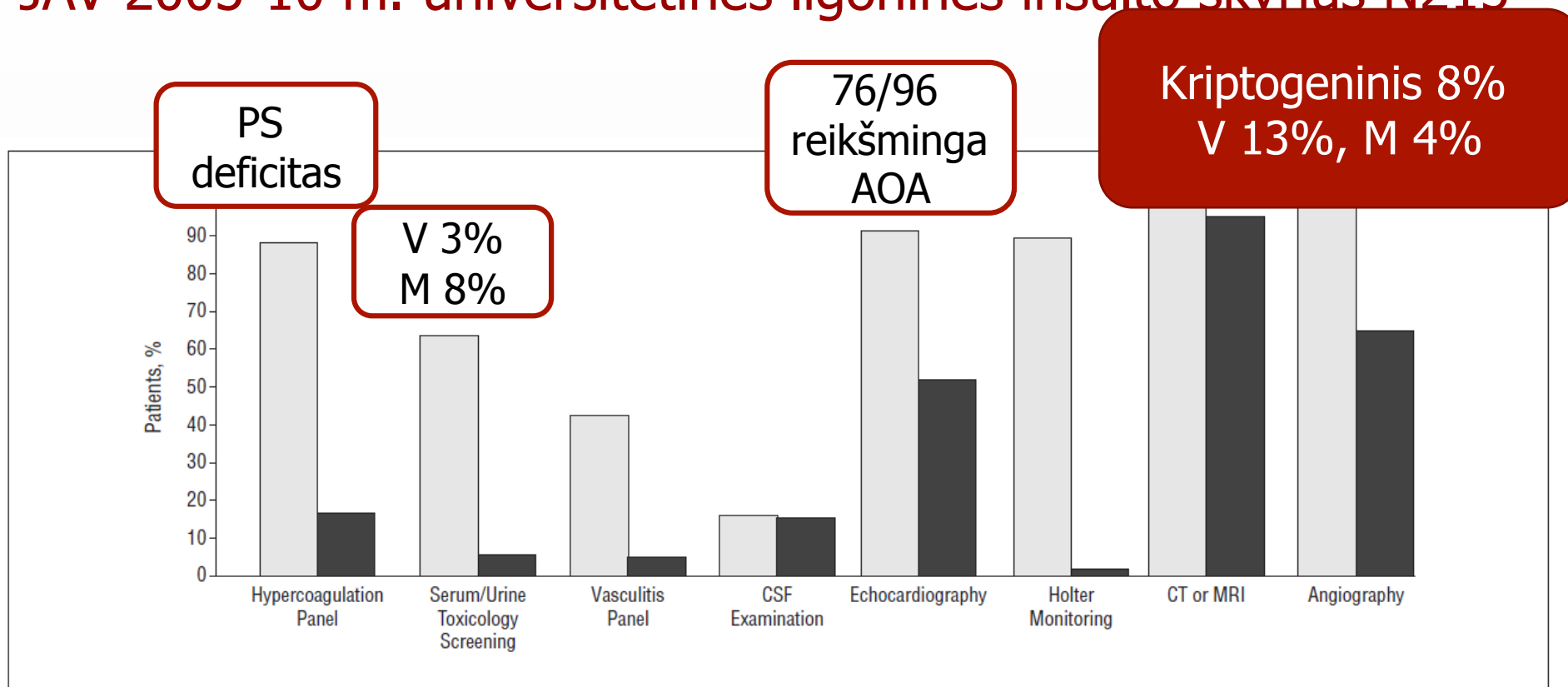
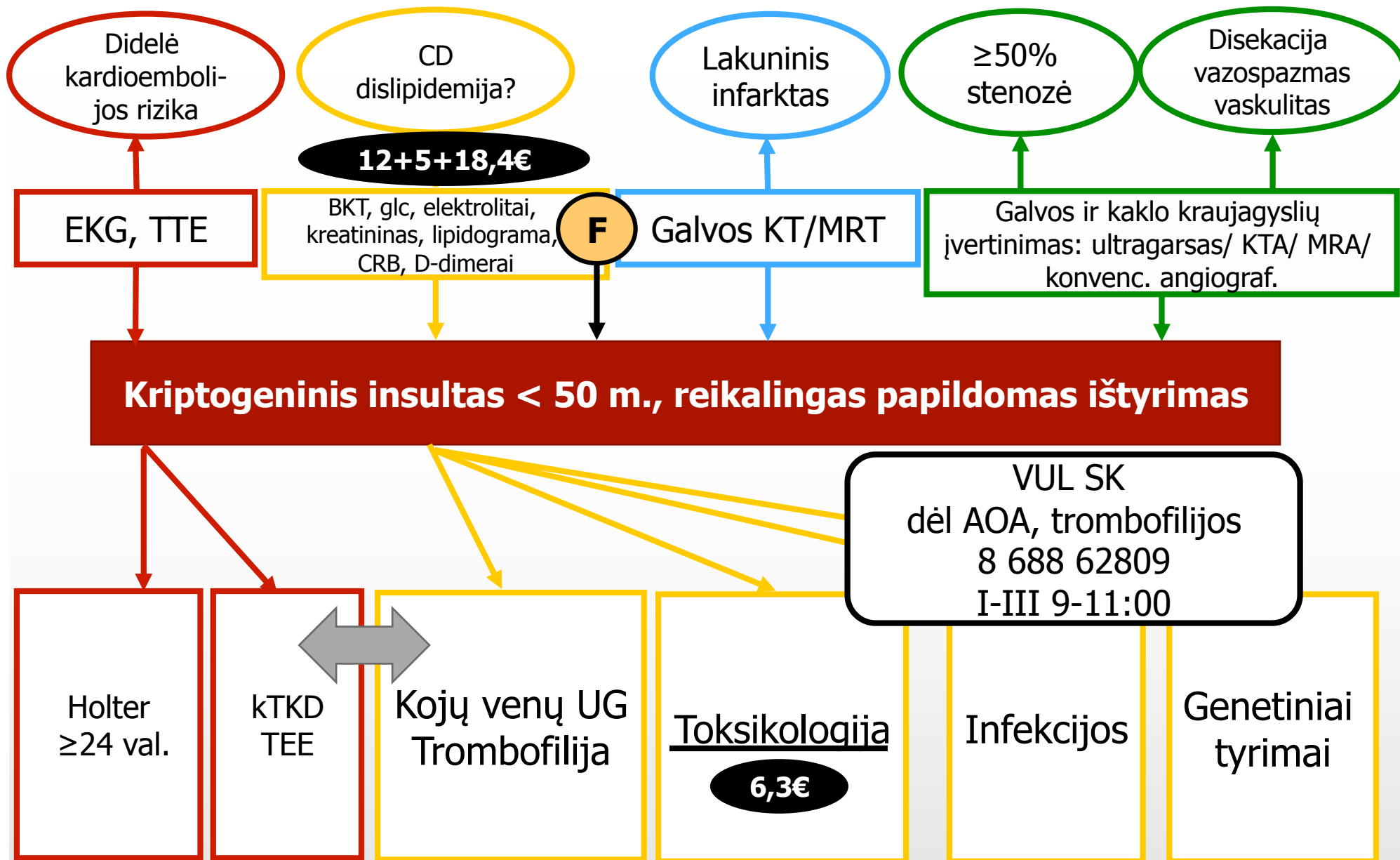


Figure. Diagnostic tests in young adults with ischemic stroke. The lighter bars show the percentage of patients who underwent a certain test and the black bars show the percentage of tests showing a positive result relative to stroke etiology (ie, diagnostic yield). CSF indicates cerebrospinal fluid; CT, computed tomography; MRI, magnetic resonance imaging. See “Methods” section for individual tests included under each panel.

Ji R, et al. Ischemic stroke and transient ischemic attack in young adults: risk factors, diagnostic yield, neuroimaging, and trombolysis. JAMA Neurol. 2013; 70: 51-57.



Hart R, et al. Embolic strokes of undetermined source: the case for a new clinical construct. *Lancet Neurol* 2014; 13: 429-38. Understanding diagnosis and treatment of cryptogenic stroke. AHA. ASA healthcare professional guide diagnosis, treatment, case studies. 2015. Finsterer J. Management of cryptogenic stroke. *Acta Neurol Belg* 2010; 110: 135-47. Ferro J, et al. Aetiological diagnosis of ischaemic stroke in young adults. *Lancet neurol* 2010; 9: 1085-96. Mackey J. Evaluation and management of stroke in young adults. *Continuum* 2014; 20: 352-69.