Imitateurs et caméléons de l'AVC chez les jeunes et les très âgés

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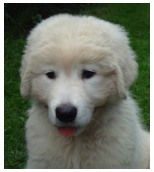
Outline

- Stroke mimics and chameleons
- Two exemplary cases
- General rules to differentiate them
- Mimics and chameleons in old and young patients

Stroke mimics and chameleons

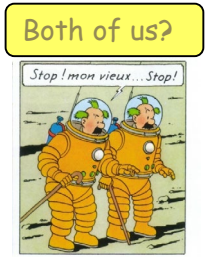


A. Stroke mimic : symptoms ...
- That look like stroke
- But are caused by another disease

Over-diagnosis of stroke (« imitator »)

B. Chameleon stroke : symptoms ...
- That look like some other disease
- But are caused by stroke

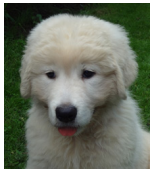
Under-diagnosis of stroke (missing strokes)



C. Simultaneous presence…
- of acute stroke and of
- another acute neurological condition

« Stroke plus syndrome »

Incidence of stroke mimics and chameleons

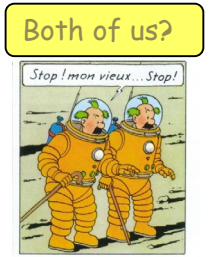


A. Stroke mimic :

- Prehospital / ambulance personnel 20-50 %
- Emergency room physician 10-20 %
- Neurologist 2-5 %

B. Chameleon stroke :

- Emergency room physician 2-5%?
- Neurologist 1-3%?



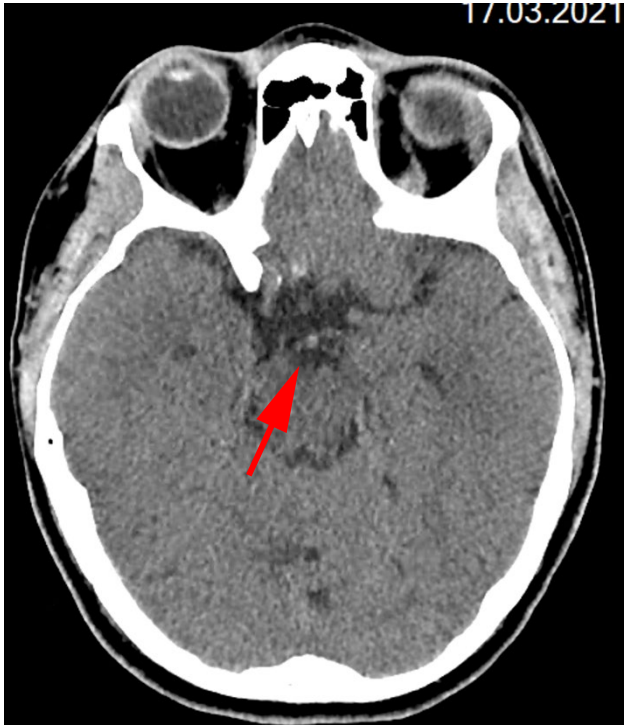
C. Simultaneous presence… ??

Mimics: Mazighi Curr Opin Neurol 2012; Oostema Stroke 2015; Chameleons: Richoz Neurology 2015

Example case 1- 34 year old woman

- Good health, no comorbidities
- While doing fitness acute onset of thunderclap headache and loss of consciousness
- GCS 6 according to paramedics, GCS 4 in peripheral stroke unit
- CT → CHUV

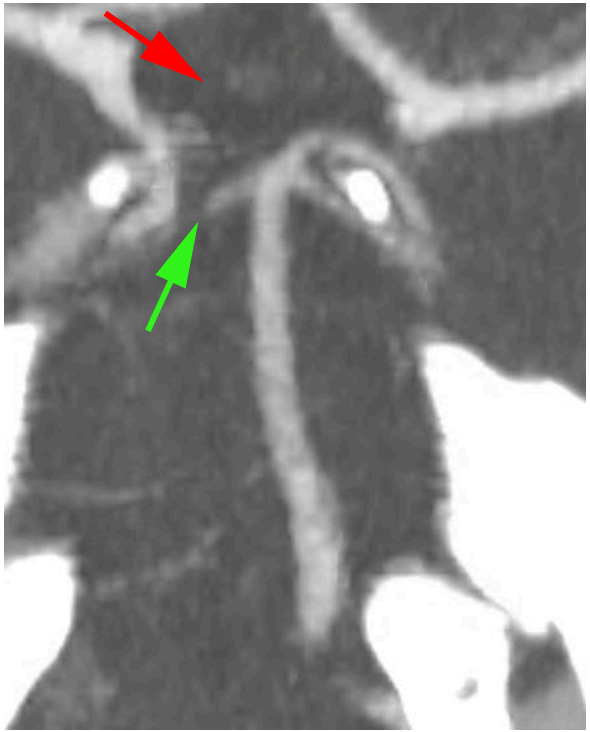
Brain CT

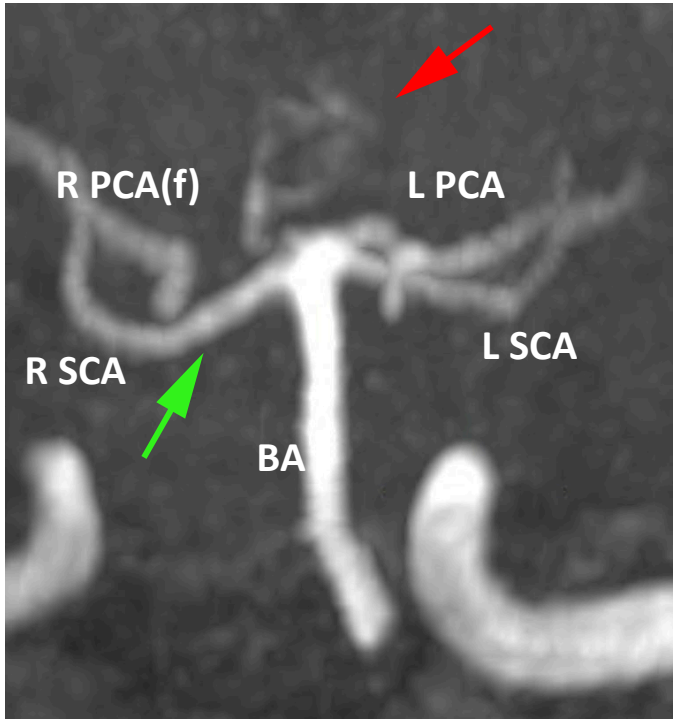


Transfert to CHUV

- Top of the basilar syndrome
- → IV thrombolysis at +2h from symptoms onset
- Admitted to ICU

Follow-up





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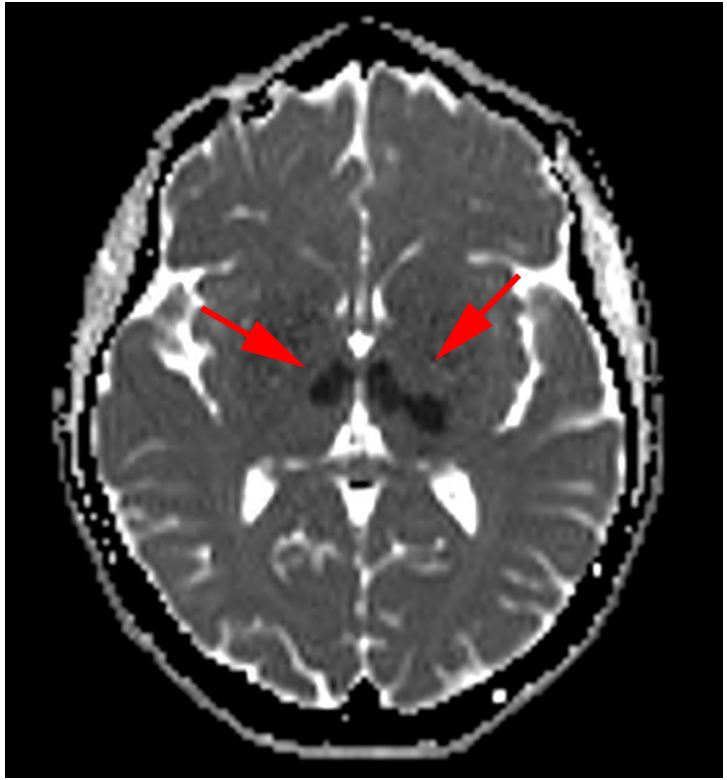
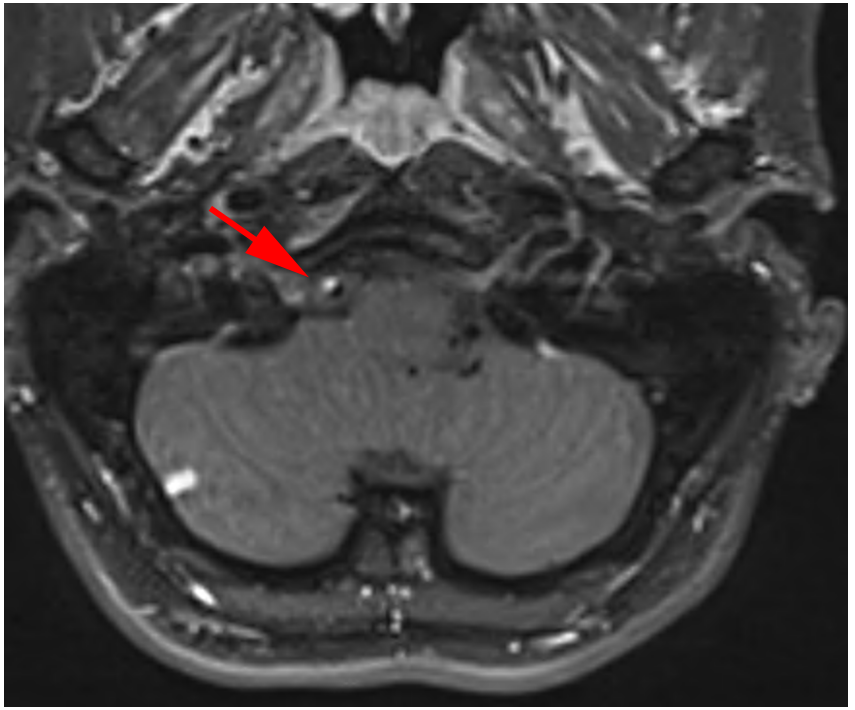


And the headache?



Example case 2 - 87 years old man

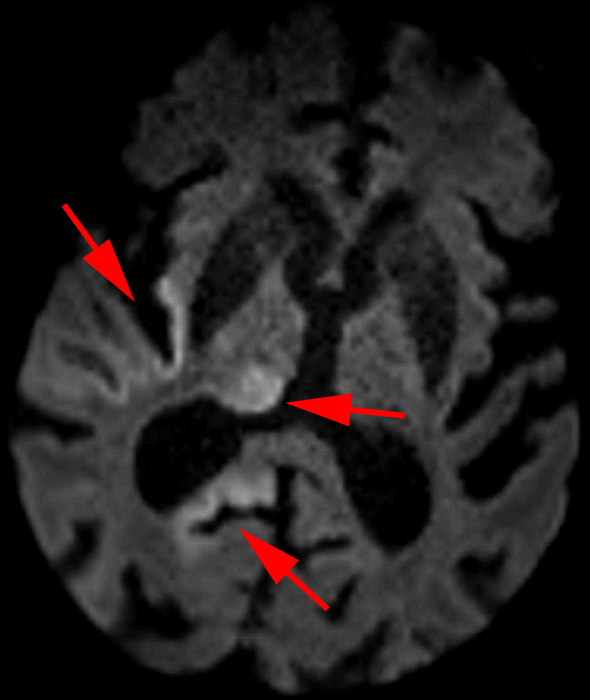
- Living alone, independent for daily activities, CMS help (to wear compression stokings in the morning)
- Known for:
  - arterial hypertension
  - atrial fibrillation anticoagulated by apixaban
  - smoking stopped (40 UPA)

Example case 2 - 87 year old man

- Found at 8h by CMS person with left hemiparesis and dysarthria (last seen well the morning before, but onset likely shortly before he was found)
- In the ER:
  - awake, oriented, no other speech deficit except dysarthria, left multimodal neglect
  - no visual field deficit
  - right-sided eyes deviation
  - left central facial palsy, left-sided severe hemiparesis

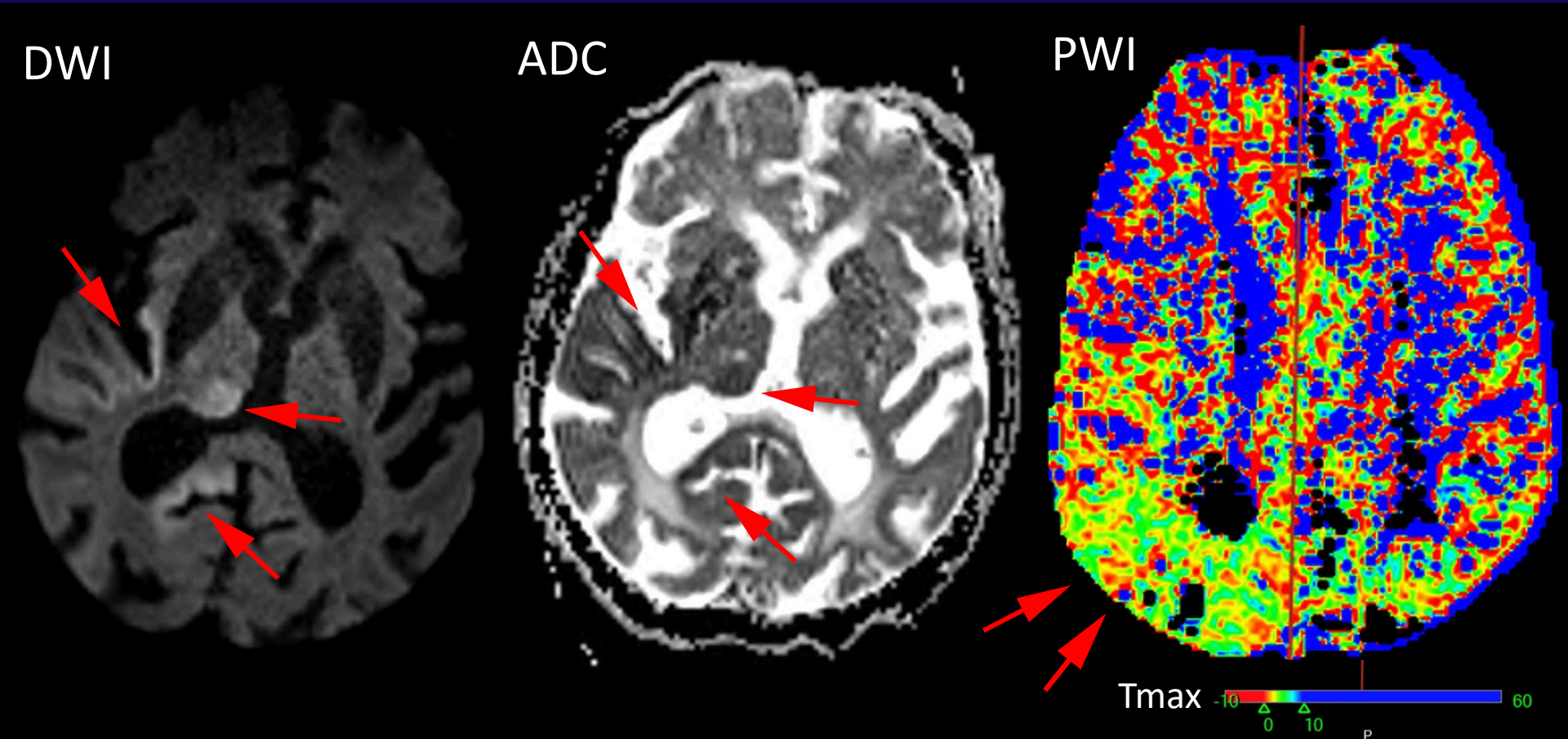
Acute MRI

DWI



ADC

Epilepsy: also a radiological mimic



HOW TO IDENTIFY MIMICS AND CHAMELEONS

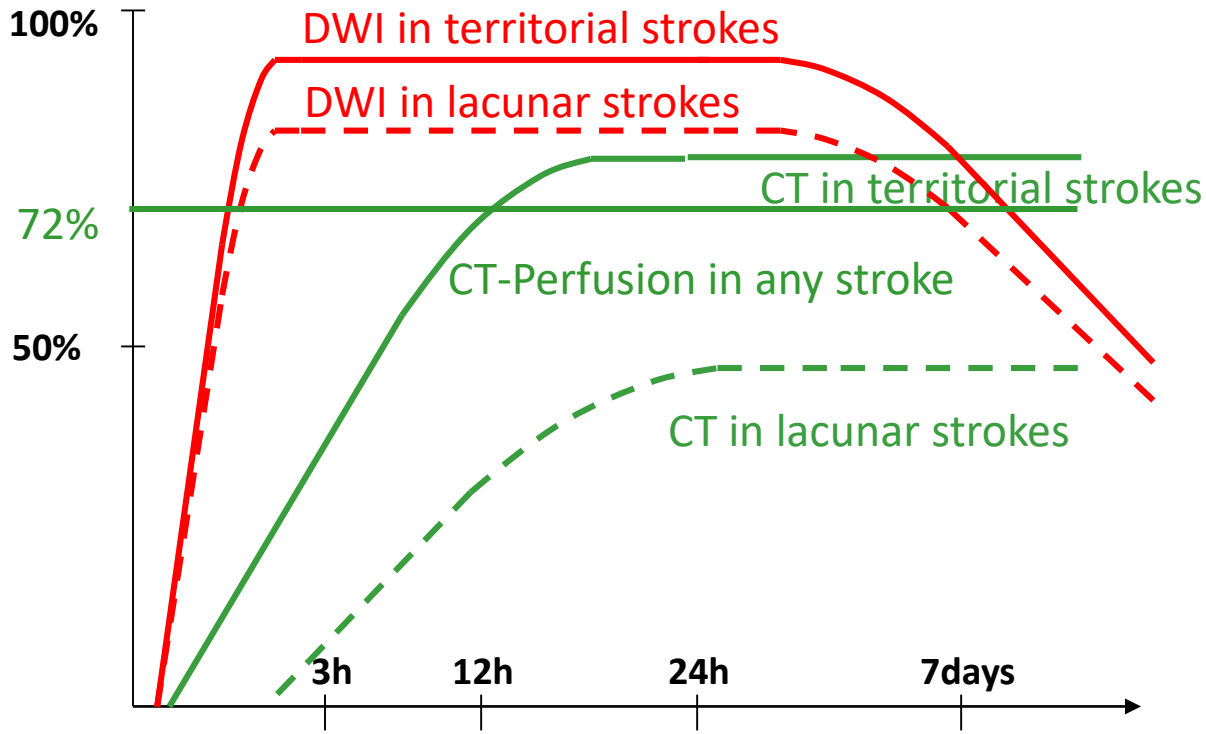
« Classical » stroke presentation

- Exact onset can be determined
- Definite history of focal neurological symptoms
  - Deficit attributable to right or left brain
  - Stroke localisation possible (anterior/posterior/lacunar)
- No previous cognitive impairment
- No abnormal findings in other systems

Hand et al. Stroke 2006

How to detect acute ischaemia ?

Sensitivity for acute ischemic stroke on **CT** and **MRI**



Shalala Lancet Neurology 2007; Lin CVD 2009; CTP: Bill Eur J Neurol 2016

How to detect acute ischaemia ?

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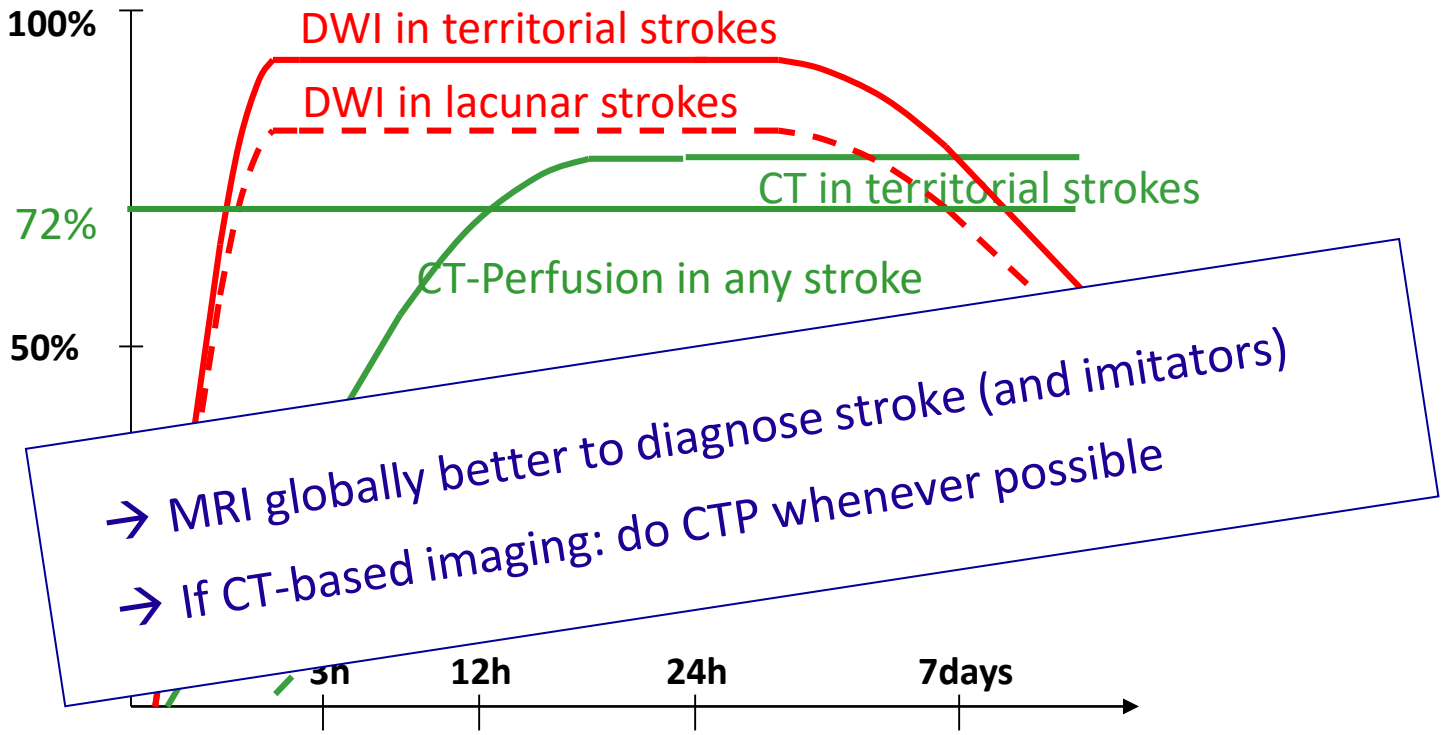
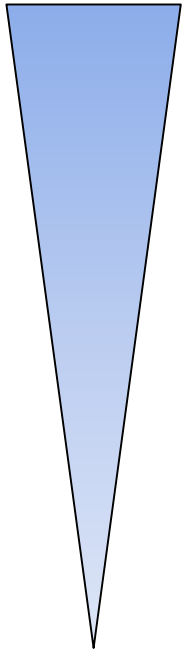


Shalala Lancet Neurology 2007; Lin CVD 2009; CTP: Bill Eur J Neurol 2016

Stroke mimics and chameleons

= The differential diagnosis of stroke & TIA

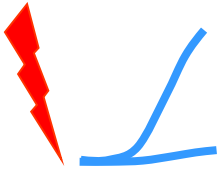


- Seizure (focal, or Todd's phenomenon)
- Migraine with aura
- Acute vertigo of peripheral or other origin
- Transient global amnesia
- (Pre-) Syncope / systemic hypotension, orthostatisme
- Psychiatric / conversion syndrome
- Other focal brain lesion (MS plaque, subdural, tumor...)
- Hypertensive encephalopathy / Posterior reversible leukoencephalopathy
- Meningitis / encephalitis
- Systemic metabolic and infectious causes, intoxications
  - Decompensation of old lesions
  - Confusional state
  - Stupor / coma

checklist

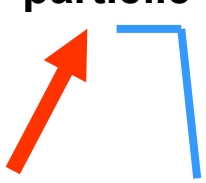
Caractéristiques cliniques des atteintes neurologiques aiguës / transitoires du CNS

AVC AIT



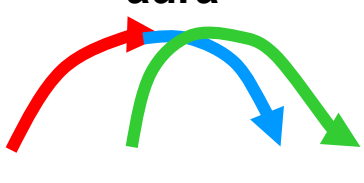
- Début aigu sur secondes
- Phénomènes négatifs (parésie, hyposensibilité, aphasie)
- Baisse vigilance rare
- Antécédents / FR vasculaires

Epilepsie partielle



- Progression sur sec.- 1min.
- Phénomènes positifs (clonies, paresthésies)
- Parfois perte de connaissance / amnésie
- Antécédents épilepsie, OH

Migraine + aura



- Progression sur 3-15 min.
- Phénomènes pos. ou négatifs
- Apparition 2° de céphalées
- Pas de baisse de vigilance
- Antécédents de migraines

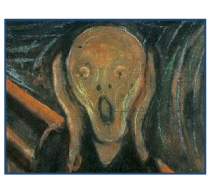
Lipothymie/ Syncope

- Progression sur sec.- 1min
- Symptômes lipothymiques généralisés
- Baisse vigilance
- Pas de signes focaux
- Ev. orthostatisme

Amnésie globale transit.

- Début rapide
- Amnésie profondes pour des données récentes
- Mémoire autobiogr. OK
- Pas de signes focaux
- 50% episode stressant avant

Malaise psychogène



- Début variable
- Absence de signes objectifs
- Non-concernement
- Démonstrati-vité à l'examen
- Antécédents psychiatriques et psycho-sociaux

Autres : hypoglycémie, poussée SEP, état confusionnel.

P.Michel, Neurologie 2019

Stroke mimics: *really a major issue in practice?*

Patients with stroke mimics:

- Will be assessed in emergency, which will often be useful, because mimics are usually other neurological disorders needing an urgent management
- Are not likely to undergo mechanical thrombectomy because they have no large-vessel occlusion.
- May receive an inappropriate treatment with rt-PA, but in this case, they have a very small risk of thrombolysis complication
- Some risk of inappropriate use of available facilities

D Leys et al. Arq Neuropsiquiatr 2020

Stroke chameleons: *really a major issue in practice!*

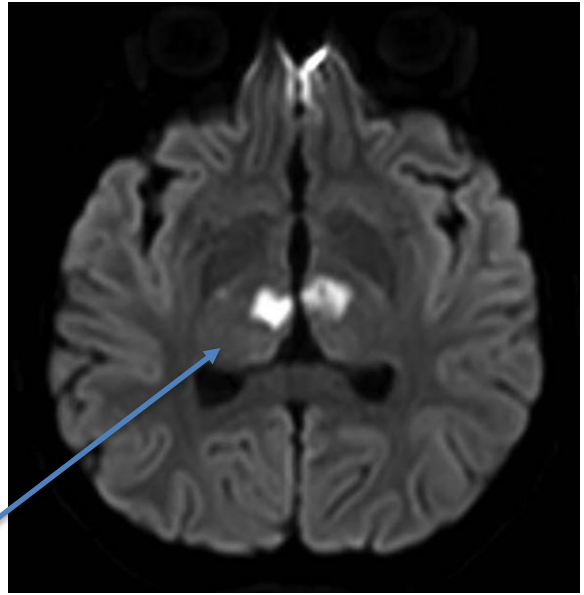
Patients with stroke chameleons:

- May present as acute peripheral vertigo, peripheral nerve palsy, seizure, movement disorders, acute behaviour disturbances
- But have undiagnosed strokes that may be disabling
- Risk of under-treatment :
  - identified with delay and may not receive necessary reperfusion therapies
  - not identified at all and do not benefit from secondary prevention measures

D Leys et al. Arq Neuropsiquiatr 2020

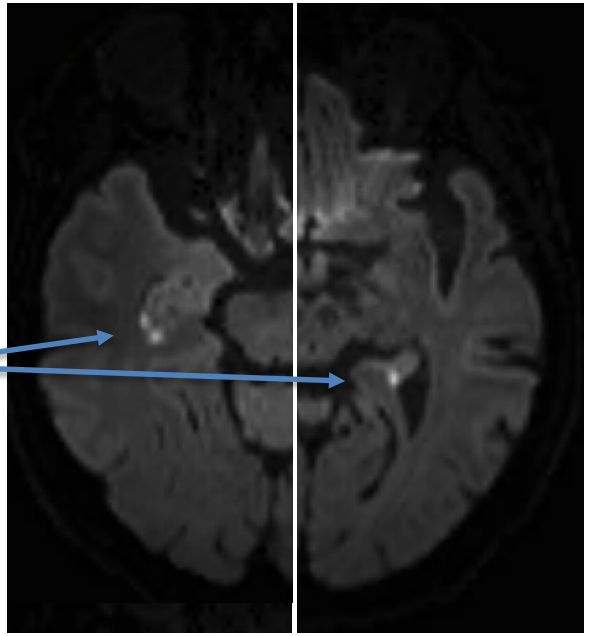
Stroke chameleons: stroke presentations frequently misinterpreted - 1

Clinical presentation	Wrong diagnosis	Localisation of stroke
Vertigo and ataxia, with/without nystagmus	Peripheral vertigo BPPV Gastroenteritis «Spell/malaise»	Cerebellar or lower brainstem stroke (Wallenberg)
Decreased level of consciousness	Metabolic coma Intoxication Epileptic seizure	Bi-thalamic, midbrain (“top of the basilar syndrome”)
Single extremity paresis (face, arm, leg)	Radial palsy Plexopathy	Frontal juxta-(cortical)



Stroke chameleons: stroke presentations frequently misinterpreted - 2

Clinical presentation	Wrong diagnosis	Localisation of stroke
Aphasia, apraxia	Confusional state Psychogenic	Left MCA
Amnesia	Transient global aphasia. Psychogenic Confusional state	Anterior thalamus, anterior ACA, other
Confusional state	Metabolic confusional state	Thalamus, right MCA/PCA
Behavioral change, abulia	Depression Psychogenic	ACA, head of caudate, thalamus



Stroke chameleons: risk factors, circumstances, and outcomes

Multivariate analysis comparing stroke-chameleons vs. strokes

	OR (95% CI)	*p* Value	Stroke-chameleons
Age (for 1-y increase above 18 y)	0.98 (0.96–0.99)	<0.01	Younger
Pretreatment with hypolipidemic drugs	0.29 (0.09–0.97)	0.04	Less statins
NIHSS score on admission (for 1-point increase)	0.99 (0.96–1.04)	0.99	Lower NIHSS
Eye deviation	0.21 (0.05–0.94)	0.04	Less eye deviation
Diastolic blood pressure	0.98 (0.96–0.99)	0.04	Lower BP
Cerebellar stroke	3.78 (1.87–7.63)	<0.01	More cerebellar strokes

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Richoz et al. Neurology 2015

Stroke chameleons: risk factors, circumstances, and outcomes

Patterns in the diagnostic process leading to missing acute ischemic strokes

Pattern	No. (%)
Stroke symptoms attributed to another disease[a]	38 (80.8)
Attributed to another neurologic disease[a]	20 (42.6)
Attributed to nonneurologic disease[a]	8 (17.0)
Unexplained decreased level of consciousness	10 (21.3)
Stroke symptoms attributed to a concomitantly present condition[b]	9 (19.1)
Attributed to concomitant neurologic condition[b]	5 (10.6)
Attributed to concomitant psychiatric condition[b]	4 (8.5)

Richoz et al. Neurology 2015

Stroke chameleons: risk factors, circumstances, and outcomes

	AIS-C	AIS	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
No. of patients	47	2,153	—	—
Favorable outcome	23 (50.0)	1,273 (61.6)	0.62 (0.35-1.12)	0.21 (0.09-0.46)
Mortality	14 (30.4)	402 (19.4)	1.81 (0.95-3.43)	4.37 (1.81-10.54)
Recurrent ischemic cerebrovascular event	6 (13.3)	195 (9.9)	1.40 (0.59-3.35)	1.68 (0.68-4.12)

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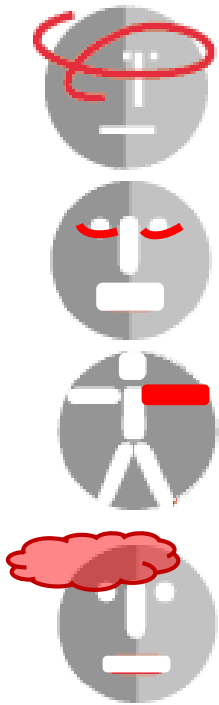
Richoz et al. Neurology 2015

Avoid stroke chameleons

Think « stroke » if acute appearance of ...



Isolated vertigo

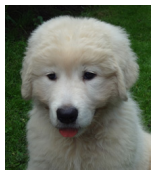
Coma / decreased level of consciousness

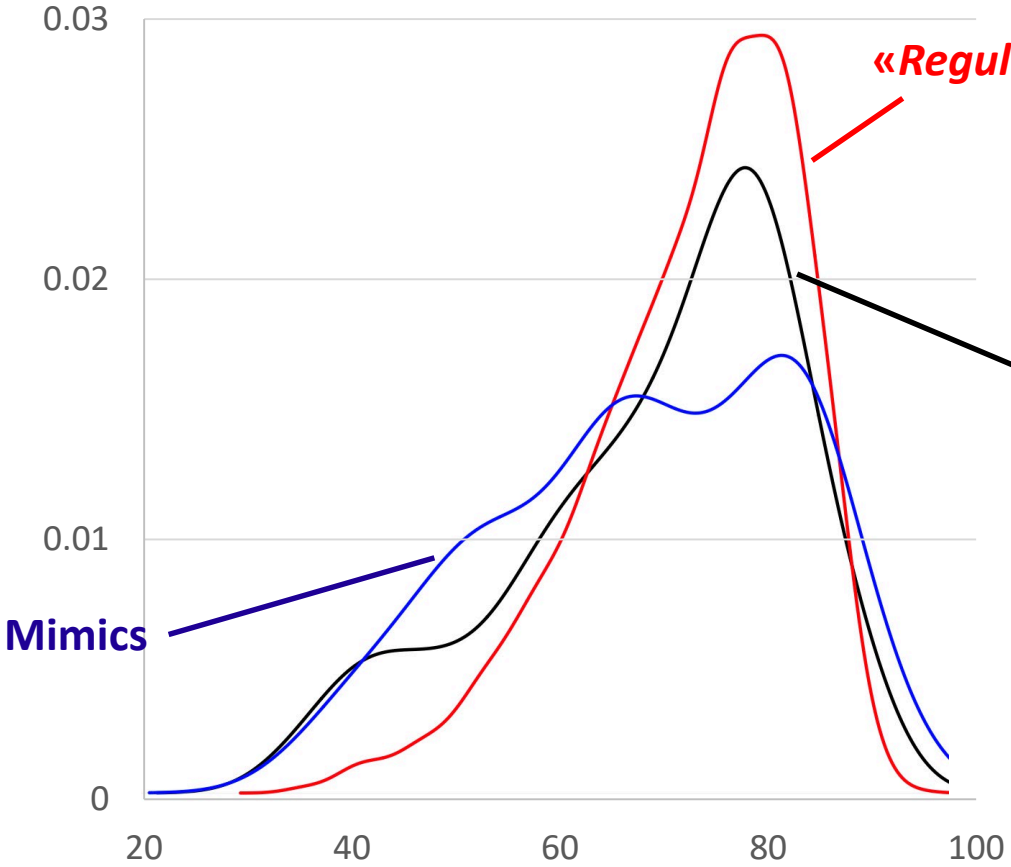
Monoparesis

Confusion / amnesia/ behavioural problem

MIMICS AND CHAMELEONS IN OLD AND YOUNG PATIENTS

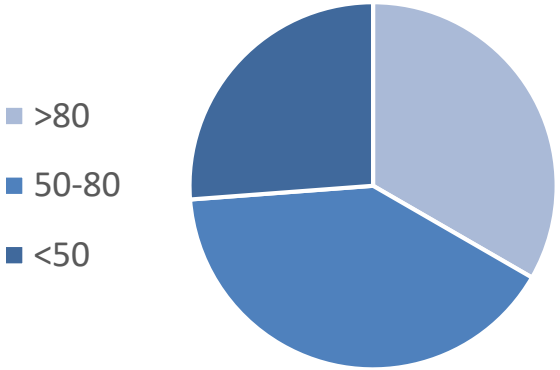
Age distribution in stroke, mimics and chameleons

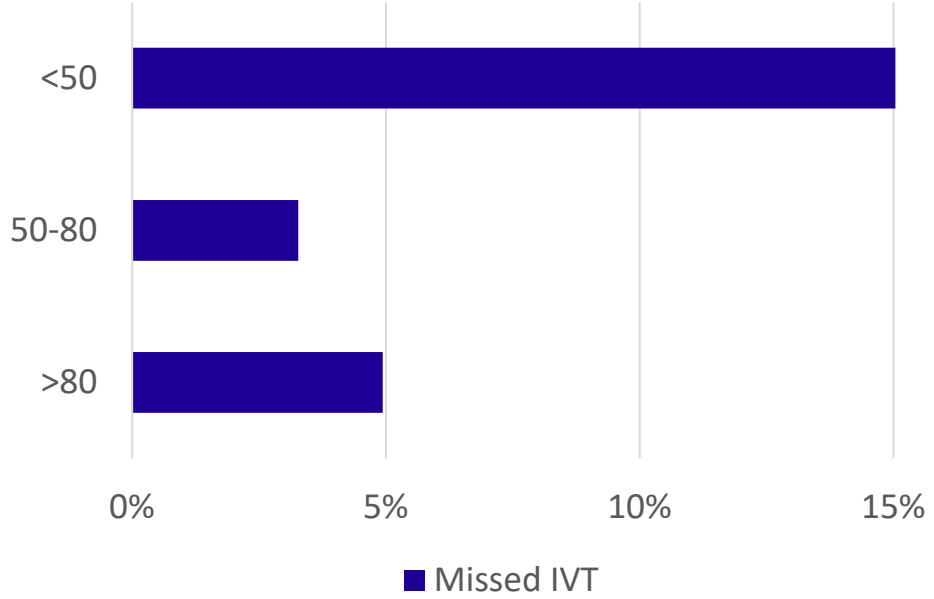




Mimics by age: the numbers

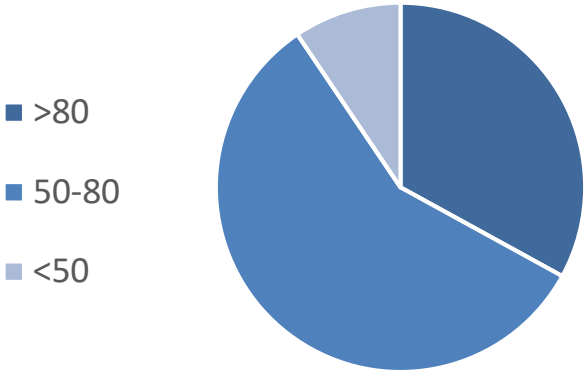
		All standard TIV	
		Mimics	Strokes
Age	<50	22	122
	50-80	34	1005
	>80	28	539

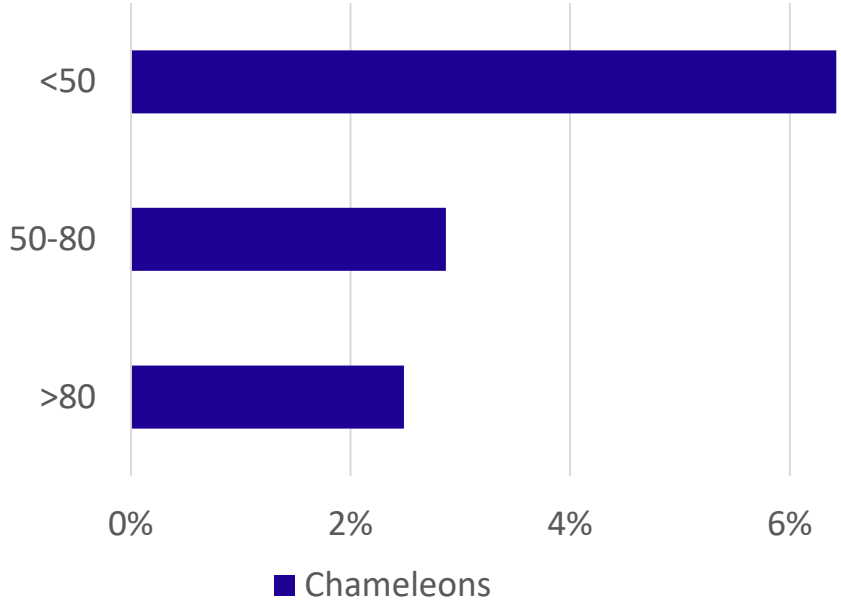




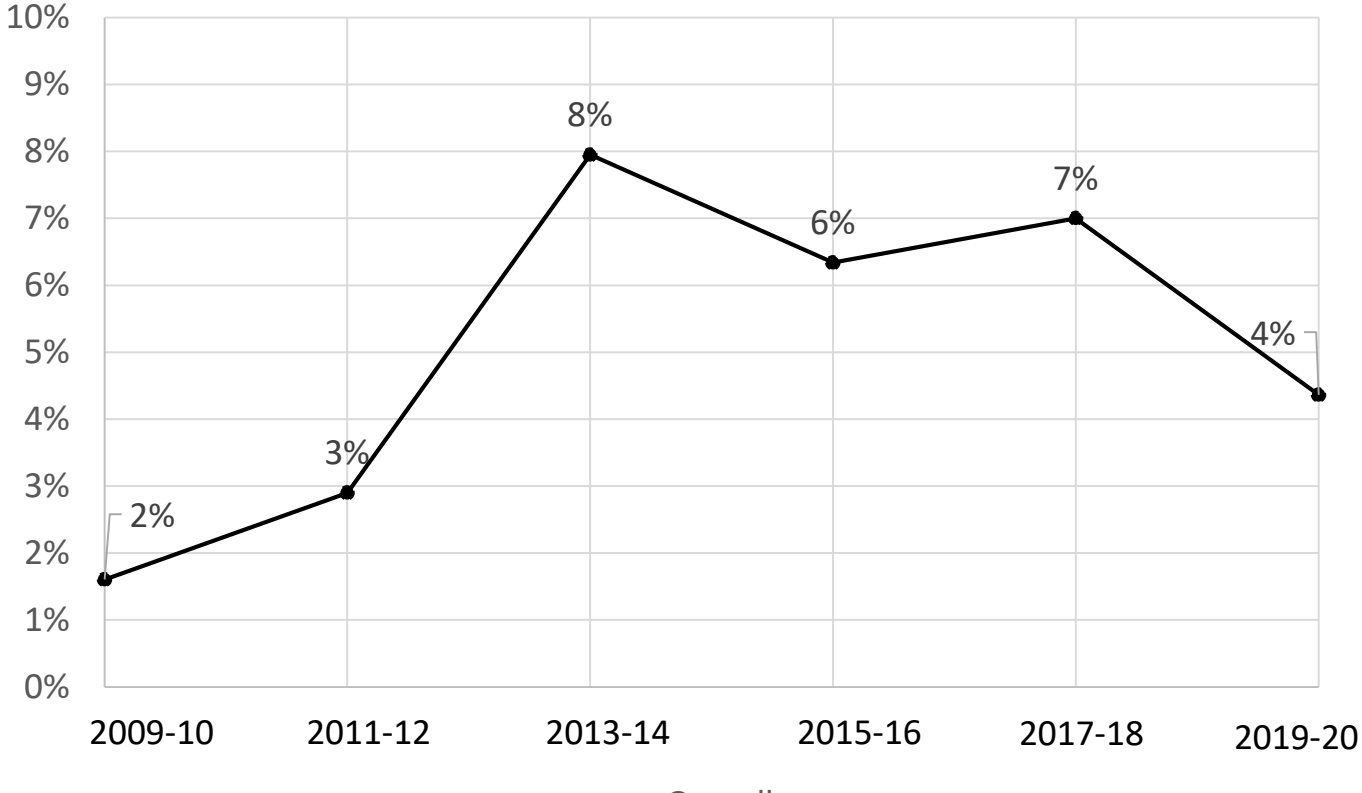
Chameleons by age: the numbers

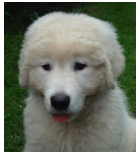
		All ischemic stroke	
		Chameleons	Strokes
Age	<50	37	539
	50-80	97	3286
	>80	48	1883



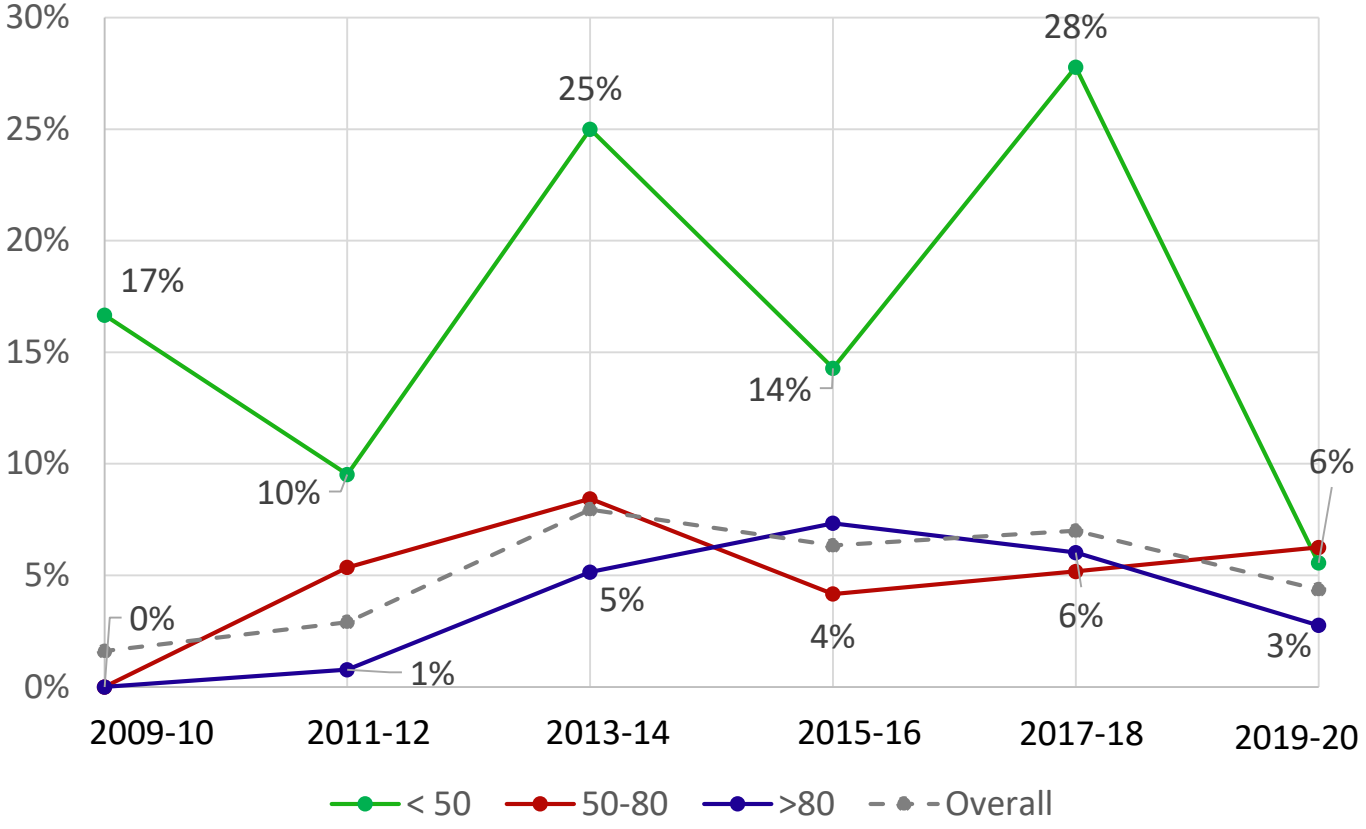


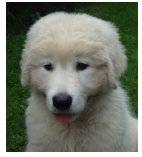
Lysed mimics over the years





Lysed mimics over the years by age groups





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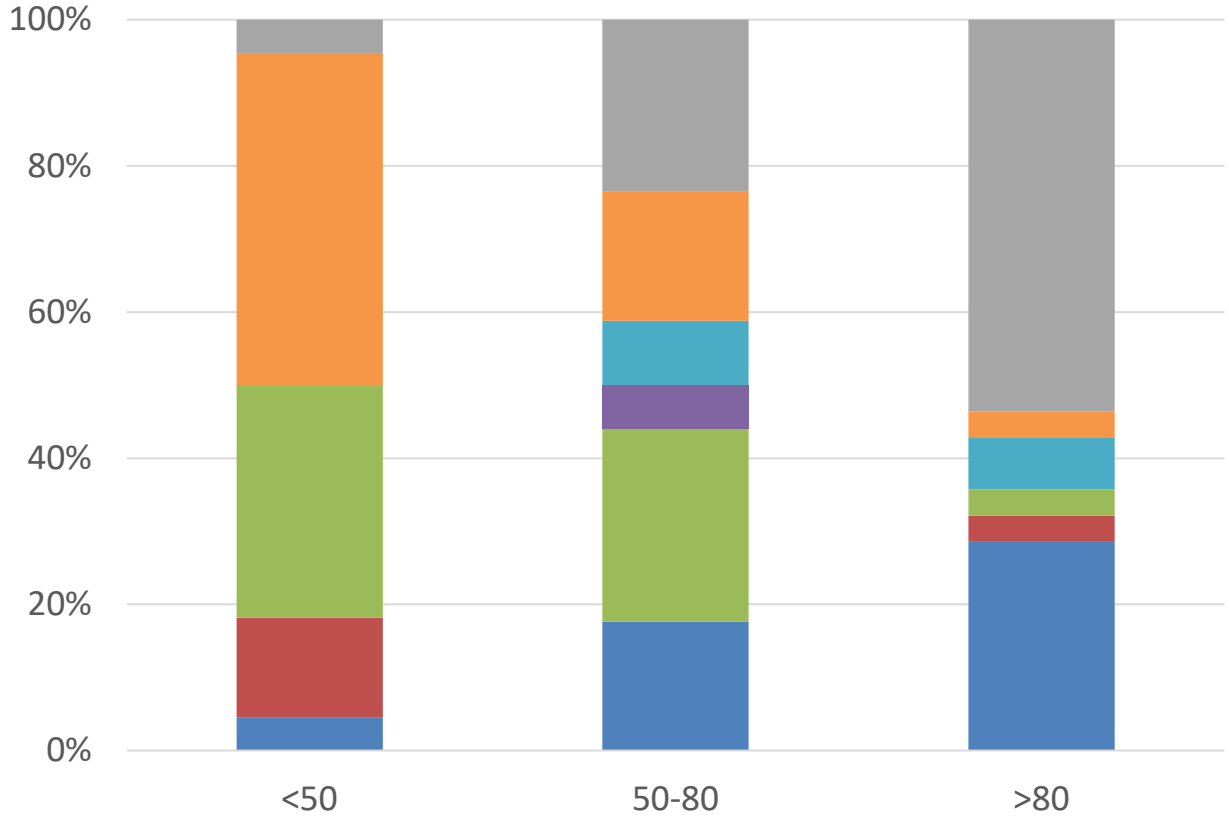
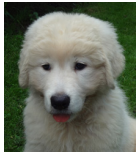
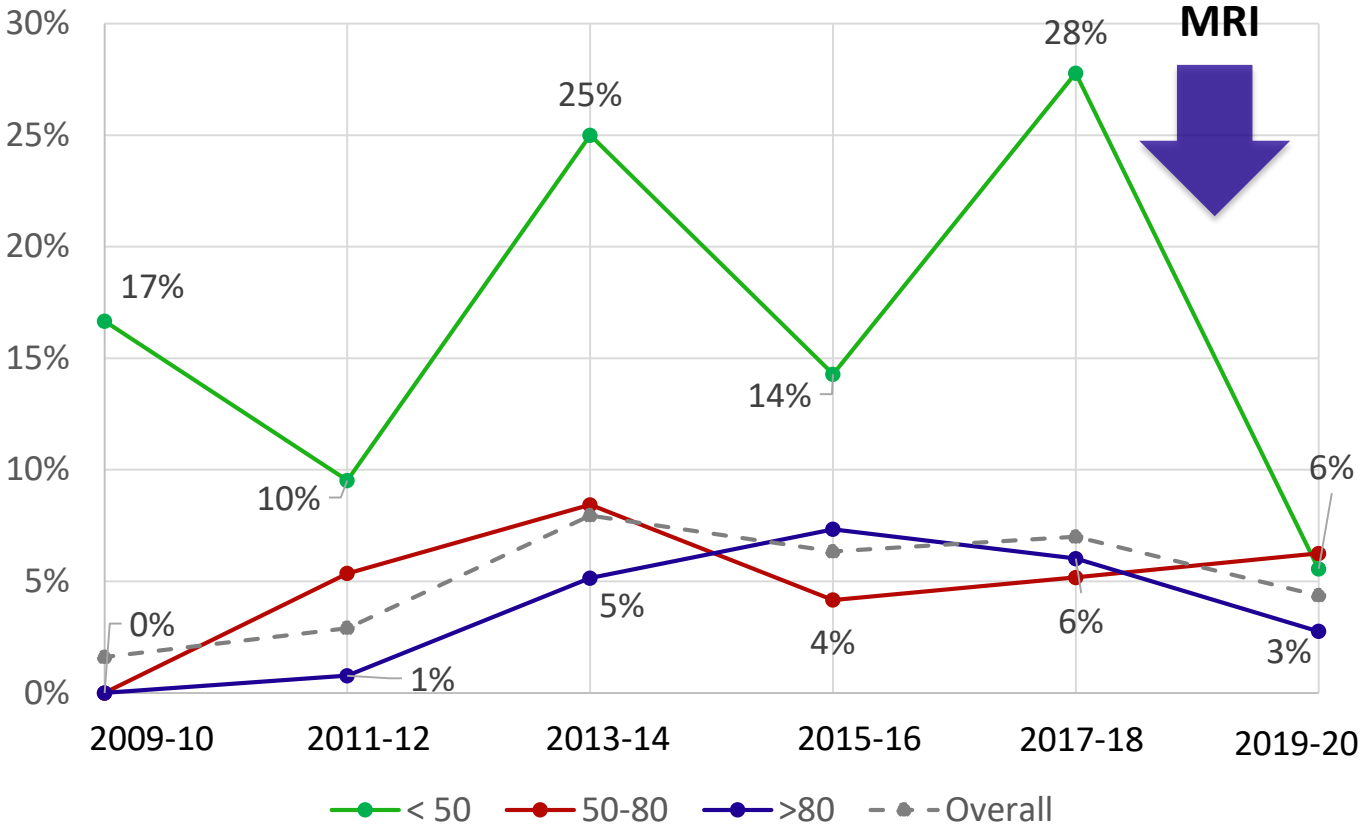
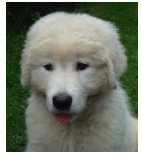
Mimics diagnosis according to age





Lysed mimics by age groups: MRI effect?





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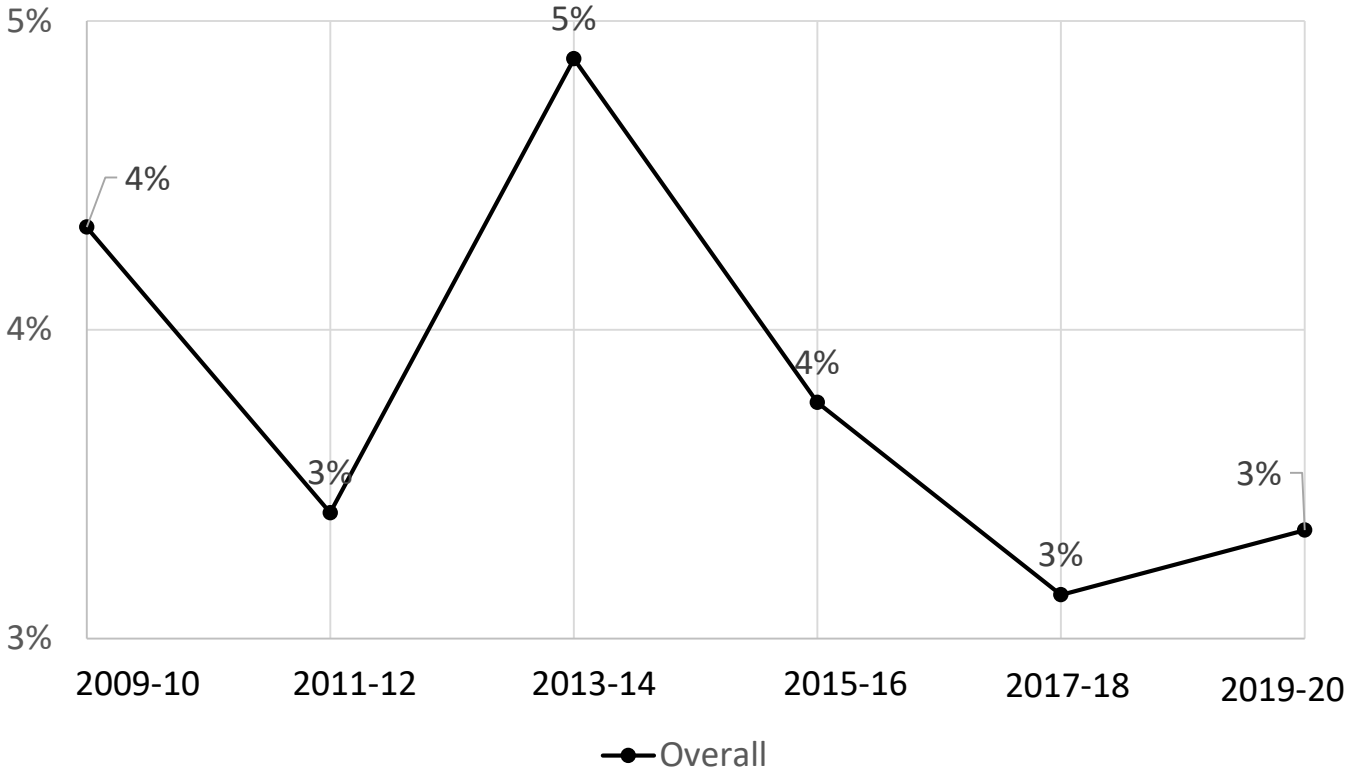
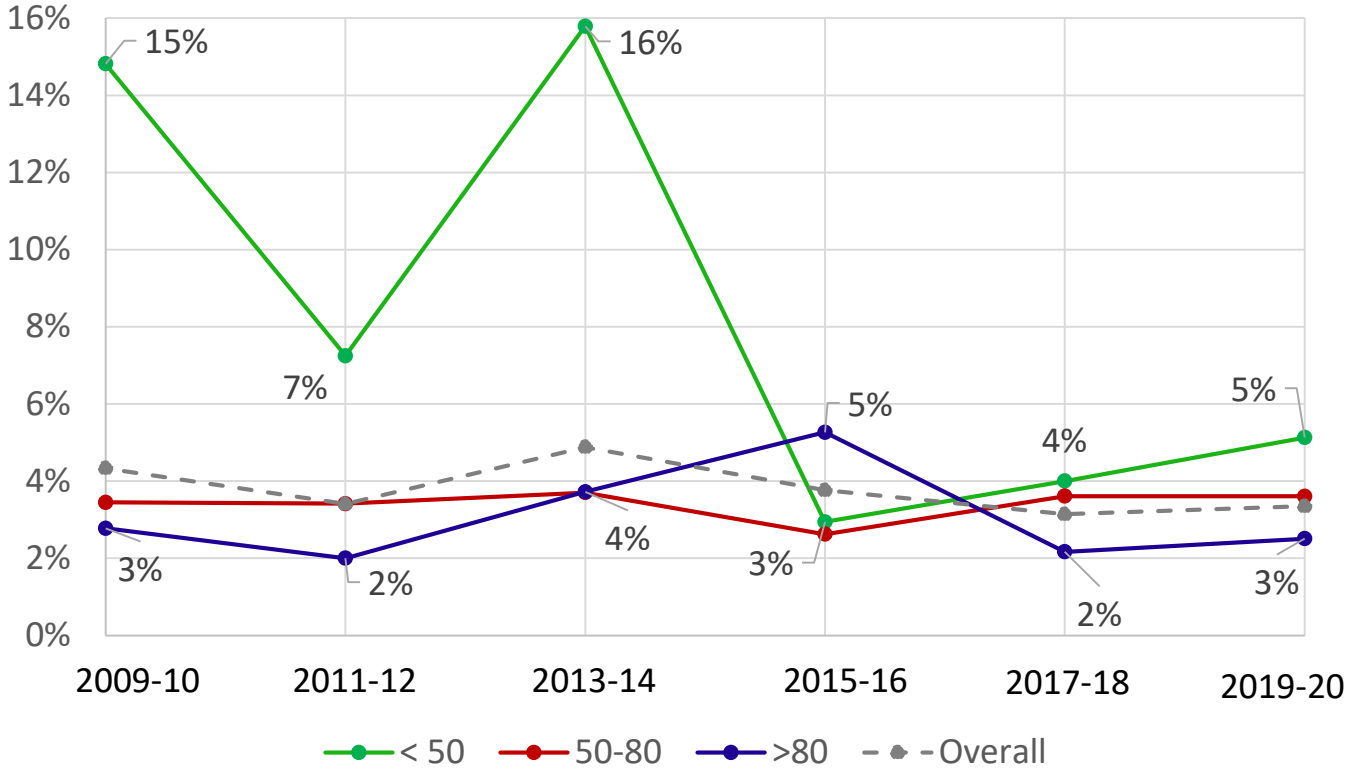
Chameleons over the years



Chameleons over the years by age groups



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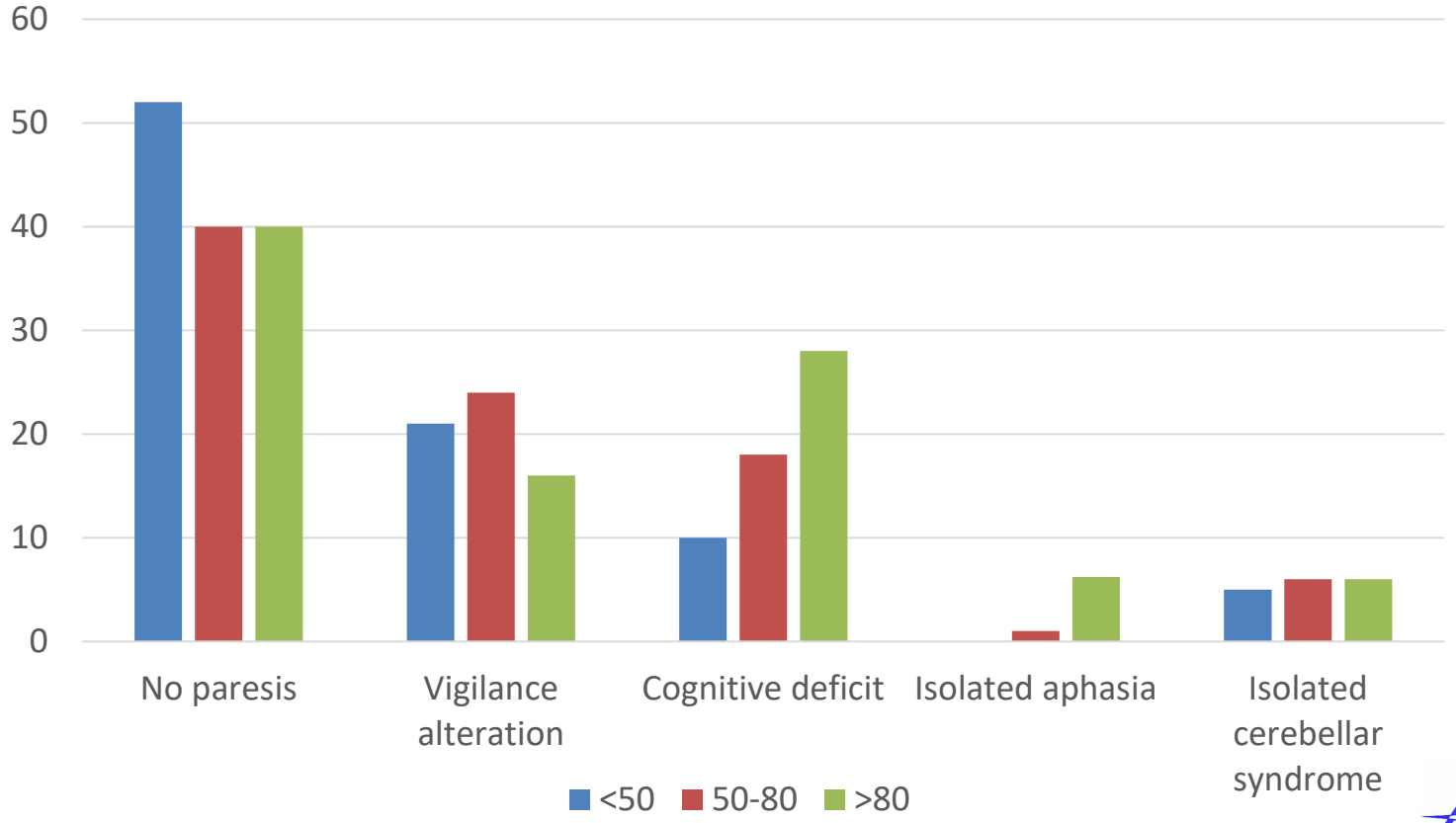
Symptoms of stroke chameleons according to age



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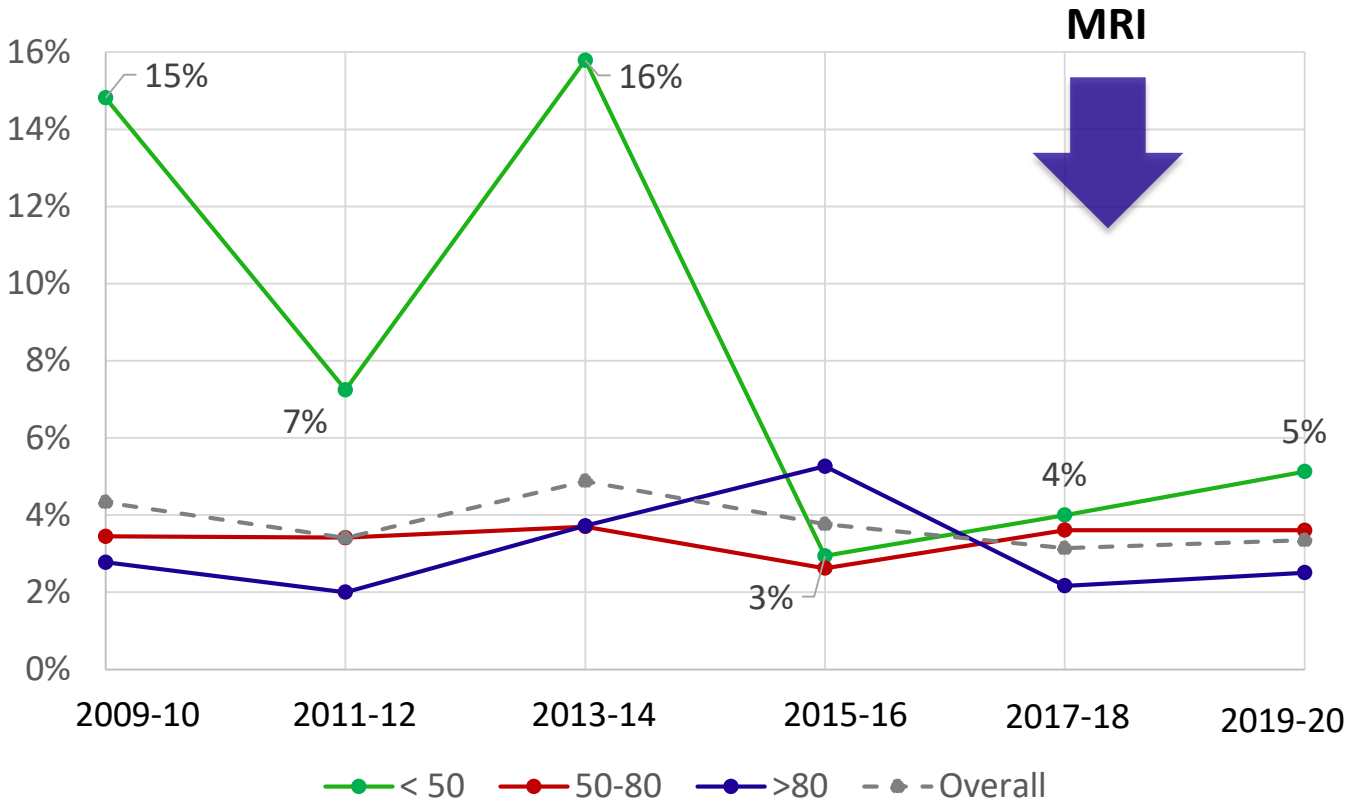
Chameleons by age groups: ~~MRI effect~~



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Stroke mimics and chameleons: *conclusion*

- Suspicion of stroke/TIA: make a differential diagnosis (= keep an open mind)
- Avoid mimics over-treatment
  - Know clinical presentation of mimics (migraine, seizure ...)
  - Careful history, witnesses
- Avoid chameleon strokes and under-treatment
  - Know usual and unusual stroke presentations
  - Think of stroke if vertigo with red flags, sudden unexplained coma, sudden cognitive changes, even in young patient
- Select appropriate imaging, and look at it carefully

Mimics and chameleons in young and old patients

- Stroke mimics: be attentive to →
  - In young: migraine and psychogenic
  - In old: seizuers encephalopathies
- Stroke chameleons: be attentive to →
  - In young: absence of paresis, vigilance alterations
  - In old: isolated aphasia, new cognitive deficits
  - In everybody: cerebellar symptoms

MERCI POUR L’ATTENTION!