

March 2019



**NORTHWEST
COMMUNITY
EMERGENCY
MEDICAL
SERVICES
SYSTEM**

Continuing Education

Stroke



**Questions and comments are welcome and should be directed to
Jen Dyer, RN, BS, EMT-P, EMS Educator**



Goal: Strengthen participants' ability to assess and recognize strokes and provide appropriate patient care and disposition based on evidence-based stroke management guidelines.

OBJECTIVES:

Upon completion of the assigned readings, class and study questions, each participant will do the following with at least an 80% degree of accuracy and no critical errors:

1. Sequence the impact of disrupted cerebral blood flow and how the brain becomes injured in stroke explaining the importance of salvaging the penumbra.
2. Discuss each link in the stroke chain of survival and explain why these pts are time sensitive.
3. Identify and provide rationale for the EMS resources that must be prepared to identify and/or treat stroke.
4. Explain the five goals of stroke management..
5. Explain the diagnostic importance of information to be obtained in a SAMPLE history for stroke.
6. Discuss the indications, timing, and preferred sites for vascular access and IVFs in pts with stroke.
7. Describe preferred positioning and environmental controls to protect a pt with stroke.
8. Compare and contrast the components, of the Cincinnati Prehospital Stroke Scale (CPSS) and the BEFAST exam.
9. Explain and sequence the components of a complete pt assessment for stroke.
10. Identify diseases/conditions that must be considered in the differential diagnosis of stroke.
11. Recognize alternate S&S of stroke that may be present with or without alterations to the quick stroke scales or exams.
12. Determine the most appropriate receiving hospital using the draft SOP Stroke checklist tool.
13. Explain the elements to include when calling a stroke alert to the appropriate receiving stroke center

Please consult the NWC EMSS website for full editions of complementary and supporting documents for this topic.

March ECG Strip Review

1.



Rate	Regularity	QRS width
P waves present?	PR Interval	
Rhythm		

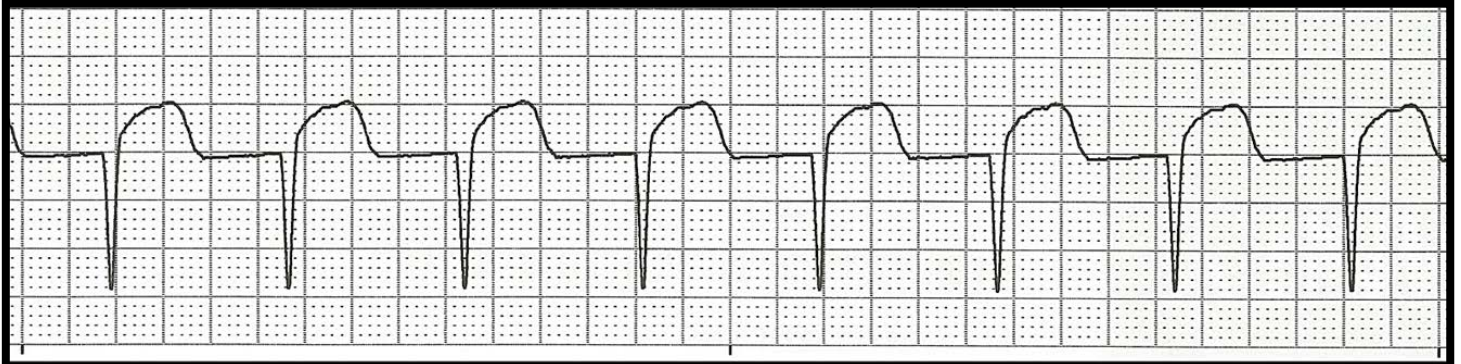
2.



Rate	Regularity	QRS width
P waves present?	PR Interval	
Rhythm		

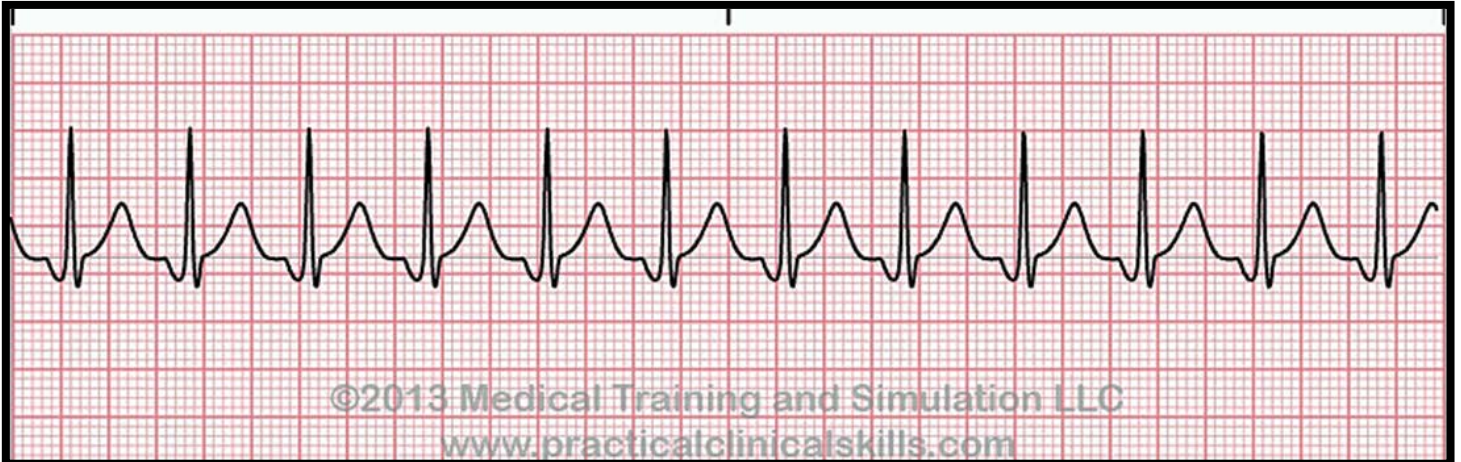
Stroke

3.



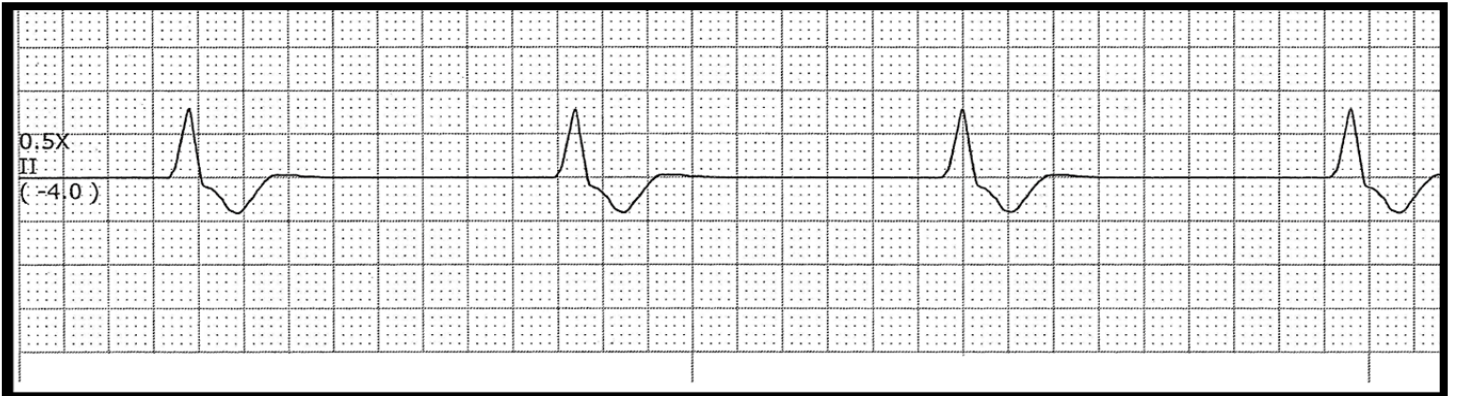
Rate	Regularity	QRS width
P waves present?	PR Interval	
Rhythm		

4.



Rate	Regularity	QRS width
P waves present?	PR Interval	
Rhythm		

5.



Rate	Regularity	QRS width
P waves present?	PR Interval	
Rhythm		

NWC EMSS STROKE Screen/ALERT DRAFT CHECKLIST 2019					
Pt. name			DOB		Gender
Witness name			Call back number:		
Chief complaint(s)					
Severe headache or seizure at onset?				Y	N
Head trauma at onset?				Y	N
EXAM – NEW ONSET - BE FAST Stroke Screen				✓ IF ABNORMAL	
B	BALANCE/Coord – finger to nose, rapid alternating movements, heel to shin; ataxia; vertigo			R	L
E	EYES: Vision changes: blurred, diplopia, loss of visual field; photophobia Eye position; ptosis; Horizontal gaze: gaze palsy or fixed deviation			R	L
F	FACE: Unilateral weakness; asymmetrical smile and/or eye closing (Can or cannot wrinkle both sides of forehead)			R	L
A	Motor – ARM (close eyes and; hold out both arms for 10 sec) Normal; Abnormal: drift to no effort against gravity			R	L
S	SPEECH (“You can’t teach an old dog new tricks” (expressive/receptive aphasia), dysarthria, word substitution or retrieval deficits				
T	TIME last known well (military clock): <input type="checkbox"/> ≤ 3.5 hrs <input type="checkbox"/> >3.5 hr				
Other assessments	Level of consciousness: GCS				
	Orientation: Answers to questions: Name, age, month of year				
	Responds to commands: open/close eyes, stick out tongue				
	Hearing deficit			R	L
	Uvula / tongue deviates			R	L
	Neglect			R	L
	Motor – Leg drift (lift each leg separately)			R	L
	Sensory – Face, arm, leg (touch each side)			R	L
	ANS: Sweating only one side				
Neck stiffness (cannot touch chin to chest; vomiting)					
PMH	<input type="checkbox"/> None <input type="checkbox"/> A-Fib/Flutter <input type="checkbox"/> AVM, tumor, aneurysm <input type="checkbox"/> Bleeding disorders <input type="checkbox"/> CAD/Prior MI/Heart/vascular dx <input type="checkbox"/> Carotid stenosis <input type="checkbox"/> Pregnant (or up to 6 wks post- partum) <input type="checkbox"/> Depression <input type="checkbox"/> Diabetes <input type="checkbox"/> Drug/Alcohol Abuse <input type="checkbox"/> Dyslipidemia <input type="checkbox"/> Family hx stroke <input type="checkbox"/> HF <input type="checkbox"/> HRT <input type="checkbox"/> HTN <input type="checkbox"/> Migraine <input type="checkbox"/> Obesity <input type="checkbox"/> Previous stroke <input type="checkbox"/> Previous TIA: <input type="checkbox"/> Previous intracranial surgery/bleed <input type="checkbox"/> Serious head trauma <input type="checkbox"/> *Prosthetic valve <input type="checkbox"/> PVD <input type="checkbox"/> Renal failure <input type="checkbox"/> Sleep apnea <input type="checkbox"/> Smoker/tobacco use				
	MEDS	<input type="checkbox"/> Anticoagulant use in 48 hrs: <input type="checkbox"/> warfarin/Coumadin <input type="checkbox"/> apixaban/Eliquis <input type="checkbox"/> argatroban <input type="checkbox"/> dabigatran/Pradaxa <input type="checkbox"/> desirudin/Privask <input type="checkbox"/> edoxaban/Savaysa <input type="checkbox"/> enoxaparin/Lovenox <input type="checkbox"/> fondaparinux/Arixtra <input type="checkbox"/> LMW heparin <input type="checkbox"/> lepirudin/Refludan <input type="checkbox"/> rivaroxaban/Xarelto Platelet inhibitors: <input type="checkbox"/> ASA <input type="checkbox"/> clopidogrel/Plavix <input type="checkbox"/> dipyridamole/Aggrenox <input type="checkbox"/> prasugel/Effient <input type="checkbox"/> ticagrelor/Brilinta <input type="checkbox"/> ticlodipine/Ticlid <input type="checkbox"/> Cocaine/other vasoconstrictors, e.g. amphetamines: PCP			
Destination options:					
Nearest hospital		Patient unstable			
Nearest SC (Primary or Comprehensive)		<input type="checkbox"/> Onset/LKW <3.5 hours with acute S&S of stroke			
Nearest Comprehensive SC		<input type="checkbox"/> Onset/LKW >3.5 hours with acute S&S of stroke AND <input type="checkbox"/> Travel time <15 min longer than to nearest PSC			
Stroke alert called to (OLMC hospital)				Time:	
Receiving hospital				Time:	

NWC EMSS STROKE SCREEN/STROKE ALERT DRAFT CHECKLIST WITH INSTRUCTIONS - 2019

Pt. name		DOB		Gender	
Witness name	Call back number:				
Chief complaint(s)					
Severe headache or seizure at onset?				Y	N
Head trauma at onset?				Y	N
EXAM – Assess for NEW ONSET S&S or Deficits - BE FAST Stroke Screen					
				✓ IF ABNORMAL	
B	BALANCE/Coord – Unsteady, fall? Finger to nose, rapid alternating movements, heel to shin; note ataxia; vertigo			R	L
Item tested: Balance	What we are looking for: New onset problems with balance, unsteadiness, tilting to one side, stumbling gait, one-sided incoordination of movements. ALSO evidence of fall / possible associated trauma mechanism.	Procedure for assessment: Inquire if they have had 1) any problems with balance, unsteadiness or 2) if they have fallen. DO NOT WALK THE PATIENT! Note if S&S are new or old (pre-existing)			
Item tested: Fine motor / coordination	What we are looking for: New onset ataxia, problems with coordination	Procedure for assessment: Have patient demonstrate: 1) touch their finger to their nose, then your finger on your outstretched hand, repeatedly; test both Rt and Lt sides. 2) bring fingers one by one to thumb of same hand in rapid succession; test on both sides. 3) rapidly slide the heel of one foot down the shin of the opposite leg; test on both sides. Note if dysfunction is new or old (pre-existing)			
Item tested: Vertigo	What we are looking for: New onset sensation that the room is spinning around the patient, even at rest.	Procedure for assessment: Inquire whether they have experienced or reported the sensation of the room spinning around them, and if so, was it when they were active, at rest, or both? Confirm that the sensation was not that of "light-headedness". Note if S&S are new or old (pre-existing)			
E	EYES: Vision changes: blurred, diplopia, loss of visual field; photophobia Eye position; ptosis. Horizontal gaze: gaze palsy or fixed deviation			R	L
Item tested: Change in vision	What we are looking for: New onset change in the patient's normal vision	Procedure for assessment: Inquire whether they have experienced new blurred, double, or any changes from normal (baseline) vision.			
Item tested: Visual fields	What we are looking for: New onset loss of vision in any of the 4 visual fields in either eye	Procedure for assessment: Position yourself level with and facing the patient, approx. arm's length away. Have pt cover one eye and focus on your face. Extend 1 or 2 fingers outward and wiggle in each of the upper and lower right and left visual fields. Patient identifies which quadrant the movement is in. Test separately on both eyes. Note if deficit is new or old.			
Item tested: Photophobia	What we are looking for: New onset discomfort or pain when eye is exposed to light	Procedure for assessment: Inquire whether the patient experiences sensitivity or discomfort when eyes open to light.			
Item tested: Ptosis	What we are looking for: Upper eyelid covers more of the iris than the opposite side or extends over the iris (appearance of drooping lid)	Procedure for assessment: Inspect for abnormal lid position from a position directly facing the patient			
Item tested: Eye position	What we are looking for: Asymmetrical horizontal and vertical alignment of eyes	Procedure for assessment: Inspect for symmetry from a position directly facing the patient. Assess for resting gaze palsy.			
Item tested: Extraocular movements	What we are looking for: Difference in range and or symmetry of eye movement, pain with movement, and or	Procedure for assessment: Instruct patient to fix their gaze on an object and follow its movement with their eyes only, keeping their head still. Move object laterally to both sides and vertically up and down from each left and right horizontal extreme			

	inability to move the eye (fixed eye position, usually to one side)	(movement should be in the shape of a capital H).	
F	FACE: Smile, show teeth; close eyelids, wrinkle forehead Note unilateral weakness/asymmetry:	R	L
Item tested: Facial symmetry	What we are looking for: New onset facial asymmetry and or abnormal /lack of movement of facial muscles and or eyelids	Procedure for assessment: Have patient demonstrate all 4 actions as describe above Stroke: Can wrinkle both sides of forehead Bell's Palsy: Cannot wrinkle both sides of forehead Note if deficit is new or old.	
A	Motor – ARM (close eyes; hold out both arms for 10 sec) Normal; Abnormal: drift to no effort against gravity	R	L
Item tested: Motor strength and symmetry of upper extremities	What we are looking for: New onset weakness, clumsiness, heaviness or paralysis of hand and or arm.	Procedure for assessment: Instruct patient to close eyes and lift both arms, palms up, in front of them, and hold for count of 10. Examiner may raise the patient's arms if patient does not or is not able to do so; observe for asymmetrical ability to hold, for drift, weakness, or no movement/flaccidity. Exam findings described: <ul style="list-style-type: none"> <u>Drift:</u> Limb holds 45-90° briefly, but drifts down before full count of 10, but does <u>not</u> hit bed/surface <u>Some effort against gravity:</u> limb cannot get to or maintain 45-90°; drifts down but has some effort. <u>No effort against gravity:</u> cannot lift limb on own, or limb promptly falls to surface when lifted by examiner <u>No voluntary movement:</u> limb is <u>paralyzed</u> 	
S	SPEECH (Repeat "You can't teach an old dog new tricks" or sing Happy Birthday (expressive/receptive aphasia); dysarthria, word substitution or retrieval deficits		
Item tested: Ability to form or articulate words (How they say it)	What we are looking for: New onset abnormality in phonation, pacing, or fluidity of speech due to muscle/tongue weakness that results in loss of speech articulation/clarity (dysarthria),	Procedure for assessment: Listen to and observe the patient as you ask them to repeat the phrase, "You can't teach an old dog new tricks" (Left brain). If they can't talk, have them sing, "Happy Birthday to You" (Right brain) Look for "slurred" speech	
Item tested: Speech content (What they say)	What we are looking for: New onset abnormality in the ability to communicate verbally, to "find" the correct words, to express ideas using organized speech, and or to understand what they read or hear.	When asking patient to repeat a sentence, are they doing it accurately? Are they saying the sentence correctly or are they transposing words? When answering your questions, do they make sense or are they speaking clearly but making no sense? Abnormal findings (wrong speech) described: <ul style="list-style-type: none"> <u>Aphasia:</u> complete absence of speech <u>Dysphasia:</u> difficulty finding the right words <u>Expressive aphasia:</u> garbled or mixed up words <u>Receptive aphasia:</u> words are clear but unrelated to questions or the subject matter 	
T	TIME last known well (military clock): <input type="checkbox"/> ≤ 3.5 hrs <input type="checkbox"/> >3.5 hr		
Not part of stroke screen, but important information	Level of consciousness: GCS: E V M		
	Paralyzed or other limiting factor		Not testable NT
	Orientation: Answers accurately: Name, age, month of year		
	Responds to commands: open/close eyes		
	Gross hearing – Note new onset unilateral hearing deficit		R L
	Say "Ah", palate rises, uvula midline Stick out tongue: remains midline (note abnormalities)		R L
	Neglect: one sided extinction (visual, auditory, sensory)		R L
	Motor – Lift leg. Normal; Abnormal: drift to no effort against gravity		R L
	Sensory – Focal changes or deficits (face, arms, legs)		R L
	ANS: Sweating only one side		R L
	Neck stiffness (cannot touch chin to chest; vomiting)		
PMH	<input type="checkbox"/> None <input type="checkbox"/> A-Fib/Flutter <input type="checkbox"/> AVM, tumor, aneurysm <input type="checkbox"/> Bleeding disorders <input type="checkbox"/> CAD/Prior MI/Heart/vascular dx		

	<input type="checkbox"/> Carotid stenosis <input type="checkbox"/> Pregnant (or up to 6 wks post- partum) <input type="checkbox"/> Depression <input type="checkbox"/> Diabetes <input type="checkbox"/> Drug/Alcohol Abuse <input type="checkbox"/> Dyslipidemia <input type="checkbox"/> Family hx stroke <input type="checkbox"/> HF <input type="checkbox"/> HRT <input type="checkbox"/> HTN <input type="checkbox"/> Migraine <input type="checkbox"/> Obesity <input type="checkbox"/> Previous stroke <input type="checkbox"/> Previous TIA: <input type="checkbox"/> Previous intracranial surgery/bleed <input type="checkbox"/> Serious head trauma <input type="checkbox"/> *Prosthetic valve <input type="checkbox"/> PVD <input type="checkbox"/> Renal failure <input type="checkbox"/> Sleep apnea <input type="checkbox"/> Smoker/tobacco use	
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Destination options:		
Nearest hospital	Patient unstable	
Nearest SC (Primary or Comprehensive)	<input type="checkbox"/> Onset/LKW <3.5 hours with acute S&S of stroke	
Nearest Comprehensive SC	<input type="checkbox"/> Onset/LKW >3.5 hours with acute S&S of stroke AND <input type="checkbox"/> Travel time <15 min longer than to nearest PSC	
Stroke alert called to (OLMC hospital)		Time:
Receiving hospital		Time beyond PSC to CSC:
Comprehensive SCs	<input type="checkbox"/> ABMC <input type="checkbox"/> ALGH <input type="checkbox"/> NCH <input type="checkbox"/> Res	

Left cerebral hemisphere L MCA involvement	Right cerebral hemisphere R MCA involvement
Aphasia: expressive/ receptive or mixed Eyes: deviate to left R visual field deficit R hemiparesis/hemiplegia R hemisensory loss	Neglect (L hemi-inattention) Eyes: deviate to R L visual field deficit L hemiparesis/hemiplegia L hemisensory loss
Lacunar Syndromes	
<ul style="list-style-type: none"> Pure motor Pure sensory Clumsy hand/dysarthria Ataxic hemiparesis Multi-infarct dementia (Cesario & Szost, 2013) 	
Brainstem or posterior stroke	
<ul style="list-style-type: none"> 5 Ds: Dizziness, Diplopia, Dysarthria, Dysphagia (chewing & swallowing), Dystaxia (incoordination) Severe vertigo; nausea, vomiting; Visual field loss; gaze palsies Partial or complete loss of hearing May have difficulty breathing Hallmark: Crossed findings; same side (ipsilateral) ataxia Cranial nerve deficits (ipsilateral) Motor/sensory deficits (contralateral); decreased pain and temperature sensation; loss of 2 point discrimination Clinical findings: asymptomatic to comatose 	

GLASGOW COMA SCALE : Do it this way

Institute of Neurological Sciences NHS Greater Glasgow and Clyde



CHECK

For factors Interfering with communication, ability to respond and other injuries



OBSERVE

Eye opening , content of speech and movements of right and left sides



STIMULATE

Sound: spoken or shouted request
Physical: Pressure on finger tip, trapezius or supraorbital notch



RATE

Assign according to highest response observed

Eye opening

Criterion	Observed	Rating	Score
Open before stimulus	✓	Spontaneous	4
After spoken or shouted request	✓	To sound	3
After finger tip stimulus	✓	To pressure	2
No opening at any time, no interfering factor	✓	None	1
Closed by local factor	✓	Non testable	NT

Verbal response

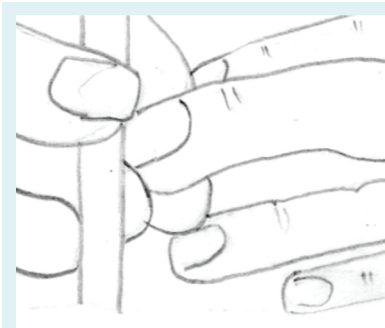
Criterion	Observed	Rating	Score
Correctly gives name, place and date	✓	Orientated	5
Not orientated but communication coherently	✓	Confused	4
Intelligible single words	✓	Words	3
Only moans / groans	✓	Sounds	2
No audible response, no interfering factor	✓	None	1
Factor interfering with communication	✓	Non testable	NT

Best motor response

Criterion	Observed	Rating	Score
Obey 2-part request	✓	Obeys commands	6
Brings hand above clavicle to stimulus on head neck	✓	Localising	5
Bends arm at elbow rapidly but features not predominantly abnormal	✓	Normal flexion	4
Bends arm at elbow, features clearly predominantly abnormal	✓	Abnormal flexion	3
Extends arm at elbow	✓	Extension	2
No movement in arms / legs, no interfering factor	✓	None	1
Paralysed or other limiting factor	✓	Non testable	NT

Sites For Physical Stimulation

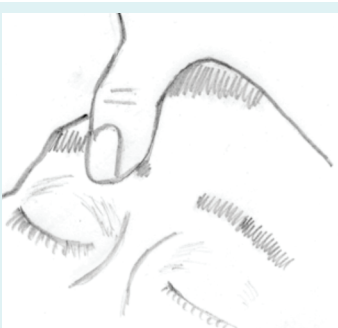
Finger tip pressure



Trapezius Pinch



Supraorbital notch



Features of Flexion Responses

Modified with permission from Van Der Naalt 2004
Ned Tijdschr Geneeskd

Abnormal Flexion

Slow Stereotyped
Arm across chest
Forearm rotates
Thumb clenched
Leg extends



Normal flexion

Rapid
Variable
Arm away from body