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BENEFITS AND LIMITATIONS OF VOJTA'S APPROACH OF REFLEX LOCOMOTION

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Presentation for International conference
"**Neurorehabilitation Principles**" November 14.-15.2008;
Organized by Neurology Clinic & Clinic of Rehabilitation
3rd Medical Faculty, Charles University,
University Hospital Kralovske Vinohrady,
Prague, Czech Republic

HOW RL WORKS?

- By specifically defined proprioceptive afferent stimulation, a specific CNS motor program is addressed.
- Stimulation:
the initial body position “attitude”
+ stimulation of specific localized zones

HOW RL WORKS?



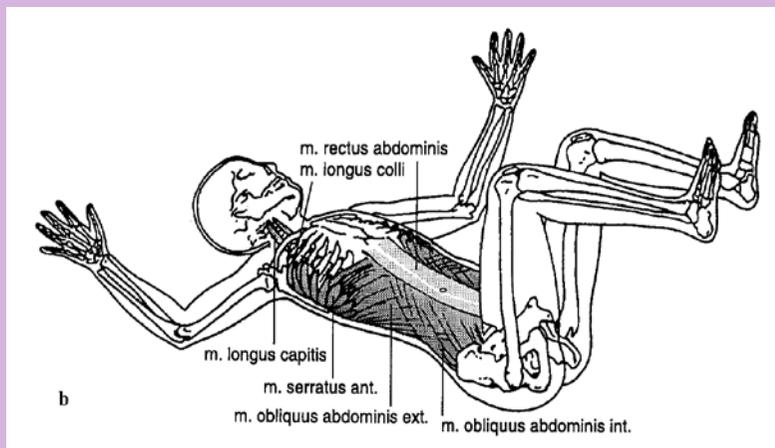
- ◉ Repeated stimulation of zones + Time and space summation of zones:
- ◉ Partial patterns \longrightarrow Global motor patterns
patterns \longrightarrow fixed as parts of **spontaneous motor behavior**
 \longrightarrow Ideal motor patterns

WHAT DO WE EVOKE BY RL?

- “Coordination complexes“ (**global locomotor patterns**)
- Automatic - not under voluntary control, “Subconscious” motor activity is stimulated
- No need for active co-operation by the patient
- Involve the basic elements “**partial patterns**” of physiological motor behavior: this is specific only to the human species

PRINCIPLE OF TREATMENT

- Evoking ipsilateral pattern



REFLEX TURNING



PRINCIPLE OF TREATMENT

- Evoking contralateral pattern

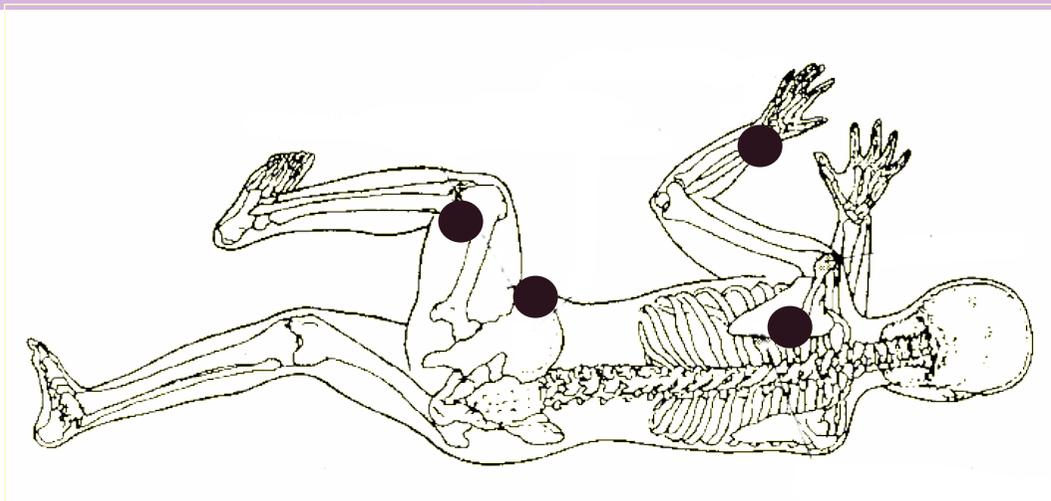


REFLEX CREEPING



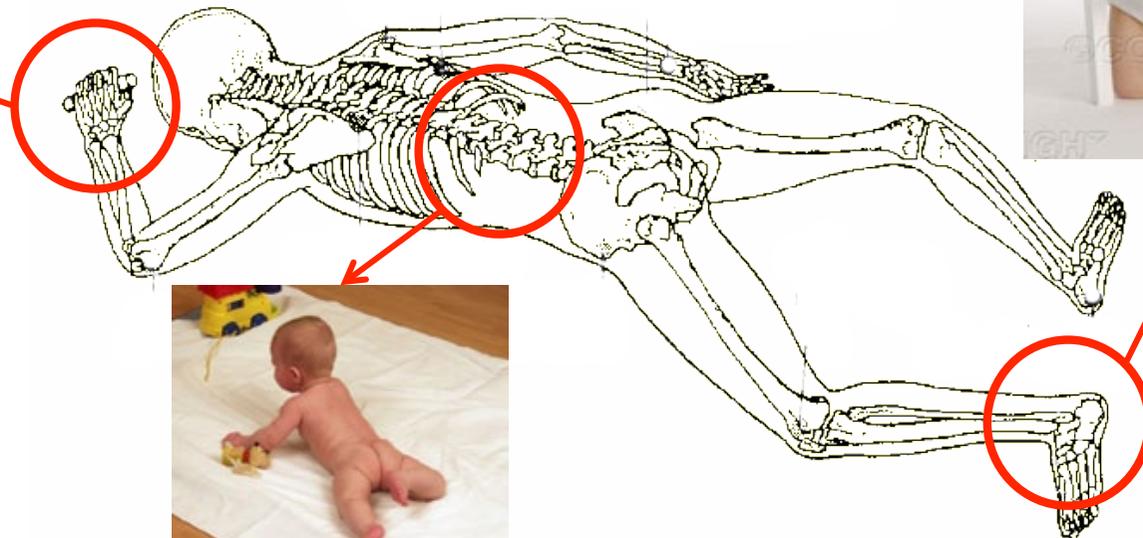
REFLEX TURNING AND CREEPING PATTERNS ORIGIN

- Both patterns are „artificial patterns“ and they are not present in its integrity in postural and motor development
- This is due to the fact that patterns can be elicited only from certain position and by stimulation from certain zones



REFLEX TURNING AND CREEPING PATTERNS

- Reflex creeping is not present in human development of locomotion but it contains partial patterns which are present in child ontogenesis



REFLEX TURNING AND CREEPING PATTERNS

- When comparing reflex turning and spontaneous turning there are also some different components - initiation of turning, final end-position.



BENEFITS OF RL IN TREATMENT

RL is the universal rehabilitation method which address:

- Motor function
 - stabilization function, supporting functions, “phasic” movements, oro-facial functions, deep paraspinal muscles
- Sensory function
 - stereognosis, sensation
- Respiratory function
 - diaphragm, abdominals
- Bowel and bladder function, sphincters function, pelvic floor

RL IS FREQUENTLY INDICATED IN:

- Cerebral palsy (central co-ordination disorder)
- *Peripheral nerve palsy*
- *Hemiparesis following brain stroke*
- *Spinal cord injury*
- *Multiple sclerosis*
- *Myopathy*
- Poor posture, scoliosis
- *Spinal pain, nerve root involvement*



ELECTROMYOGRAPHY AND KINESIOLOGICAL ANALYSIS OF VOJTA'S THERAPEUTICAL PRINCIPLE

Pavlů, D., Vele F., Havlíčková, L.

Rehabilitace a fyzikální lékařství, Vol. 7, No. 2, 2000

(Czech Journal of Rehabilitation and Physical Therapy)

- 11 healthy subjects (ages 21-25 years) underwent 2 - 5 sessions of Vojta RL for about 30 minutes
- SEMG measurement was used in Reflex turning phase 1 for all sessions



Electromyographic and kinesiological analysis of Vojta's
therapeutical principle. **Pavlů, D., Věle F., Havlíčková, L. (2000).**

RESULTS:

- Responses usually appeared after 3rd to 5th RL session
- Responses were elicited quicker after a few session of RL
- Responses usually initiated by change of respiration, & a deeper breath, followed by
- Responses in trunk muscles activation with a tendency towards trunk rotation

Electromyographic and kinesiographical analysis of Vojta's
therapeutical principle. **Pavlů, D., Věle F., Havlíčková, L. (2000).**

RESULTS:

- ◉ Legs had a tendency to bend in hips and knees
- ◉ Arms had tendency to lift, elbows slightly bend, wrists dorzally flexed
- ◉ Level of responses elicited was different in each individual but the characteristics (aim) of the response was the same and led the individual towards turning



THE VOJTA APPROACH IN ADULT PATIENTS

Husárová, R. *Rehabilitacia, Vol 42, No 3, 2005*
(*Slovak Journal of Rehabilitation*)

- 30 hemiparetic patients:
 - 16 male (mean age 61.5) and 14 females (mean age 64)
- Treatment of Vojta RL 2 - 3 times a day for approximately 15 days stay in hospital
- Evaluation
 1. Spasticity
 2. Patient ability of co-operation
 3. Articulation
 4. Gait
 5. Psychological state

RESULTS:



- ⊙ 87% gait improvement
- ⊙ 90% decrease in spasticity
- ⊙ 83% improvement in speech/articulation
- ⊙ 90% improvement in psychological state

BENEFITS IN TREATMENT OF HEMIPARETIC PATIENTS



- ◉ Addresses the brain plasticity
- ◉ Addresses the ability of stereognosis and deep sensation
- ◉ Evokes the global pattern of movement (coordination complexes) to influence complex motor movement such as gait, reaching, grasping and other activities of daily living

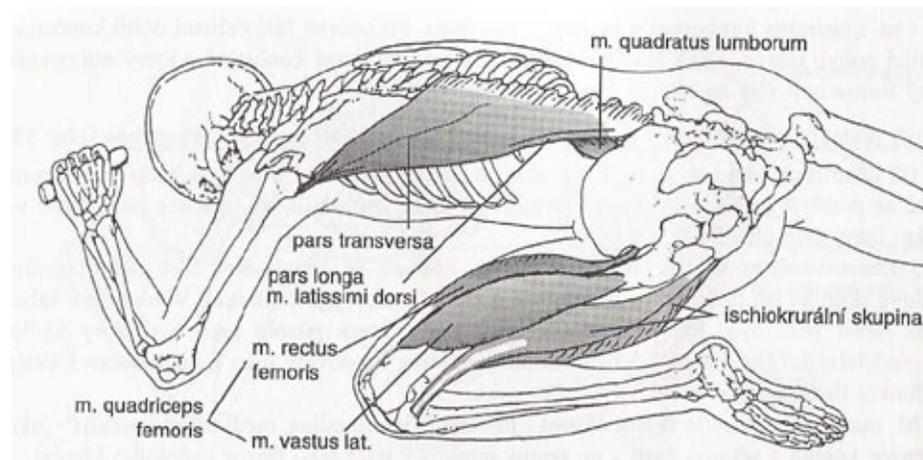
BENEFITS IN TREATMENT OF SPINAL CORD INJURY PATIENTS

- ◉ Can be used in early stages after spinal cord injury (after spinal shock)
- ◉ Motor function stimulation - supporting natural neuroplasticity
- ◉ Positive influence on respiratory function - pneumonia prevention



BENEFITS IN TREATMENT OF SPINAL CORD INJURY PATIENTS

- Positive influence on bladder function - prevention of inflammation
- Positive influence on bowel function - prevention of constipation



ALTERNATING TREADMILL-VOJTA- TREADMILL THERAPY IN PATIENTS WITH MULTIPLE SCLEROSIS WITH SEVERELY AFFECTED GAIT

G. Laufens, W. Poltz, G. Reimann, F. Schmiegelt, S. Stempski
Phys Rehab Kur Med 2004; 14: 134-139

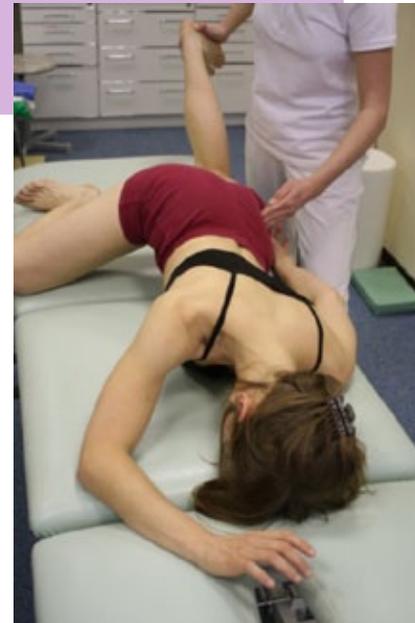
- 21 MS patients had daily therapy sequence TT-VT-TT
- On the 2nd 12th and 22nd day the therapy sequence changed to VT-TT-TT
- Evaluation
 - gait parameters
 - SEMG during Vojta therapy
 - Neurological examination - disability status, cerebellar function, spasticity and muscle strength

RESULTS

- ◉ SEMG activity in the VT was far greater when TT took place before VT.
- ◉ When sequence TT-VT-TT was chosen, distance walked during the second TT was significantly longer than in the first TT.
- ◉ Gait velocity and stride length improved significantly ($p < 0.0001$)

RESULTS

- ◉ 16 of 19 neurologically examined patient improved by 0.25 - 1 level of disability status
- ◉ Noticeable improvements in cerebellar function (by 68,4%) and muscle strength of more affected leg (by 78.9%)



IMMEDIATE EFFECT OF VOJTA RL ON SPIROGRAPHY PARAMETERS IN PATIENT WITH MYOPATHY - CASE STUDY (ŠAFÁŘOVÁ, ŠULC, 2007)

- ◉ 44 years old woman with proved facial-scapular-humeral type of myopathy
- ◉ Waddling gait, slow progression of legs weakness
- ◉ Atrophy of peri-scapular muscles, weak arm abduction, flexion, elbow flexion
- ◉ 2006 inflammation of airways - decrease of breath volumes

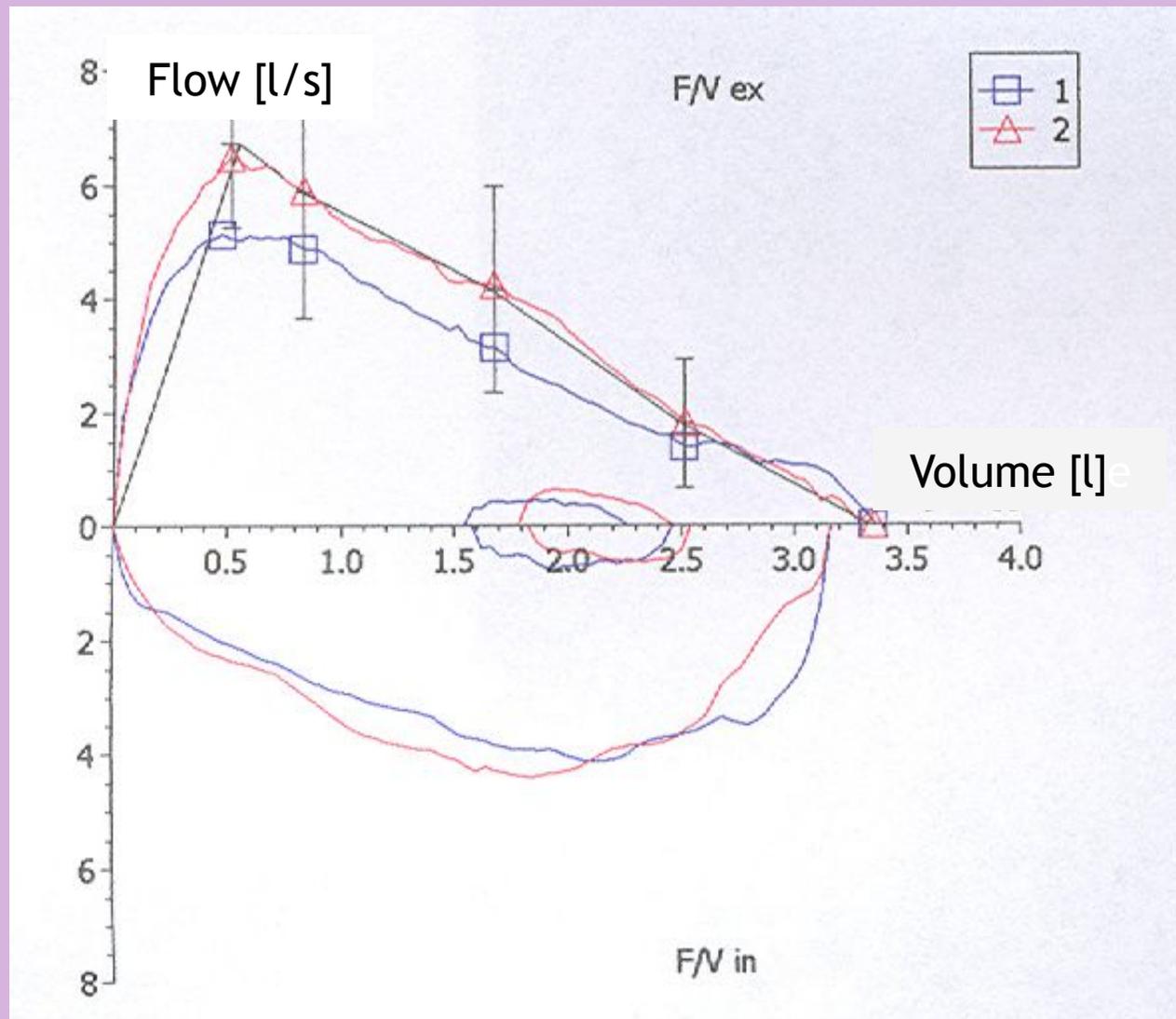
REFLEX TURNING 2ND PHASE



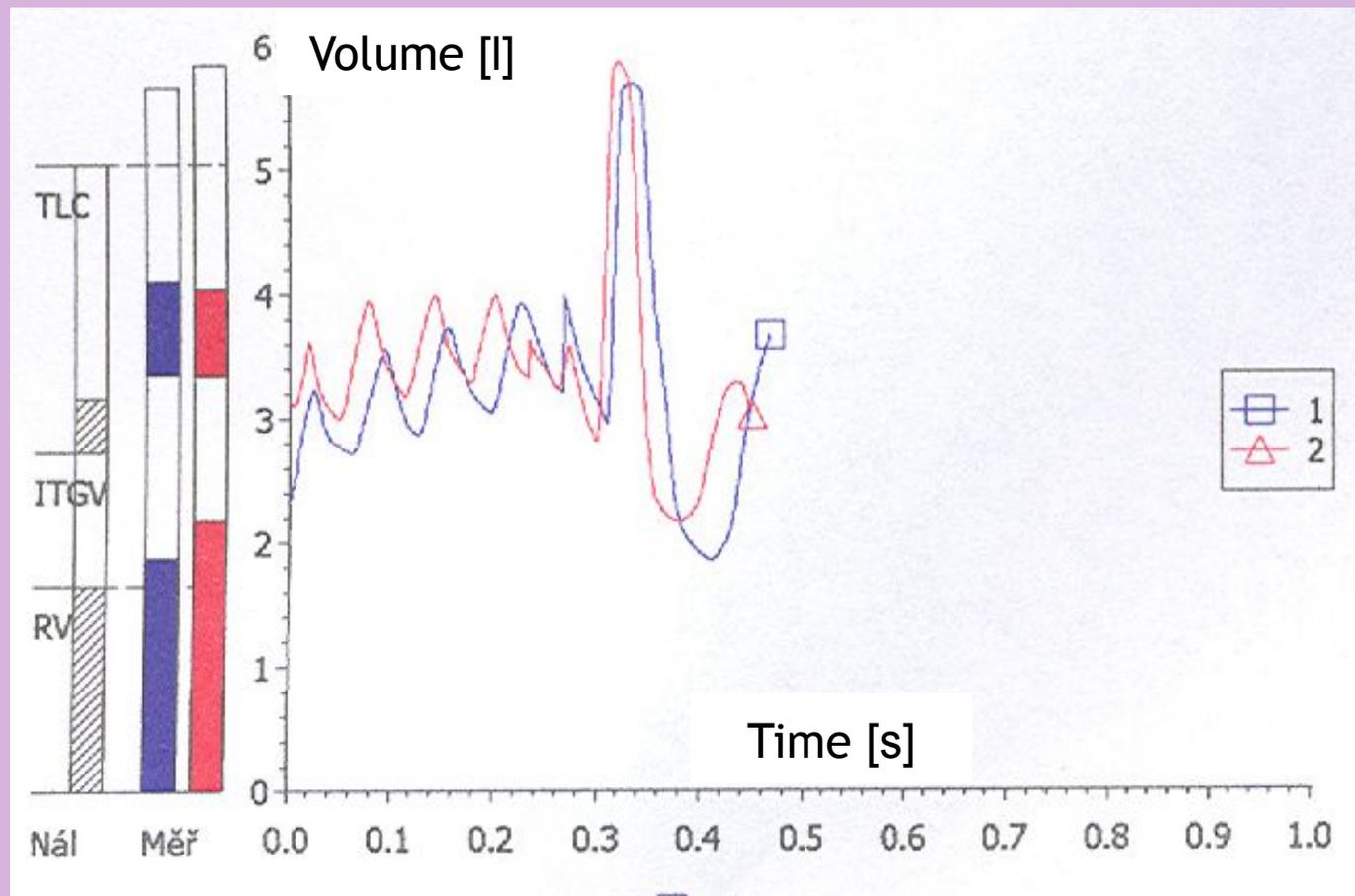
REFLEX TURNING 4TH B PHASE



SPIROGRAPHY RESULTS



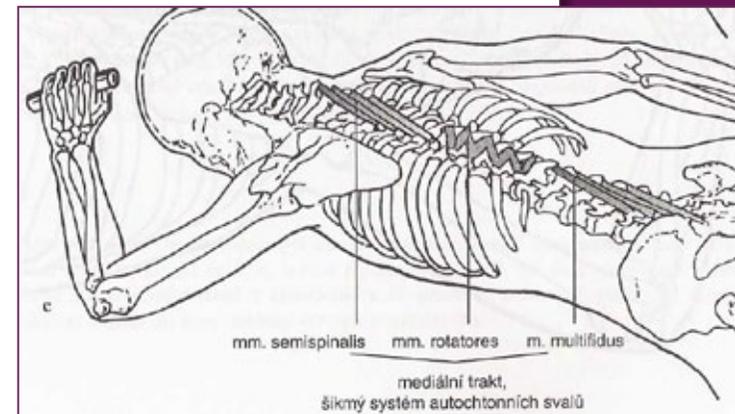
SPIROGRAPHY RESULTS



PRACTICAL EXPERIENCE WITH VOJTA 'S RL IN PATIENT WITH LBP

Beranová, B, Kovačiková, V, Kutín, M. (2006)

- Offers GP for up-righting the spine and pelvis on arms with C and T spine straightening.
- Influencing deep paraspinal muscles and thus decreasing pressure on the disk
- Create spine stabilization by evoking **diaphragm, abdominals and pelvic floor co-activation**



**VERIFICATION OF EFFECT
OF REFLEX LOCOMOTION
ACCORDING TO VOJTA IN
PATIENTS WITH
PERIPHERAL FACIAL
PALSY**

Martin Dvořák, P.T,
Petra Valouchová, P.T. Ph.D.
(2007)

AIM OF THE RESEARCH:

- To verify the effect of Reflex locomotion according to Vojta in patients with peripheral facial palsy by surface electromyography
- Immediate effect was evaluated by:
 - 1. SEMG
 - 2. functional tests of mimic muscles
 - 3. subjective response of the patient

PATIENT'S GROUP CHARACTERISTICS

- 7 patients with peripheral facial palsy due to inflammation
- 4 men and 3 women age from 9 - 70 (mean age 31 years)
- All patient underwent neurological examination which was diagnosed as peripheral facial palsy

SURFACE EMG MEASUREMENT

- 16 channel surface electromyograph Telemyo-Noraxon with telemetric signal transfer
- Software MyoClinical (version 2.10)



SEMG MEASUREMENT



- two electrodes were placed on cleaned and scrubbed skin above muscular belly and parallel to the muscular fibres
- Measured muscles:
 - m. frontalis dexter et sinister,
 - m. orbicularis oris dexter et sinister
 - mm. suprahyoidei dexter et sinister

SEMG PROCESSING

- ◉ Sampling frequency 100Hz
- ◉ Full rectification
- ◉ Smoothing RMS - 100 ms
- ◉ Filtration from frequencies above 500Hz
- ◉ Data collection - mean amplitude, peak amplitude, difference in % from side to side

SEMG MEASUREMENT

- 1) **quiet supine lying**
- 2) **eye brows elevation in supine**
- 3) **eyes closing**
- 4) **forced eyes closing**
- 5) **mouth puckering up in supine**
- 6) **showing teeth in supine**
- 7) **liquid swallowing (by stick) in sitting**

RL ACCORDING TO VOJTA - REFLEX TURNING 1ST PHASE

Initial position:



Stimulation zone - “breast zone”

REFLEX TURNING 1ST PHASE

Stimulation points:

proc. mastoideus on occipital side

angulus mandibulae

os zygomaticum - laterally to the eye lid

m. mylohyoideus - stimulation of swallowing

REFLEX LOCOMOTION TREATMENT

- REFLEX TURNING 1ST PHASE

- Total time of stimulation was 20 minutes - 10 minutes each side
- Side of facial palsy was treated first as occipital side

PATIENT'S SUBJECTIVE CHANGES AFTER RL TREATMENT:

Voluntary movement:

- 5 patients reported improvement
- in 1 no change
- 1 became worse

Articulation:

- 6 patients improved (in 4 patients improvement was observed visually by the therapist)
- in 1 no change

Swallowing:

- improvement reported all tested patients

EVALUATION OF PHOTOGRAPHS

Lagophthalmus:

- in 2 patients disappeared completely
- in 3 decreased
- in 1x decreased during forced eyes closing

Inability to close the mouth when pucker up:

- This was observed in two patients and in both patient improved after RL treatment

EVALUATION OF PHOTOGRAPHS

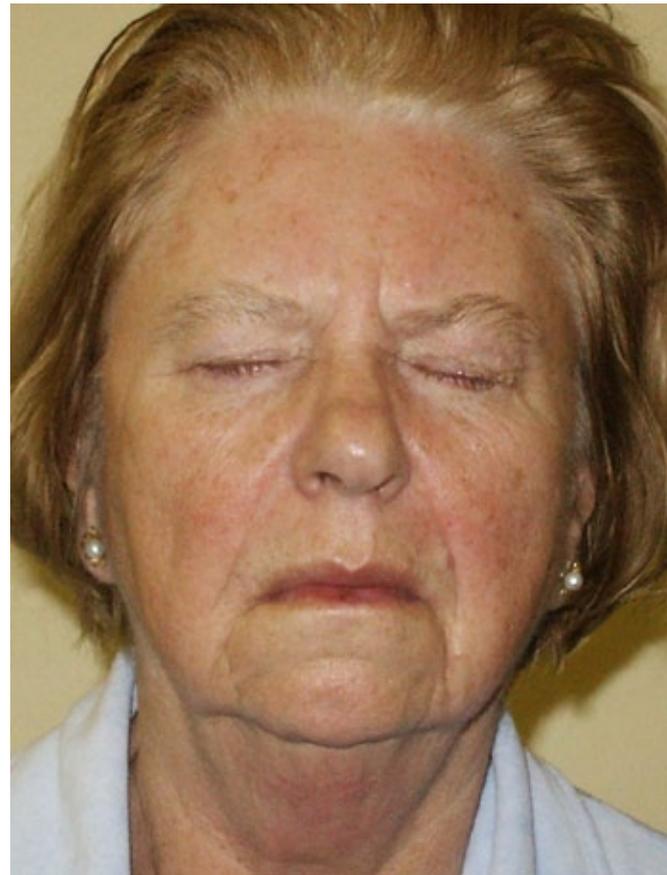
Synkinesis:

- in 2 p. eye closing disappeared during mouth puckering up
- in 2 decreased lip corner depression during forced eyes closing
- In 1 decreased platysma tension during eye closing

PATIENT WITH BILATERAL FACIAL Palsy



Before RL

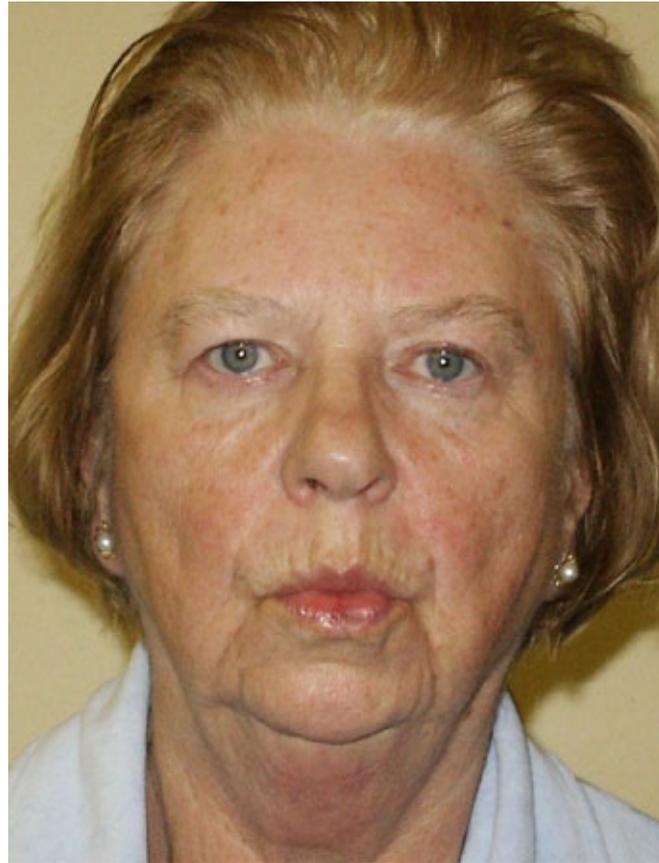


After RL





Before RL



After RL



RIGHT SIDE FACIAL PALSY



Before RL



After RL



RIGHT SIDE FACIAL PALSY



Before RL



After RL



STUDY CONCLUSIONS

SurfaceEMG:

- positive effect of RL considering improvement in symmetry of muscular activity was measured in less than 50% of cases
- This could be due to onset of muscular fatigue after long period of RL treatment

STUDY CONCLUSIONS:

Patient´s subjective self-evaluation:

- Vojta´s approach of RL (reflex turning 1) had *mostly positive effect on voluntary movement, articulation and on swallowing*

Comparative evaluation of photos before and after

RL:

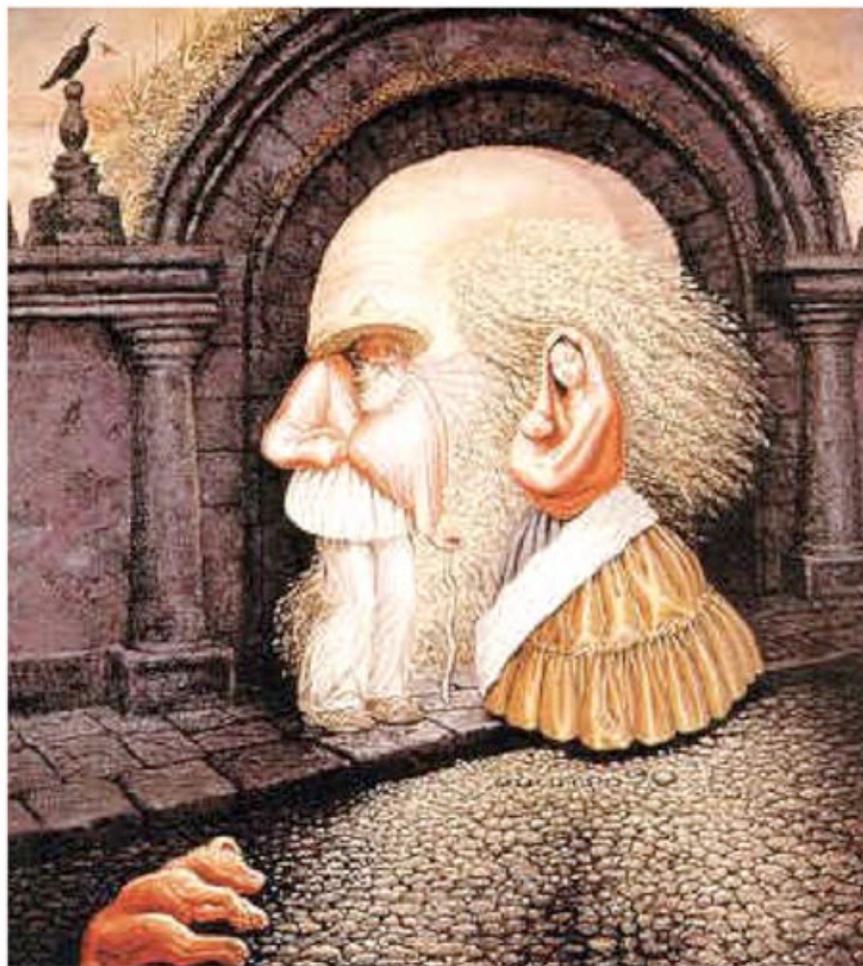
- *RL had a significantly positive influence on lagophthalmus, synkinesis and on disability of mouth closing during puckering up*

GENERAL CONCLUSIONS FOR RL IN TREATMENT

- RL is approach which can be used in order to activate muscles which are difficult for patient to activate voluntarily
- Can be used prior to voluntary exercise in order to facilitate correct muscular synergies and promote these synergies into movement patterns
- Should be used in adult patients besides the other techniques and methods (facilitation, inhibition, strengthening, stretching, mobilization)

GENERAL LIMITATIONS OF RL

- ◉ Complete lesion of spinal cord - ?
- ◉ Lack of neuroplasticity
- ◉ Lack of patient or family members cooperation
- ◉ Lack of expected (anticipatory) responses
- ◉ Lack of skillfull and well trained therapists



THANK
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ATTENTION!

www.vojta.com

<http://www.vojtovaspolecnost.cz/onas.php>

www.rl-corpus.cz

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